Masters in Disaster Management

1. In general biodiversity is
A) Fairly evenly spread among all of the major groups animals and plants
B) Accurately understood by most people
C) Widely documented, with nearly all estimated described by science
D) Declining in India and around the world

2. A food chain consists of
A) Producers, consumers, decomposers
B) Producers, carnivores, decomposers
C) Primary producer, herbivores, carnivores
D) Producers, primary consumers, carnivores,

3. A population that is at equilibrium is
A) Experiencing a slow rate of growth
B) Staying at about the same size
C) Slowly losing size because of decrease in environmental resistance
D) Has most likely just lost a key predator

4. A raccoon spends its week eating raspberries, grain, eggs and grasshoppers. Raccoons are therefore
A) Carnivores B) Omnivores C) Herbivores D) Producers

5. You sail in your boat, passing the alligators, turtles and tall marsh grasses on your journey through a forest. This magnificent ecosystem is one of the most famous examples of
A) An Estuary B) A Lake C) A Wetland D) A freshwater stream

6. Biomes with less than 25 centimetres of rain a year are
A) Very warm B) Very cold
C) Covered with coniferous trees D) Deserts

7. A bison grazing on grasses growing in a meadow represents
A) A consumer eating producer B) A producer eating a consumer
C) Two consumers D) Two producers

8. Fog is a component of the
A) Hydrosphere B) Biosphere C) Atmosphere D) Lithosphere

9. Heavy metals can quickly moved through ecosystems because
A) They are soluble in water
B) Quickly dissolve in the fats of animals
C) Quickly become incorporated into sugars and starch
D) Easily clump together and bind rightly to soil compound

10. Organisms that feed on the bodies of dead organisms are known as

A) Primary consumers B) Herbivores
C) Decomposers D) Omnivores

11. Populations of species that occupy the same Geographic area and interact with each others are collectively called
A) An ecosystem B) A community C) A drift D) A biosphere

12. Sustainable populations
A) Are often near their carrying capacity
B) Have exceeded their biotic potential
C) Have grown beyond all types of environmental resistance
D) Are characterized by high emigration and low recruitment

13. The ability of an ecosystem to replenish itself leads to
A) Sustainability
B) Decreasing consumptive use
C) The conversion of ecosystem capital from one form to another
D) Increasing natural resources but declining ecosystem capital

14. The graphical representation of the interrelation of producer and consumer in an ecosystem is termed as
A) Ecological Niche B) Ecological pyramid
C) Trophic levels D) Food web

15. Importance of ecosystem lies in
A) Transfer of food B) Flow of energy
C) Cycling of materials D) Both B and C

16. The interdependence of the living organisms among themselves and their environment is called
A) Ecology B) Ecosystem C) Biology D) Anthology

17. The population of a particular species that an ecosystem can sustain indefinitely is called its
A) Habitat distribution B) Climax community
C) Carrying capacity D) Environmental range

18. The sequence of organisms which feed on one another for their survival is known as
A) Passage of nutrients from one organism to other
B) Food chain
C) Trophic level
D) Biodiversity

19. In Kolkata, major air pollution is caused by
A) Fungal spores B) Algae C) Hydrocarbons D) Sulphur Dioxide

20. The weather office predicts 'depression' over a certain area. It means:
A) Cloudy skies
B) Atmospheric pressure in that area is lower than that in the surrounding areas
C) Heavy weather causing a feeling of depression
D) Low atmospheric pressure over a large area

21. Burning fossil fuels in a low oxygen environment will most likely produce
A) Carbon monoxide B) Hydrogen peroxide
C) Sulphuric acid D) Radon gases

22. DDT is a
A) Biochemical pollutant B) Biodegradable pollutant
C) Non-Biodegradable Pollutant D) Non pollutant

23. Most of the air pollution that we experience is located in the
A) Mesosphere B) Thermosphere C) Stratosphere D) Troposphere

24. The largest variety of plants and animals is found in the
A) Temperate forests B) Monsoon forests
C) Tropical forests D) Tropical grasslands

25. Ozone Layer can be destroyed by pollutants such as
A) Halons and CFCs B) Sulphur dioxide
C) Carbon monoxide D) Hydrocarbons and nitrogen oxides

26. Deep underground reservoirs of water are called
A) Eutrophic zones B) Aquifers
C) Non phototrophic zones D) Seismic buffers

27. Most of the water on Earth is found in
A) Lakes and rivers B) Polar ice caps C) Glaciers D) Oceans

28. The greatest threat to groundwater supplies are
A) Groundwater pollution and depletion
B) Global warming and the construction of dams
C) Increased Evaporation And Increased Precipitation
D) Evapo-transpiration and runoff

29. The largest reserves of freshwater on earth are found in
A) Lakes and wetlands B) Rivers and groundwater
C) Aquifers D) Polar ice caps and glaciers

30. Species with very restricted distribution over relatively small ranges is called
A) Endangered species B) Extinct species
C) Endemic species D) None of the above

31. The concept of biodiversity hotspots is given by

A) F.P. Odum B) Norman Myers C) James lovelock D) Rachel Carson

32. If you travel through the Himalayas, you are likely to see which of the following plants naturally growing there

1. Oak
2. Rhododendron
3. Sandalwood

select the correct answer using the codes given below

A) 1 and 2 B) Only 3 C) 1 and 3 D) All of these

33. The most important strategy for the conservation of biodiversity together with traditional human life is the establishment of

A) Biosphere Reserves B) Botanical gardens
C) National parks D) Wildlife sanctuaries

34. In which of the following states is Lion tailed macaque found in its natural habitat

1. Tamil Nadu
2. Kerala
3. Karnataka
4. Andhra Pradesh

Select the correct answer using the codes given below

A) 1, 2 and 3 B) Only 1 C) 1, 3 and 4 D) All of these

35. Which one of the following is not a site for in situ method of conservation of flora?

A) Biosphere reserve B) Botanical garden
C) National Park D) wildlife Sanctuary

36. Diversity and productivity of the coral reef is most similar to that of.

A) Desert environments B) A natural prairie
C) Tropical rainforests D) A river system

37. Although the Green Revolution has greatly reduced world hunger and malnutrition, it has

A) Doubled the amount of land used to raise crops
B) Not significantly increased the productivity of modern agriculture
C) Required high levels of fertilizers and pesticides
D) Contributed significantly to the destruction of ozone layer

38. Around the world, the greatest health risk to children under the age of 5 is

A) Infectious disease B) Lack of immunizations
C) Being underweight D) The loss of both parents

39. Global climate change may increase the number of worldwide famines by

A) Shifting the types of crops grown in a region
B) Causing the spread of infectious disease

C) Increasing the number of droughts in the world
D) Requiring the use of alternate forms of energy

40. In the subcontinent of India the region frequently affected by tropical cyclone is
A) Gujarat coast
B) Coromandel Coast
C) Konkan Coast
D) Malabar Coast

41. The Vale of Kashmir is the only level strip of land in the Himalayas, which river has laid its deposits to form this land
A) Ravi
B) Satluj
C) Beas
D) Jhelum

42. In the context of CO emission and global warming, what is the name of a market driven device under the UNFCC that allows developing countries to get funds incentive from the developed countries to adopt better technologies that reduce Greenhouse gas emissions
A) Carbon footprint
B) Carbon credit rating
C) Clean development mechanism
D) Emission reduction norm

43. From which one of the following did the concept of Carbon Credit originate
A) Earth Summit
B) Kyoto Protocol
C) Montreal Protocol
D) G8 Summit

44. The rate of energy at consumer's level is known as
A) Net primary productivity
B) Total primary productivity
C) Primary productivity
D) Productivity

45. What is not an external factor to control an ecosystem
A) Altitude
B) Microbes
C) Type of soil
D) Topography

46. Which of the following region is the highest seismic domain in India
A) The Deccan Plateau
B) The Western Ghats
C) The Indo Gangetic Plain
D) The Himalayas

47. Which of the following is the first National Park established in India
A) Kanha National Park
B) Gir National Park
C) Hazaribagh National Park
D) Jim Corbett National Park

48. How do the 'western disturbances' affect the crops in north India?
A) They cause heavy damage to the standing crops
B) They bring in locusts which destroy the crops
C) They are beneficial to the crops by causing winter rain
D) They help in keeping the plants warm to some extent in winter

49. Which of the following is responsible for hardness of water
A) Sodium and chloride ions
B) Potassium and nitrite ions
C) Calcium and magnesium ions
D) Strontium and nitrate ions

50. In which of the following years was London smog observed
A) 1755 B) 1952 C) 1972 D) 1970

51. Sahyadri mountains refer to
A) Western Ghats B) Eastern Ghats C) Satpura Range D) Siwaliks

52. In 2007, heavy rains contributed to an outbreak of Cholera in children living in war torn Iraq. What was the likely cause of the spread of this disease?
A) Pollution of waterways by raw sewage
B) Outbreaks of mosquitoes
C) Lack of protection from the rain caused children to be very cold
D) Rain soaked roads prevented the distribution of much needed food supplies

53. Most of the weather of the world is based upon changes in the moisture, pressure, and/or temperature of the:
A) Mesosphere B) Thermosphere C) Stratosphere D) Troposphere

54. Nutrients essential for plant growth are returned to the soil by
A) Decomposers B) Herbivores C) Producers D) Carnivores

55. Oral Rehydration Therapy (ORT) is the process of:
A) Continuous replacement of essential body fluids and salt in proper quantities during the attacks of diarrhea
B) Providing mineral water and fruit juice by railway during journey
C) Taking saline injection
D) None of the above

56. Take a big breath of air, you have mostly inhaled
A) Nitrogen B) Oxygen C) Carbon dioxide D) Water

57. The Chemistry Professor warned the students that you never store acids in metal containers because acids demonstrate the high level of
A) Ignitability B) Toxicity C) Reactivity D) Corrosivity

58. The fossil fuels are considered non renewable sources of energy because
A) Their formation is so slow
B) They release carbon dioxide when they are burnt
C) People are cutting down too many forests to allow trees to turn into coal
D) Carbon dioxide levels in the atmosphere are too low to allow fossil fuels to form

59. The greatest Public Health concerns about the H5N1 bird flu virus is that it will
A) Be spread from one bird to another B) Be spread from Birds to people
C) Spread out of the country of Australia D) Spread from person to person

60. In 1984, the worst gas tragedy in India took place in

A) Bengaluru B) Mumbai C) Bhopal D) Patna

61. Ramsar Convention, 1971 aimed at the conservation of
A) Waste land B) Wetlands C) Desert D) All of these

62. The term eutrophication stands for
A) The pollution of oceans by seepage of crude oil
B) Pollution of water by invading plants
C) Climax vegetation and succession
D) A body of water rich in nutrients and supporting a dense plant population

63. The term Green-Shield stands for
A) Boreal forests B) Equatorial forests
C) Estuarine ecosystem D) Mangrove forests

64. The agenda 21 of the Earth Summit was about
A) Climate change
B) Biodiversity conservation
C) Earth Charter
D) Sustainable development

65. Which one of the following is not a suitable technique to control soil erosion in a desert or semi desert area
A) Afforestation B) Contour ploughing
C) Stubble mulching D) Terracing

66. Consider the following statements and select the correct answer using the code given below
1. The arrival of Tsunami in the coastal zone is heralded by sudden recession of seawater
2. Tsunami sometimes generate specular waves called as edge waves which move back and forth and parallel to the coast

A) Only 1 is correct B) Both 1 and 2 are correct
C) Only 2 is correct D) Neither 1 nor 2 is correct

67. The term regolith stands for
A) A blanket of soil and loose rock fragments overlying Bedrock
B) A large body of intrusive igneous rock
C) Rock that commonly have high permeability
D) A depositional landform in a desert

68. The term Erg stands for
A) High altitude desert B) Rocky desert C) Semi desert D) Sandy desert

69. The term cryosphere stands for
A) The area in which the gravitational force of the moon and the sun is predominant
B) The region below the lithosphere rocks are less rigid

C) The shadow zone in which seismic ways are not recorded
D) The portion of the Earth's surface where water is in a solid form

70. Consider the following statements and select the correct answer using the code given below
1. A sharp release of energy that produce shaking in Earth's crust is known as earthquake
2. Earthquake is a universal phenomenon recorded in all the parts of the world

A) Only 1 is correct B) Only 2 is correct
C) Both 1 and 2 are correct D) Neither 1 nor 2 correct

71. Which one of the following statements is not correct
A) Thunderstorm is the resulting sound from the violent expansion of air close to the lightning
B) Lightning is an integral part of severe Storms and is itself a distinction hazard
C) Most of the fatalities from lightning are in the forenoon
D) Lightning is an electrical charge resulting from separation of positive and negative charges within clouds and the ground

72. Consider the following statements and select the correct answer using the codes given below
1. Hailstones consists of concentric layers of ice
2. Hailstones developed when there is strong updraft of air in cumulus-Nimbus clouds
3. Hailstones occur only in the tropical and temperate latitudes

A) Only 1 and 2 are correct B) Only 2 and 3 are correct
C) Only 1 and 3 are correct D) 1, 2 and 3 are correct

73. Which one of the following statements is not correct
A) The tropical cyclones only develop over large bodies of warm water
B) Tropical cyclones develop when both the air and water temperatures are higher than normal
C) Tropical cyclones only develop in summer in tropical oceans
D) Hurricane are associated with atmospheric fronts

74. The distribution of rainfall in India is not influenced by
A) Himalayan mountains B) Indian Ocean
C) Western Ghats D) Thar desert

75. Out of the following the highest salinity of the oceans is found in the
A) Dead Sea B) Mediterranean sea C) Caribbean Sea D) Black Sea

x-x-x

Master in Geo-informatics

1. Which of the following is most critical reason for increase in global temperatures?
   A) Excessive burning of fossil fuels
   B) Water pollution
   C) Soil degradation and erosion
   D) Degradation of wetland ecosystems

2. The term *'Remote Sensing'* was coined by
   A) Evelyn Salt
   B) Evelyn Pruitt
   C) Henry Ford
   D) George Joseph

3. Biome refers to a group of:
   A) Mammals
   B) Ecosystems
   C) Insects
   D) Reptiles

4. Chipko Movement for the conservation of trees was started by:
   A) Jagat Singh Jungli
   B) Rajendra Singh
   C) Sunderlal Bahuguna
   D) Balbir Singh Seechewal

5. Which of the following area is associated with Asiatic Lion?
   A) Great Himalayan National Park
   B) Sundarbans Delta
   C) Gir Forests
   D) Nilgiri Hills

6. Nitrogen constitute nearly ____per cent of the Earth's atmosphere:
   A) 20
   B) 42
   C) 68
   D) 78

7. The lowest layer of earth's atmosphere is known as:
   A) Magnetosphere
   B) Troposphere
   C) Ionosphere

D) Stratosphere

8. Harike wetland and bird sanctuary in Punjab is facing the problem of weed called:

A) Lantana
B) Ageratum
C) Water hyacinth
D) Parthenium

9. Tobacco contains which of the following:

A) Nicotine
B) Caffeine
C) Alcohol
D) Ethene

10. Which of the following is not an Indian satellite

A) Resourcesat
B) Cartosat
C) Oceansat
D) Radarsat

11. Which of the following is Indian satellite

A) LANDSAT
B) RISAT
C) SPOT
D) IKONOS

12. Which one of the following area in India is a designated biodiversity hotspot?

A) Western Ghats
B) Gulf of Mannar
C) Siwalik Hills
D) Western Rajasthan

13. The infamous Bhopal Gas Tragedy occurred in the year:

A) 2004
B) 1980
C) 1984
D) 1961

14. Mangrove vegetation is found in which of the following regions:

A) Sunderban Deltaic Region
B) Western Ghats
C) Thar Desert
D) Deccan Plateau Region

15. Chlorofluorocarbon (CFC) is mainly generated by:

A) Burning of wood for cooking
B) Refrigeration System
C) Dumping of garbage
D) Burning of waste paper

16. The terms 'Savanna' represents:

A) Tropical Grassland
B) Arctic Desert
C) Boreal Forests
D) Australian Desert

17. Indian Institute of Remote Sensing (IIRS) is situated in which Indian City?

A) Delhi
B) Mumbai
C) Dehradun
D) Nainital

18. Which of the following is the largest desert in the world?

A) Gobi Desert
B) Mojabe Desert
C) Kala Hari Desert
D) Sahara Desert

19. Which of the following is not a *'primary producer'* in an ecosystem?

A) Forest
B) Grassland
C) Fish
D) Phytoplankton

20. A trained and professional map maker is known as:

A) Photographer
B) Cartographer
C) Map Designer

D) Photo Designer

21. June 5 is globally celebrated as:
A) World Environment Day
B) World Health Birthday
C) World Population Day
D) World Peace Day

22. Which gas in the atmosphere screens out the harmful radiation from the sun?
A) Neon
B) Carbon
C) Ozone
D) Helium

23. The First type of technology based remote sensing includes:
A) Aerial photographs
B) Landscape Paintings
C) TV remote control systems
D) Sketches by a German Cartographer

24. 'GAIA' Theory was propounded by which of the following scholar?
A) Hartshorne
B) James Lovelock
C) Humboldt
D) Derek Gregory

25. Remote Sensing Sensors that detect temperature signature are called:
A) Thermal Infrared Sensor
B) Microwave Sensor
C) Radar Sensing
D) Sonar Sensing

26. Energy from the natural heat produced within the earth is known as:
A) Hydropower
B) Geothermal Energy
C) Tidal Energy
D) Solar Energy

27. Select the non-renewable resource amongst the following:
A) Water
B) Timber
C) Coal
D) Oxygen

28. The practice of Organic farming includes cultivation using:

A) Pesticides
B) No chemical fertilizers and pesticides
C) Insecticides
D) Saline water

29. As per the Government of India, the minimum forest cover necessary to maintain ecological balance is:

A) 33% of the total land area
B) 45% of the total land area
C) 50% of the total land area
D) 15% of the total land area

30. Microwave Remote Sensing uses which part of electromagnetic spectrum?

A) Short waves
B) Thermal waves
C) Sound waves
D) Very long waves

31. What type of sensing uses Sound waves?

A) Microwave
B) Sonar
C) Infrared
D) Radar

32. Bermuda Triangle is located in:

A) Arctic Ocean
B) Atlantic Ocean
C) Pacific Ocean
D) Indian Ocean

33. Which of the following is the oldest civilization in the world?

A) Indus Valley
B) Mayan
C) Sumerian
D) Inca

34. Which of the following river is called as the sorrow of China:

A) Hwang Ho
B) Amazon
C) Brahmaputra River

D) Indus River

35. The term GIS refers to?

A) Generic Information System
B) Geographical Information System
C) Generic Intelligent System
D) Geological Intelligent System

36. The famous man-made Palm Islands are located in:

A) Spain
B) Italy
C) Dubai
D) France

37. Cartography is a science and art of:

A) Map Making
B) Computer designing
C) Engine Designing
D) Currency Printing

38. San Andreas fault is located in:

A) Western USA
B) Southern Australia
C) Western Africa
D) Eastern China

39. Which of the following rivers is older than the Himalayan Mountains:

A) River Yamuna
B) River Gandak
C) River Sutlej
D) River Kosi

40. Which one of the following is not an *active remote sensor*

A) RADAR
B) LIDAR
C) THERMAL SCANNER
D) SAR

41. Which one of the following is a *geostationary satellite*

A) INSAT
B) IRS
C) QUICKBIRD
D) SPOT

42. *Visible-reflected IR* region has wavelength range between:

A) 0.4-0.5 μm
B) 3.0-5.0 μm
C) 0.4-3.0 μm
D) 10-14 μm

43. What are the two general data formats used in GIS?

A) Digital and Analogue Map
B) Point and Line
C) Raster and Vector
D) Attribute and Feature

44. GIS deals with which kind of data:

A) Numerical data only
B) Binary data only
C) Attribute data only
D) Spatial and attribute data

45. Metadata is:

A) Data about data
B) Geological data
C) Hydrological data
D) Elevation data

46. Which out of the following mountain ranges is known as the Outer Himalayas?

A) Siwalik Range
B) Pir-Panjal Range
C) Zanskar Range
D) Karakoram Range

47. Which of the following is a data collection technique?

A) Editing
B) Analysis
C) Interview
D) Tabulation

48. The output Device of computer system is:

A) Mouse
B) Printer

C) Scanner
D) Monitor

49. Survey which deals with landed property is called:
A) Topographical Survey
B) Geodetic Survey
C) Ecological Survey
D) Cadastral Survey

50. GPS refers to:
A) Global Positioning System
B) Global Petroleum Survey
C) Global Policy System
D) Global Public System

51. 'Kangra earthquake' of 1905 occurred in which Indian state?
A) Himachal Pradesh
B) Jammu and Kashmir
C) Madhya Pradesh
D) Sikkim

52. 'Spatial database' is also known as:
A) Tabular databases
B) Binary databases
C) Geodatabase
D) None of the above

53. The arrival of Monsoon in North India takes place in:
A) Late December and early January
B) Early to mid-April
C) Late June and early July
D) Late October and early November

54. Summer Capital of 'British ruled India' was:
A) Dehradun
B) Shimla
C) New Delhi
D) Allahabad

55. Which of the following rivers does not flow through Indian Punjab?
A) Beas

B) Satluj
C) Ravi
D) Kosi

56. Which of the following city of India is known as 'the City Beautiful'?
A) Kolkata
B) Chennai
C) Chandigarh
D) Delhi

57. Which of the following is a GIS packages?
A) ILWIS
B) ArcGIS
C) Q-GIS
D) All of the above

58. The 'Disaster Management Cycle' includes:
A) Disaster Mitigation and Preparedness
B) Disaster Response and Monitoring
C) Disaster Rehabilitation and Reconstruction
D) All of the above

59. Which was the first Indian state to enact the Disaster Management Act in 2003?
A) Punjab
B) Gujarat
C) Maharashtra
D) Madhya Pradesh

60. As the magnitude of an earthquake increases, it's potential for damage:
A) Increases
B) Decreases
C) Remains the same
D) None of the above

61. The scientific study of earthquakes is known as:
A) Hydrogeology
B) Seismology
C) Entomology
D) Epistemology

62. Which of the following, which is not a natural hazard?
A) Earthquake
B) Tsunami
C) Tropical Cyclone

D) Nuclear Accident

63. The techniques in cartographic by which points on the sphere of the Earth are transferred to points on the plane surface of a map is known as:

A) Intersection
B) Projection
C) Interpolation
D) Approximation

64. A compass bearing of 155 degrees describes a

A) Northwesterly direction
B) Northeasterly direction
C) Westerly direction
D) Southeasterly direction

65. In which months of a year, northern India receives maximum floods?

A) January-February
B) July-September
C) April-May
D) October-November

66. Lines of latitude are:

A) Diagonal
B) Parallels
C) Meridians
D) None of the above

67. The maximum annual rainfall in India takes place at:

A) Udhampur, Jammu & Kashmir
B) Mawsyngram, Meghalaya
C) Dehradun, Uttarakhand
D) Nagpur, Maharashtra

68. The Radcliffe line is a boundary between

A) India and Nepal
B) India and Bhutan
C) India and Pakistan
D) India and Afghanistan

69. Which Indian state is the only producer of Saffron (Kesar)?

A) Madhya Pradesh
B) West Bengal

C) Bihar
D) Jammu and Kashmir

70. The oldest mountains in India are:
A) Nilgiri Hills
B) Siwalik Hills
C) Aravalli Hills
D) Karakoram

71. Which of the following Indian States has the maximum percentage of mangrove cover?
A) West Bengal
B) Goa
C) Gujarat
D) Jharkhand

72. The 'International day for Biodiversity' is celebrated on:
A) 22 May
B) 15 August
C) 26 January
D) 2 October

73. Greenhouse effect refers to:
A) Ability of atmosphere to retain moisture
B) Ability of atmospheric dust to reflect electromagnetic radiation
C) Ability of atmosphere to form clouds
D) Ability of atmospheric to trap heat and maintain the temperature balance

74. Energy sources that do not increase carbon emissions include:
A) Coal
B) Petroleum
C) Nuclear energy
D) All of the above

75. Which Indian city is the capital of two states?
A) Bhopal
B) Allahabad
C) Ahmedabad
D) Chandigarh

x-x-x

M.Sc.(Industrial Chemistry)

1. V_2O_5 is used as a catalyst in the manufacture of
(A) Ammonia (B) Sulphuric Acid
(C) Polypropylene (D) Nylon-6

2. Which of the following processes is used to manufacture petroleum coke?
(A) Visbreaking (B) Delayed Coking
(C) Hydrocracking (D) Fluid catalytic cracking

3. In petroleum refining, the process used for conversion of hydrocarbons to aromatics is
(A) Catalytic cracking (B) Catalytic reforming
(C) Hydrotreating (D) Alkylation

4. Which of the following is a gas at atmospheric conditions?
(A) Methyl chloride (B) Methylene chloride
(C) Chloroform (D) Carbon tetrachloride

5. Phthalic anhydride is produced by the oxidation of
(A) Naphthalene (B) Benzene (C) Tolune (D) Aniline

6. Vinyl acetate is represented by the formula
(A) CH_2=CHCOOH (B) CH_2=CHOH
(C) CH_2=COOCH=CH_2 (D) CH_3COOCH=CH_2

7. Which of the following is a thermosetting plastic?
(A) Polyethylene (B) Teflon (C) Polypropylene (D) Bakelite

8. Natural rubber is mainly
(A) Polybutadiene (B) Polychloroprene
(C) Polystyrene (D) Polyisoprene

9. High excess air in combustion of fuels results in
(A) Increased fuel combustion (B) Incomplete combustion
(C) Smoky flame (D) Decreased combustion

10. Phosphoric acid is produced in wet process from phosphate rock and
(A) H_2SO_4 (B) NH_3 (C) HNO_3 (D) HCl

11. Liquefied petroleum gas (LPG) is mainly a mixture of
(A) Propane and butane (B) Methane and ethane
(C) High boiling olefins (D) High boiling naphthenes

12. Aniline point is a property of the
(A) Diesel (B) LPG (C) Naphtha (D) Gasoline

13. Chemical formula of BHC, which is an insecticide is

(A) $C_6H_6Cl_6$ (B) C_6Cl_6 (C) C_6H_5Cl (D) $C_6H_4Cl_2$

14. $CaSO_4.\frac{1}{2}.H_2O$ is known as

(A) Blue vitriol (B) Plaster of paris
(C) Gypsum (D) Zeolite

15. Digestion of wood base materials (for manufacture of pulp) is done to

(A) Removes lignin (B) Produce long fibres
(C) Prevent deterioration on storage (D) To reduce yield

16. The inlet pressure in a constant rate filtration

(A) Increases continuously (B) Decreases gradually
(C) Remains constant (D) First increases then decreases

17. What is the unit of kinematic viscosity in SI units?

(A) m^2/s (B) $N/m^2.s$ (C) kg.s/m (D) kg/m.s

18. Which is not a variable head meter?

(A) Venturimeter (B) Pitot tube (C) Rotameter (D) Orificemeter

19. The number of kg vaporized per kg of steam fed to the evaporator is defined as

(A) Capacity (B) Rate of evaporation
(C) Economy (D) Rate of condensation

20. Boiling point elevation of an ideal solution

(A) Increases rapidly with temperature rise
(B) Decreases rapidly with temperature rise
(C) Is independent of pressure
(D) Both (A) and (B)

21. The dipole moment of a hydrogen halide H-Xis 1.8Dand the bond length is 1.5 Å. The percentage ionic character of H-X will be

(A) 25 % (B) 50 % (C) 75 % (D) 80 %

22. Which of the following diatomic molecules would be stabilized by the removal of an electron?

(A) C_2 (B) CN (C) N_2 (D) O_2

23. Which of the following represents a set of hard acid and soft base respectively?

(A) Mg^+, O_2^{2-} (B) Mg^{2+}, SR^- (C) BF_3, F^- (D) BF_3, H_2O

24. Which of the following belongs to the C_{3v} point group?

(A) SO_3 (B) BBr_3 (C) NH_3 (D) $AlCl_3$

25. Carbon atom in $C_2(CN)_4$ are

(A) sp hybridized (B) sp^2 hybridised
(C) sp and sp^2 hybridised (D) sp, sp^2 and sp^3 hybridised

26. If you heat a 5 L balloon from a temperature of 25^0C to 50^0C, its new volume will be:
(A) 10 L (B) 2.5L (C) 5.42L (D) 4.61L

27. For the reaction 2HI (g) $\rightarrow H_2(g) + I_2(g)$, K_p= 0.0198 at 721 K. In a particular experiment, the partial pressures of $[H_2]$ and $[I_2]$ at equilibrium are 0.710 and 0.888 atm, respectively. The partial pressure of HI is
(A) 7.87 atm (B) 1.98 atm (C) 5.64 atm (D) 0.125 atm

28. 50 ml of 0.2 M KOH is added to 40 ml of 0.5 M HCOOH. The pH of the resulting solution is: (Ka = 1.8 x 10^{-4} and log 18 = 1.26)
(A) 3.74 (B) 5.64 (C) 7.57 (D) 3.42

29. Consider the following redox equation:

$12H^+_{(aq)} + 2IO_3^-{}_{(aq)} + 10Fe^{2+}_{(aq)} \rightarrow 10Fe^{3+}_{(aq)} + I_{2(s)} + 6H_2O_{(l)}$

The reducing agent is

(A) I_2 (B) H^+ (C) Fe^{2+} (D) IO_3^-

30. Carbenol is the trivial name for :
(A) $(CH_3)_3COH$ (B) C_2H_5OH (C) CH_3OH (D) $CH_3CH_2CHOHCH_3$

31. In a certain reaction ΔH = -136 kJ and Ea reverse = 236 kJ. Which of the following is true of its forward reaction?
(A) The reaction is exothermic and Ea = -100 kJ
(B) The reaction is exothermic and Ea = 100 kJ
(C) The reaction is endothermic and Ea = 372 kJ
(D) The reaction is endothermic and Ea = 232 kJ

32. A compound formed by elements A and B crystallizes in cubic structure, in which atoms of A are at the corners while that of B are at the face centre. The formula of the compound is –
(A) AB_3 (B) AB (C) A_3B (D) A_3B_2

33. The correct arrangement of NH_3, N_2H_4, NH_2OH and CH_3NH_2 in the order of increasing base strength is
(A) $NH_3 < N_2H_4 < NH_2OH < CH_3NH_2$ (B) $NH_2OH < N_2H_4 < NH_3 < CH_3NH_2$
(C) $CH_3NH_2 < NH_3 < N_2H_4 < NH_2OH$ (D) $N_2H_4 < NH_2OH < CH_3NH_2 < NH_3$

34. The calculated ground state magnetic moment of Sm^{3+} at room temperature is
(A) 0.84 BM (B) 5.97 BM (C) 3.25 BM (D) 7.9 BM

35. Which is thermodynamically unstable and also kinetically labile?
(A) $[Co(H_2O)_6]^{3+}$ (B) $[Co(H_2O)_6]^{2+}$ (C) $[Co(NH_3)_6]^{3+}$ (D) $[Co(NH_3)_6]^{2+}$

36. Which of the following conditions is necessary for a reaction to be spontaneous?

(A) $\Delta S_{sur} > 0$ (B) $\Delta S_{sys} > 0$ (C) $\Delta S_{sur} + \Delta S_{sys} > 0$ (D) $\Delta S_{sur} + \Delta S_{sys} < 0$

37. Calculate the equilibrium constant at 25°C for the reaction

$2\ NO(g) + O_2(g) \rightleftharpoons 2\ NO_2(g)$ given that $\Delta_r G° = -69.8\ kJ\ mol^{-1}$.

(A) 1.7×10^{12} (B) 28.2 (C) 1.03 (D) 5.91×10^{-13}

38. A typical compound undergoes Cannizaro's reaction and aldol condensation it is:

(A) $(CH_3)_2CHCHO$ (B) HCHO

(C) C_6H_5CHO (D) CH_3CHO

39. Which of the following will be strongly acidic ?

(A) When pOH = 4.5 (B) When pH = 14

(C) When pOH = 7 (D) When pH = 0

40. Correct relation between K_p, K_c, and K_x when number of moles of product is equal to number of moles of reactant :

(A) $K_p > K_c = K_x$ (B) $K_p = K_c = K_x$

(C) $K_p < K_c = K_x$ (D) $K_p = K_c \neq K_x$

41. Which of the following Maxwell's equations remain unchanged under all circumstances?

(A) $\vec{\nabla} \times \vec{E} = -\frac{\partial \vec{B}}{\partial t}$ (B) $\vec{\nabla} \times \vec{H} = \vec{J} + \frac{\partial \vec{D}}{\partial t}$ (C) $\vec{\nabla} . \vec{D} = 0$ (D) $\vec{\nabla} . \vec{B} = 0$

42. In an ac circuit,

(A) The current always leads the voltage

(B) The current always lags behind the voltage

(C) The current and voltage are always in phase

(D) The phase relationship between current and voltage varies, depending on the circuit.

43. A metal bar radiates energy at 50 W at 200°C. The same bar at 250°C will radiate energy at

(A) 40 W (B) 75 W (C) 55 W (D) 1000 W

44. The electron's mass will be double of its rest mass at a speed of

(A) 0.75 c (B) 0.43 c (C) 0.5 c (D) 0.87 c

45. The Miller indices of a plane parallel to x and z axes are

(A) (1 1 0) (B) (1 0 1) (C) (0 1 0) (D) (1 1 1)

46. In a X-ray tube, the increase in the applied potential difference results in the

(A) Increase in the frequency of emitted X-rays

(B) Increase in the wavelength of emitted X-rays.

(C) Increase in the intensity of the emitted X-rays

(D) Increase in the speed of emitted X-rays

47. In case of a magnetic material, the neighboring dipoles will have negligible interaction if the material is

(A) Diamagnetic (B) Paramagnetic (C) Ferromagneic (D) Ferrimagnetic

48. According to Maxwell's law of distribution of molecules, the root mean square velocity of gas molecules is

(A) Greater than the mean velocity
(B) Greater than the most probable velocity
(C) Equal to the mean velocity
(D) Equal to the most probable velocity

49. According to Debye's theory of specific heat of soilds, the specific heat at high temperatures (T) is proportional to

(A) T (B) T^0 (independent of temperature)
(C) T^2 (D) T^3

50. An electron is confined to move in an infinite potential well that is 10 nm wide. The ground state energy of such an electron is given by

(A) 377 MeV (B) 1508 MeV (C) 3.77 MeV (D) 15 MeV

51. The direction of Hall voltage is

(A) Perpendicular to the applied electric field
(B) Perpendicular to the applied magnetic field
(C) Perpendicular to both the applied electric and magnetic field
(D) Is independent of the directions of the applied fields.

52. When a light wave is reflected at the surface of an optically denser medium, it suffers a phase change of

(A) π (B) $\pi/2$ (C) $\pi/4$ (D) 2π

53. If the number of lines on a diffraction grating is increased then

(A) The principal and secondary maxima will become sharp and intense.
(B) The principal and secondary maxima will become less sharp and less intense.
(C) The principal maxima will become intense and sharp while secondary maxima will become weaker.
(D) The principal maxima will become weaker while secondary maxima will become intense and sharp.

54. The wavelength of radiation given out by a laser with energy of 3 eV is

(A) 414 nm (B) 41.4 nm (C) 6.63×10^{-26} m (D) 663 nm

55. A spring having spring constant ''k'', mass ''m'' and frequency of oscillation ''ω'' is cut in half and the same mass is suspended from one of its halves. The frequency of oscillation becomes

(A) ω (B) 2ω (C) $\omega/2$ (D) $\omega/\sqrt{2}$

56. Electromagnetic waves are produced by

(A) An accelerated charge
(B) A moving but unaccelerated charge
(C) A static charge
(D) A chargeless particle

57. The de-broglie wavelength of wave associated with an electron accelerated through 150 volts is
(A) 0.1 nm (B) 1 nm (C) 2.02 nm (D) 0.22 nm

58. If the Fermi energy of a metal is 1.4 eV, the Fermi temperature of the metal is approximately
(A) 1.6 x 10^3 K (B) 1.6 x 10^4 K (C) 1.6 x 10^5 K (D) 1.6 x 10^6 K

59. The number of independent variables for a free particle in a 3-D space is
(A) N (B) 2N (C) 3N (D) Zero

60. The characteristic impedance of a perfect conductor to the electromagnetic wave is:
(A) Zero (B) One (C) Infinity (D) Negative

61. The general solution of the ordinary differential equation $2\frac{d^2y}{dx^2} - 2\frac{dy}{dx} + y = 0$ is
(A) $y = [C_1 \cos\left(\frac{x}{2}\right) + C_2 \sin(\frac{x}{2})]$
(B) $y = e^{\frac{x}{2}}[C_1 \cos\left(\frac{x}{2}\right) + C_2 \sin(\frac{x}{2})]$
(C) $y = [C_1 \cos(x) + C_2 \sin(x)]$
(D) $y = e^{\frac{-x}{2}}[C_1 \cos\left(\frac{x}{2}\right) + C_2 \sin(\frac{x}{2})]$

62. The general solution of the differential equation $(D^3 + 4D)y = \sin(2x)$ where $D = \frac{d}{dx}$, is given by
(A) $y = c_1 + C_2 \cos(2x) + c_3 \sin(2x) - \frac{x}{8} \sin(2x)$
(B) $y = C_2 \cos(2x) + c_3 \sin(2x) + \frac{x}{8} \sin(2x)$
(C) $y = \cos(2x) + \sin(2x)$
(D) $y = c_1 e^x + c_2\, e^{2x} + \cos(2x)$

63. Find the Laplace transform of $(t) = e^t \cos(t)$.
(A) $\frac{s}{s^2+1}$ (B) $\frac{s-1}{(s-1)^2-4}$ (C) $\frac{s+1}{(s+1)^2+1}$ (D) $\frac{s-1}{(s-1)^2+1}$

64. Let $z = y\, f(\frac{y}{x})$, then the partial differential equation representing this surface is given by
(A) $z = p\, x + qy$ (B) $z = p\, x - qy$ (C) $z = p\, x^2 + qy^2$ (D) $z = p^2\, x + q^2 y$

65. Find the value of $\lim_{x\to\infty} \frac{2\, x^{5/3} - x^{1/3} + 7}{x^{8/5} + 3x + \sqrt{x}}$
(A) 2 (B)1 (C) ∞ (D) 0

66. Find the area of the region between the x-axis and the graph of the $f(x) = x^3 - x^2 - 2x$, $-1 \leq x \leq 2$.

(A) 12 (B) 37/12 (C) 10 (D) 43/12

67. The region between the curves $x = \frac{2}{y}$, $1 \leq y \leq 4$, and the y-axis is revolved about the y-axis to generate a solid. Find its volume.

(A) 20 (B) 2π (C) π (D) 3π

68. Find all real values of x for which the given series is convergent:

$$1 + x + x^2 + x^3 + x^4 + \cdots \ldots \ldots \ldots$$

(A) All real values of x (B) $|x| < 1$

(C) $|x| \leq 1$ (D) $|x| > 1$

69. The value of $\lim_{n\to\infty} \frac{\ln n}{n^{1/n}}$ is

(A) Divergent (B) 1 (C) 0 (D) -1

70. Find the angle between $\vec{A} = 3\hat{\imath} - 2\,\hat{\jmath} + \hat{k}$ and $\vec{B} = 2\,\hat{\jmath} + 4\,\hat{k}$.

(A) 30^o (B) 90^o (C) $\pi/4$ (D) 20^o

71. Find the value of $\int_0^2 \int_0^{\sqrt{4-y^2}} (x^2 + y^2) dx\, dy$

(A) π (B) 3π (C) 2π (D) $-\pi$

72. Find the rank of the matrix $A = \begin{bmatrix} 3 & 2 & -1 \\ 4 & 2 & 6 \\ 7 & 4 & 5 \end{bmatrix}$

(A) 1 (B) 3 (C) 0 (D) 2

73. Find the values of λ and μ for which the system of equations has a unique solution

$$3x + 2y + z = 6, \quad 3x + 4y + 3z = \mu, \quad 6x + 10\,y + \lambda\, z = \mu$$

(A) $\lambda = 8, \mu = 9$

(B) $\lambda \neq 8$, μ is any real number

(C) $\mu \neq 36$, λ is any real number

(D) $\lambda = 8$, $\mu = 4$

74. Find the eigen values of the matrix $B = \begin{bmatrix} 1 & 2 & -2 \\ 1 & 2 & 1 \\ -1 & -1 & 0 \end{bmatrix}$

(A) 1, -1,3 (B) 1,1,4 (C) 2,3,4 (D) 1,5,7

75. Compute A^{-2} given that $A = \begin{bmatrix} 1 & 1 \\ 2 & 4 \end{bmatrix}$.

(A) $\begin{bmatrix} 9/4 & 5/4 \\ 3/4 & 2/3 \end{bmatrix}$ (B) $\begin{bmatrix} 9 & 4 \\ 3 & 2 \end{bmatrix}$ (C) $\begin{bmatrix} 9/2 & -5/4 \\ -5/2 & 3/4 \end{bmatrix}$ (D) $\begin{bmatrix} -1 & -1 \\ 2 & -4 \end{bmatrix}$

x-x-x

M.Com.(Business Innovation)

1. The Highest Mountain peak within the territory of India is:-
A) Kanchanjunga with a height of 8590 metres above Sea Level
B) K2(Gidwin Austen) with height of 8610 metres above sea level
C) Nanda Devi with height of 7820 metres above sea level
D) Nanga Parbat with a height of 8130 metres above sea level

2. The following Sea has the maximum area among all the seas of the world:-
A) Arabian Sea B) Mediterrian Sea C) South China Sea D) Black Sea

3. The Reserve Bank of India was established in the year
A) 1947 B) 1935 C) 1950 D) 1858

4. The national income estimates of India are prepared by
A) Ministry of Finance B) National Sample Survey
C) Indian Statistical Institute D) Central Statistical Organisation

5. Which of the following lies above hydrogen but below Iron in the activity series of metals:-
A) Lead B) Zinc C) Copper D) Silver

6. In the spectrum of white light, the band between the blue band and the yellow band is
A) Red B) Orange C) Brown D) Green

7. Which of the following organisms causes kalaazar:-
A) Staphylococci B) Trypanosoma C) Leishmania D) Glardia intestinalis

8. Olfactory receptors are located in our:-
A) Ears B) Nose C) Tongue D) Eyes

9. The sky appears blue due to the:-
A) Scattering of light B) Reflection of light
C) Refraction of light D) Dispersion of light

10. Ethanol when treated with hot concentrated sulphuric acid gives:-
A) Ethane B) Ethene C) Ethye D) Ethanoic acid

11. Who discovered the electrolysis of water:-
A) William Nicholson B) Michael Faraday
C) Jan Rudolf Deiman D) Alessandro Volta

12. Which of the following elements has the lowest melting point?
A) Gallium B) Sulphur C) Silicon D) Aluminium

13. Prophet Mohammad was born in

A) 571 AD B) 720 AD C) 620 AD D) 510 AD

14. During the time of which Mughal Emperor did the East India Company establish its first factory in India?
A) Akbar B) Jahangir C) Shahjahan D) Aurangzeb

15. Capital of India was transferred from Calcutta to Delhi in the year
A) 1901 B) 1911 C) 1921 D) 1922

16. Two natural numbers whose sum is 96 cannot be in the ratio of:
A) 7:5 B) 5:3 C) 9:7 D) 5:9

17. A company decided to reduce the price of its product by 15% so that the sales volume of the company increased. If the revenue of the company remained the same, find the percentage change in their sales volume.
A) 15% B) 17.65% C) 19.4% D) 20%

18. A milkman mixes 40% of water by volume and sells the whole mixture at the cost price of milk. If the cost of water is 20% of the price of milk, then what is the net profit percentage of the milkman?
A) 47% B) 32% C) 40% D) 21%

19. By selling 45 m of cloth a merchant gains the cost price of 15 m. Find the gain %.
A) 200/3% B) 50/3% C) 100/3% D) 79/3%

20. By selling the oranges at a rate of 14 for a rupee, a fruit seller loses 4%. How many oranges must he sell for a rupee to gain 12%.
A) 11 B) 12 C) 13 D) 14

21. A and B can do a piece of work in 10 days, B and C in 12 days, and C and A in 15 days. If B alone works for 15 days and then joined by A and C, in how many days will the work be finished.
A) 16 days B) 15 days C) 14 days D) 13 days

22. A can do as much of work in 2 days as B in 3 days and B as much in 4 days as C in 5 days. In what time A, B, and C together do the work if A can do it in 22 days?
A) 11 days B) 12 days C) 10 days D) 9 days

23. A milkman buys milk at Rs 15 per litre. He mixed the water with it and sell the mixture at cost price. In what proportion is water mixed with milk if his profits were 6 - 1/4%.
A) 1: 17 B) 1: 8 C) 1: 12 D) 1: 16

24. The average age of the 5 children is 8 years. If age of the father be included the average age is increased by 7 years. Find the age of father.

A) 55 years B) 50 years C) 45 years D) 40 years

25. A company produces on an average 4000 items per month for its first three months. How many items it must produce over next 9 months to average 4375 item per month over the whole year?
A) 4100 B) 4200 C) 4500 D) 4800

26. A man buys a land and gives for it 10 times the annual rent. Find the rate of interest he gets for his money.
A) 11% B) 10% C) 9% D) 12%

27. Rs 1500 be placed at interest at a rate of 10% and interest be added to the principal after every 5 years. In how many years will it amount to Rs 2500.
A) 9-1/6 years B) 6-1/9 years C) 7-1/9 years D) 5-1/9 years

28. By walking ¾ of his usual speed, a man reaches office 15 minutes late. Find his usual time.
A) 20 minutes B) 25 minutes C) 30 minutes D) 35 minutes

29. The breadth of a room is twice its height and half its length and volume of the room is 729 cubic metre. How high is the roof of the room?
A) 9 metre B) 10 metre C) 11 metre D) 12 metre

30. I bought two horses for Rs 1350. I sold one of them at a loss of 6% and another at a gain of 7-1/2%. On the whole I neither gained nor lost. What did each horse cost?
A) Rs 750, Rs 600 B) Rs 800, Rs 550 C) Rs 700, Rs 650 D) Rs 675, Rs 675

31. A can do a piece of work in 20 days. He worked for 5 days. After this B did the remaining work in 3 days. How many days A and B together take to finish the whole work.
A) 3 days B) 10/3 days C) 11/3 days D) 13/3 days

32. By selling 33 m of cloth a merchant gains the selling price of 11 m. Find the gains or loss %.
A) 40% B) 45% C) 50% D) 55%

33. A student had to secure 40% marks to pass. He got 440 marks and failed by 40 marks. Find the maximum marks.
A) 1000 B) 1100 C) 1200 D) 1300

34. Divide Rs53 among A, B and C such that A gets Rs 7 more than B and B Rs 8 more than C.
A) 10, 18, 25 B) 25, 18, 10 C) 26, 19, 10 D) 24, 17, 9

35. Find the least number which when divided by 12 and 16 leaves 3 as remainder
A) 52 B) 53 C) 51 D) 54

36. Find the odd man out :

R13: 78X::Y19: ?

A) D104 B) E144 C) 94F D) 114E

37. Find the odd man out

KO:VD::RN:?

A) AJ B) JB C) JC D) KD

38. A clock is started at noon. By 10 minutes past 5, the angle that the hour – hand has turned through is:

A) 145 degree B) 150 degree C) 155 degree D) 160 degree

39. The first Republic Day of India was celebrated on 26TH January, 1950. What was the day of the week on that date?

A) Wednesday B) Thursday C) Friday D) Saturday

40. A clock gains 10 minutes in every 24 hours. It is set right on Monday at 8 a.m. What will be the correct time on the following Wednesday, when the watch indicates 6 p.m.?

A) 5:30 p.m. B) 5: 24 p.m. C) 5: 36 p.m. D) 5: 20 p.m.

41. Deshmukh walks towards West then towards South and turning 45 degree right, walks for a while and lastly turns left. In which direction is he walking now?

A) South B) East C) South-East D) North-East

42. In a certain code language, CYBERSHOT is coded as XWEVPVSMV. What will be the code for CONDITION in the same code language?

A) XMQWKWRMQ B) XMQXGWRMQ

C) XMQWGWRMQ D) None of the above

43. If cow is coded 31523, then the code for HORSE is

A) 81815195 B) 81518195 C) 81517195 D) 81516195

44. In a certain code language, 'wind' is called 'blue', 'blue' is called 'pilot', 'pilot' is called 'road', 'road' is called 'sea', and 'sea' is called 'bull'. Who flies an aircraft?

A) Sea B) Road C) Blue D) Wind

45. A man after finishing his office in the evening walks in the direction facing the sun. Then he turns to his right, then he turns to his left, and then turns to his left and then to his right. In which direction is he moving?

A) South B) North C) East D) West

46. Complete the given series:

6, 21, 66, 201, ?

A) 603 B) 267 C) 606 D) 506

47. Complete the given series

20, 32, ?, 70, 100, 140

A) 42 B) 44 C) 48 D) 46

48. Ten points are marked on a straight line and 11 points are marked on another straight line. How many triangles can be constructed with vertices from among the above points?
A) 495 B) 550 C) 1045 D) 2475

49. A die is rolled twice. What is the probability that sum of numbers on the two faces is 5?
A) 5/12 B) 1/9 C) 1/6 D) 5/36

50. In an arithmetic progression, the fourth term and the eighth term are in the ratio 2: 3. Find the value of T3/T10 (Third Term/Tenth Term).
A) 3/7 B) 1/2 C) 3/2 D) 5/7

Directions for question 51 to 54: Answer the following questions based on the given information.
Ten people- D, A, N, G, E, R, O, U, S and L are sitting around a circular table according to the following conditions.
*People whose initials are adjacent in alphabetical order sit opposite to each other
*N sits two positions to the right of D
*R cannot sit beside N,D, and O.
*There is only one person sitting between A and G.

51. Who is sitting to the immediate right of R?
A) A B) G C) E D) L

52. Who is sitting opposite to L?
A) A or G B) G or U C) U or A D) A

53. If L is sitting beside R, then who are the neighbours of A?
A) E and O B) R and N C) S and O D) Cannot be determined

54. Using the data given in the above question and the condition that if A is opposite to U, find the neighbours of G?
A) E and O B) R and N C) S and O D) D and N

55. In a certain code language, SERIES is coded as 5625 and PIPE is coded as 2116. How will WAP be coded in the same code language?
A) 1331 B) 1600 C) 1726 D) 4096

56. A market economy is one in which
A) Products are sold B) Products and factors are bought
C) Products and factors are bought and sold D) All the above

57. The main objective of the Minimum Support Price (MSP) is/are:
1. Check fall in price beyond a limit
2. Protect interest of the consumers
3. Make procurement from the wholesalers easy
A) 1 only B) 1 and 2 only C) 2 and 3 only D) 1, 2 and 3

58. Imports into a country generate income for
A) Foreign producers B) Domestic manufacturing
C) Traders D) The government

59. Indian financial system has provided for the transfer of resources from the centre to the states, the important means of resource transfer is/are:-
A) Tax sharing B) Grant-in-aid C) Loans D) All the above

60. Which among the following can be used to check Inflation temporarily?
A) Decrease in money supply B) Increase in wages
C) Decrease in taxes D) None of these

61. On which of the following factors 'marginal cost' depends?
A) Only Fixed Cost B) Only Variable Cost
C) Both Fixed and Variable Cost D) Neither Fixed Cost nor Variable Cost

62. Devaluation of currency leads to:
A) Fall in domestic prices B) Increase in domestic prices
C) No impact on domestic prices D) Erratic fluctuations in domestic prices

63. Which among the following was the most important characteristic of India's foreign trade throughout the colonial period:-
A) Import Surplus B) Import Substitution
C) Export Surplus D) Export deficiency

64. Which of the following panel was set up by the government of India suggested total decontrol of sugar industry?
A) Deepak Parekh Panel B) Rangarajan Panel
C) Srikrishna Panel D) Radheshyam Panel

65. According to Marx Economic Inequality leads to:
A) Class Conflicts B) Exploitation
C) Moral degradation D) Slow capital accumulation

66. The Tata Iron and Steel Company (TISCO) was incorporated in:-
A) 1907 B) 1911 C) 1913 D) 1919

67. Which of the following ports is the first port in India to be a public company?
A) Kandla B) Mangalore C) Ennore D) Mormugao

68. Which of the following events intensified British control over India's foreign trade?
A) Victory of the British in Battle of Plassey
B) Opening of the Suez Canal
C) Transfer of Bombay from the Portuguese to the British
D) Opening up of the Panama Canal

69. Lorenz Curve indicates:

A) Income distribution
B) Taxable Income Elasticity
C) Relationship between the price of a certain commodity and its demand
D) Rate of employment

70. Which among the following is not one of the goals of the five-year plans in India?
A) Growth B) Modernisation C) Self-reliance D) Liberty

71. A sustained rise in the general price level is called:-
A) Stagflation B) Deflation C) Disinflation D) Inflation

72. Which of the following financial institutions were set up to provide credit facilities to industries?
1. IFCI 2. ICICI 3. IDBI 4. NABARD

Choose the correct answer from the code given below:-
A) 2 and 3 only B) 3 and 4 only C) 1, 2 and 3 only D) 1, 2, 3 and 4

73. Which among the following ports in India is also known as the 'child of partition'?
A) Paradip B) Kolkata C) Kandla D) Haldia

74. Which among the following sector employs the maximum people in India?
A) Manufacturing Sector B) Agriculture Sector
C) Service Sector D) Tourism sector

75. Which among the following is the oldest Public Sector Bank in India?
A) Punjab National Bank B) Imperial Bank of India
C) Allahabad Bank D) Central Bank of India

x-x-x

MBA for Executives (MBAfEX)

1. **At which of the following places the Sanskriti Khumb began on January 10, 2019?**
   A) Haridwar B) Prayagraj C) Ujjain D) Nashik

2. **Union leaders at different levels & at federations are elected on _____**
   A) Democratic Principle B) Political Considerations
   C) Employer's Recommendation D) Seniority Basis

3. **Maharashtra's UNICEF joined hands with this organisation for addressing issues in child protection.**
   A) Directorate of Technical Education
   B) Education Department, Goa
   C) Directorate of Women and Child Development
   D) Women and Child Development, Goa

4. **How many MOU's signed between India and Saudi Arabia on establishing a mechanism for Investment Infrastructure in India?**
   A) 4 B) 3 C) 9 D) 6

5. **Swimming price for a new product is:**
   A) Low Initial Price B) Average Price C) High Initial Price D) Moderate Price

6. **Which organisation released World Employment and Social Outlook Trends 2019 report?**
   A) International Labour Organization B) United Nations
   C) OCED D) UNESCO

7. **The best indicator of economic development of any country is?**
   A) Its Agriculture B) Its Transport
   C) Its Gross Production D) Its Per Capita Income

8. **Mutually exclusive investment proposals are these:**
   A) Wherein the acceptance of one proposal leads to rejection of all other proposals
   B) That requires special sources of financing
   C) That has unique features
   D) The reduce the total risk complexion of the firm

9. **Capital budgeting decisions are generally:**
   A) Irreversible B) Irrevocable C) Reversible D) Revocable

10. **The assumptions about future derived from forecasting and used in planning are known as _____.**
    A) Planning Premises. B) Freehold Premises.
    C) Business Premises. D) Corporate Premises.

11. On which topic was the Raisina Dialogue organised in New Delhi on Jan. 09, 2019?

A) Public Health B) Artificial Intelligence
C) Agriculture and GM Crops D) Foreign Policy Challenges

12. When price of a substitute of commodity 'X' falls, the demand for 'X':

A) Falls B) Remain Unchanged
C) Increase at Increasing Rate D) Rises

13. Under point method, factor(s) generally considered are

A) Skill, Effort, Accountability
B) Skill, Job Enrichment, Accountability
C) Wage, Job Enrichment, Accountability
D) Wage Effort, Accountability

14. How many workers have been selected for PM Shram Awards 2017?

A) 50 B) 40 C) 30 D) 20

15. Who will launch SPHEREx Mission to investigate Universe?

A) NASA B) ISRO C) SpaceX D) JAXA

16. The process whereby a manager shares his work and authority with his subordinates is_____.

A) Decentralisation B) Responsibility C) Delegation D) Decision Making

17. Which ministry developed an Integrated Government Online Training Programme along with the Department of Personnel and Training?

A) Ministry of Labour and Employment
B) Ministry of Housing and Urban Affairs
C) Ministry of Home Affairs
D) Ministry of Personnel, Public Grievances and Pensions

18. Trade credit is a:

A) Negotiated source of finance
B) Hybrid source of finance
C) Spontaneous source of finance
D) Source of credit from the owners of the business

19. Who is planning to send a probe to study the sun early next year?

A) JAXA B) NASA C) ISRO D) BARC

20. Name the cyclone that has hit the Indian States of Odisha and West Bengal recently.

A) Cyclone Hudhud B) Cyclone Gaja C) Cyclone Phailin D) Cyclone Fani

21. When did National Space Day 2019 observed?

A) May 2 B) May 3 C) May 4 D) May 5

22. Who is the author of the non-fiction book titled India Positive?

A) Vikram Seth B) Kiran Desai C) Salman Rushdie D) Chetan Bhagat

23. Name the Bank which became the second largest public sector undertaking (PSU) bank.

A) Axis Bank B) Bank of Baroda
C) Union Bank of India D) Dena Bank

24. The theme for World Consumers Day 2019 is;

A) Building a Digital World Consumers Trust
B) Trusted Smart Products
C) Making Digital Marketplaces Fairer
D) Consumer Justice Now!

25. Name the social entrepreneur who won a Commonwealth Youth Award for the Asian Region at London.

A) Padmanaban Gopalan B) Akansha Hazari
C) Ashoka D) Harish Hande

26. Who was named as the Brand Ambassador of SBI's YONO?

A) Saurabh Chaudhary B) Neeraj Chopra
C) Swapna Barman D) Vinesh Phogat

27. The Indian Olympic Association (IOA) has submitted a formal expression of interest to host _____ Olympics.

A) 2028 B) 2026 C) 2024 D) 2032

28. Who flagged off the first Indigo Airlines flight to Singapore from the Vijayawada?

A) Narendra Modi B) Venkaiah Naidu
C) Ram Nath Kovind D) Nirmala Sitharaman

29. Which of the following does not fall within the jurisdiction of MRTP commission?

A) Prevention of Monopolistic Trade practices
B) Prevention of Restrictive Trade Practices
C) Prohibition of Unfair Trade Practices
D) Regulation of Combinations

30. The abbreviation 'CD' stands for-

A) Commercial Demand B) Certificate of Deposit
C) Cash Deposit D) Commercial Documentation

31. Which of the following is not included under non-tax revenue receipts for the Budget?

A) Interest Receipts B) Stamp and Registration Fee
C) Grants-In-Aid D) Receipts From Social Services

32. Number of micro, small and medium enterprises (MSME) in 2016-17 was –

A) 5.53 crore B) 2.53 lakh C) 5.53 thousand D) 5.53 Lakh

33. Which one of the following multipurpose project is the largest project in the State?

A) Beas Project B) Indira Gandhi Canal Project

C) Bhakra Nangal Project D) Mahi Bajaj Sagar Project

34. The ratio between the speeds of two trains is 7: 8. If the second train runs 440 kms in 4 hours, then the speed of the first train is:

A) 47.4 km/hr B) 57.19 km/hr C) 68.13 km/hr D) 96.25 km/hr

35. T, R, P, N, L , ? ,?

A) J, G B) J, H C) K, H D) K, I

36. Peace: Chaos :: Creation : ?

A) Manufacture B) Destruction C) Build D) Construction

37. Oceans : Deserts : : Waves : ?

A) Dust B) Sand Dunes C) Ripples D) Sea

38. Find the odd one out

A) King B) Queen C) Knight D) Minister

39. If 'eraser' is called 'box', 'box' is called 'pencil', 'pencil' is called 'sharpener', and 'sharpener' is called 'bag', what will a child write with?

A) Eraser B) Bag C) Pencil D) Sharpener

40. Pointing to a man in a photograph, a woman said, "His brother's father is the only son of my grandfather." How is the woman related to the man in the photograph?

A) Sister B) Aunt C) Grandmother D) Daughter

Directions (41-44): In the following questions, four alternatives are given, select the one which is different from the other three responses.

41. A) Ladder B) Stairecase C) Bridge D) Escalator

42. A) Wheat B) Train C) Proud D) Drive

43. A) Ample B) Copius C) Plentiful D) Abundance

44. A) Flute B) Violine C) Guitar D) Sitar

45. Amnesia : Memory : : Paralysis : ?

A) Movement B) Limbs C) Handicapped D) Legs

46. Two persons starting from the same place walk at a rate of 5kmph and 5.5kmph respectively. What time will they take to be 8.5km apart, if they walk in the same direction?

A) 17 hrs B) 22 hrs C) 25 hrs D) 12 hrs

47. A vessel is filled with liquid, 3 parts of which are water and 5 parts of syrup. How much of the mixture must be drawn off and replaced with water so that the mixture may be half water and half syrup?

A) 1/3 B) 1/4 C) 1/5 D) 1/7

48. If each side of a square is increased by 25%, find the percentage change in its area?

A) 65.25 B) 56.25 C) 65 D) 56

49. A tea expert claims that he can easily find out whether milk or tea leaves were added first to water just by tasting the cup of tea. In order to check this claims 10 cups of tea are prepared, 5 in one way and 5 in other. Find the different possible ways of presenting these 10 cups to the expert.

A) 340 B) 210 C) 290 D) 252

50. AZ, BY, CX, ?

A) EF B) GH C) IJ D) DW

51. ?, SIY, OEU, KAQ, GWM, CSI

A) WNE B) WNB C) WNE D) WMC

52. Peace: Chaos:: Creation : ?

A) Manufacture B) Destruction C) Build D) Construction

53. Mind : Body ::

A) Water : Air B) CPU : Hard Disk C) Ship : Oil D) Software : Computer

54. I). A, B, C, D, E and F are six members of a family.
II). One couple has parents and their children in the family.
III). A is the son of C and E is the daughter of A.
IV). D is the daughter of F who is the mother of E.
Which of the following pairs is the parent of the couple?

A) CF B) AB C) AF D) BC

55. There are six persons A, B, C, D , E and F. C is the sister of F. B is the brother of E's husband. D is the father of A and grandfather of F. There are two fathers, three brothers and a mother in the group. Which of the following is a group of brothers?

A) ABD B) ABF C) BFC D) BDF

Antonym questions: (56-58): In the following question choose the word which is the exact OPPOSITE of the given words.

56. Culpable

A) Irresponsible B) Careless C) Defendable D) Blameless

57. Perfidious

A) Treacherous B) Loyal C) Humane D) Religious

58. Profane

A) Wild B) Energy C) Kitten D) Pious

Synonym questions (59-61): In the following the questions choose the word which best expresses the meaning of the given word.

59. Tenacity

A) Ingratitude B) Tendency C) Perseverance D) Splendour

60. Lament

A) Console B) Condone C) Comment D) Complaint

61. Ludicrous

A) Dismal B) Simple C) Clear D) Absurd

62. 2Z5, 7Y7, 14X9, 23W11, 34V13, ?

A) 27U24 B) 47U15 C) 45U15 D) 47V14

63. The fourth Buddhist Council took place during the reign of:

A) Kanishka B) Ashoka C) Bimbisara D) Samudragupta

64. The most important god in the Rigvedic period was:

A) Agni B) Rudra C) Varuna D) Indra

65. Which symbol shows renunciation?

A) Lotus B) Bull C) Elephant D) Horse

66. Kathakali is a dance prevalent in which state?

A) Kerala B) Andhra Pradesh C) Orissa D) Tamil Nadu

67. The story of 'My Experiments of Truth' is the autobiography of:

A) Bal Gangadhar Tilak B) Mahatma Gandhi

C) Lala Lajpat Rai D) Gopal Krishan Ghokle

68. The first battle of Panipat took place in the year:

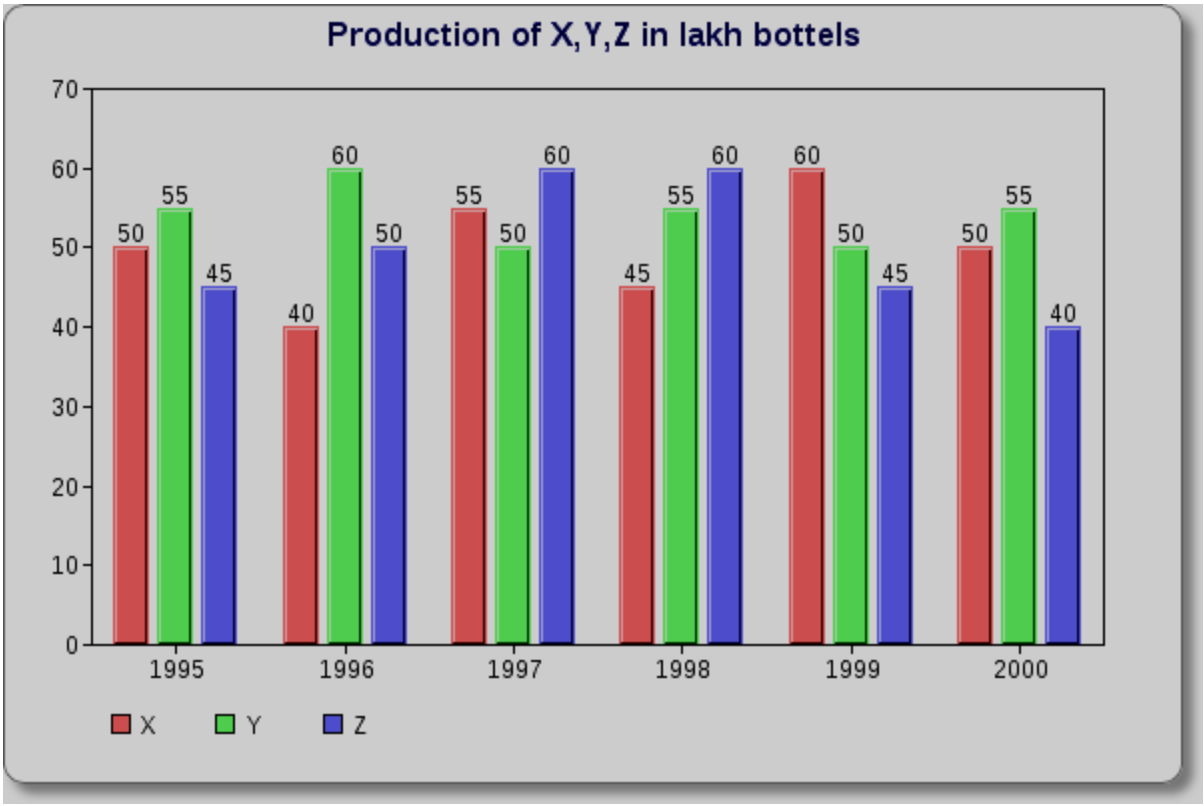
A) 1527 A.D. B) 1528 A.D. C) 1526 A.D. D) 1525 A.D.

69. Connection or link to other documents or web pages that contain related information is called:

A) Dial-up B) Electronic Commerce

C) Hyperlink D) E-cash

(Q70. To Q74.) A soft drink company prepares drinks of three different flavours X, Y and Z. The production of the three flavours over a period of six years has been expressed in the form of bar graph below. Study the bar graph and answer the question based on graph.



70. For which year the percent (rise/fall) in production from the previous year is the maximum for the flavour Y ?

A) 1996 B) 1997 C) 1998 D) 1999

71. For which flavour was the average annual production maximum in given period of time?

A) Z B) X C) Y D) X and Z

72. The total production of flavour Z in 1997 and 1998 is what percent of the total production of flavour X in 1995 and 1996 ?

A) 125.33% B) 128.33% C) 131.33% D) 133.33%

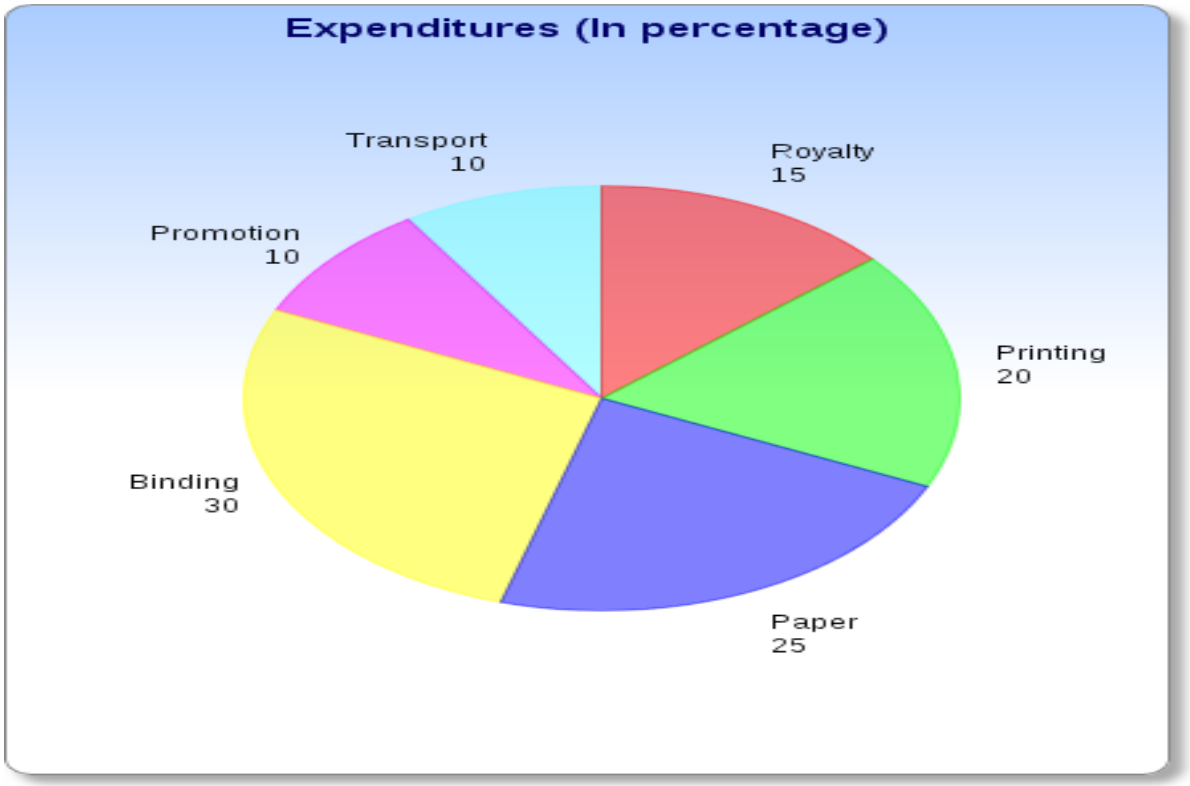
73. What is the difference between the average production of flavour X in 1995, 1996 and 1997 and the average production of the flavour Y in 1998, 1999 and 2000 ?

A) 50,000 bottles B) 55,000 bottles C) 1,000,00 bottles D) 1,100,00 bottles

74. What was the approximate decline in the production of flavour Z in 2000 as compared to production in 1998?

A) 30% B) 31% C) 32% D) 33%

(Q75. To Q81) The following pie chart shows the percentage distribution of the expenditure incurred in publishing a book. Study the pie chart and answer the following questions.



75. What is the central angle of the sector corresponding to the expenditure incurred on Royalty?

A) 54 degree B) 48 degree C) 45 degree D) 40 degree

76. Which two expenditures together have a central angle of 108 degree in pie chart?

A) Binding cost + Royalty cost B) Printing cost + Paper cost
C) Binding cost + Transportation cost D) Printing cost + Transportation cost

77. If the difference between the two expenditures is represented by 18 degree in the pie chart, then which option of following can be correct?

A) Binding cost and Royalty cost B) Paper cost and Printing cost
C) Paper cost and Royalty D) Royalty and Promotion cost

78. If for a edition of a book, the cost of paper is Rs. 56250, then find the promotion cost for this edition?

A) Rs 21500 B) Rs 22300 C) Rs 22500 D) Rs 22700

79. If for the certain quantity of books, the publisher has to pay Rs 30,600 as printing cost, then what will be the amount of royalty to be paid for these books?

A) Rs 22650 B) Rs 22750 C) Rs 22850 D) Rs 22950

80. If 5500 copies are published and the transportation cost on them amounts to Rs. 82500, then what should be the selling price of the book so that the publisher can earn a profit of 25 %?

A) Rs 180.50 B) Rs 182.50 C) Rs 183.50 D) Rs 187.50

81. Royalty on the book is less than the printing cost by?

A) 20% B) 25% C) 30% D) 35%

Directions for questions 82 to 85 Read the short passages below and answer the questions:

Care should be taken when submitting manuscripts to book publishers. A suitable publisher should be chosen, by a study of his list of publications or an examination in the bookshops of the type of books in which he specializes. It is a waste of time and money to send the typescript of a novel to a publisher who publishes no fiction, or poetry to one who publishes no verse, though all too often this is done. A preliminary letter is appreciated by most publishers, and this should outline the nature and extent of the typescript and enquire whether the publisher would be prepared to read it (writers have been known to send out such letters of enquiry in duplicated form, an approach not calculated to stimulate a publisher's interest). It is desirable to enclose the cost of return postage when submitting the typescript and finally it must be understood that although every reasonable care is taken of material in the Publishers' possession, responsibility cannot be accepted for any loss or damage thereto.

Authors are strongly advised not to pay for the publication of their work. If a MS. is worth publishing, a reputable publisher will undertake its publication at his own expense, except possibly for works of an academic nature. In this connection attention is called to the paragraphs on Self-publishing and vanity publishing, at the end of this section.

82. In view of the writer –

A) The publisher will stick to his line of publication only.

B) The publisher, who does not publish the other books, may not understand the ingredients and pattern of publication.

C) Publisher will not devote time to the Editing and reading the material which is not of its line of publication.

D) Any publisher, not publishing the stuff of other type will not be able to do justice with the manuscript.

83. As per the passage

A) Introductory letter, as it helps in publication, must be invariably sent.

B) The letters must have the contents in detail, to make the publisher read the same while devoting sufficient time.

C) A well worded & concise letter must be sent with manuscript to enable the publisher to have a glimpse of the manuscript.
D) More than one copy of the Preliminary/introductory letter must be submitted.

84. According to the writer

A) Paying for the publication expenses will help in publication of the manuscript.
B) Although the publisher would pay for the return expenses, no publication expenses will be borne by the publisher.
C) Reputed publisher would publish the manuscript on its own expenses.
D) Good publishers sometimes defer the publication according to the demand

85. Give the suitable Central idea of the passage

A) Manuscripts when sent for publication must have preliminary letter in more than one copy with cost of publication.
B) Manuscripts must be submitted to reputed publisher, who publishes the material of that kind with a brief letter and cost of return expenses.
C) The manuscripts before submission, must be personally discussed with the publishers, alongwith a letter and making it clear with him that only a part of publication expenses will be borne by the writer.
D) While submitting the manuscripts for publication, all the details are to be made abundantly clear with the publisher in writing alongwith the share of expenses. Any reputed publisher can be selected who may publish the manuscript.

x-x-x

M.P.Ed.

1. Word 'Athlete' means:
A. The Slave
B. The Winner
C. The contestant
D. The strong individual

2. The term 'double fault' is used in:
A. Badminton
B. Table Tennis
C. Tennis
D. Volley Ball

3. In which position the pressure on the vertical discs is greatest?
A. Stand upright
B. Seated
C. Supine lying
D. Prone lying

4. McDonald test is used in:
A. Volleyball
B. Soccer
C. Lawn Tennis
D. Basketball

5. First meeting of International Olympic Committee was held in:
A. Greece
B. Sweden
C. France
D. Athens

6. Sports top form depends on:
A. Diet
B. Training
C. Equipments
D. Psychological limits

7. Which of the following movements does not perform by elbow joint?
A. Flexion
B. Extension
C. Rotation
D. Pronation

8. What type of tissue is bone marrow?
A. Adipose
B. Connective
C. Areolar
D. Cellular

9. Posture is an index of an individual's:
A. Fitness
B. Heath
C. Personality
D. Character

10. The first step in the treatment of sports injuries is:
A. Thermotherapy
B. Hydrotherapy
C. Cryotherapy
D. Electrotherapy

11. Knee joint is formed with the following bones:

A. Femur, Tibia, Fibula
B. Tibia, Radius, Fibula
C. Femur, Radius, Ulna
D. Femur, Fibular, Ulna

12. In a certain code, ROUNDS is written as RONUDS. How will PLEASE will be written in the same code:
A. PALESE
B. PLASEE
C. LPAESE
D. PLAESE

13. Which is not the law of learning?
A. Law of Reaction
B. Law of Readiness
C. Law of Effect
D. Law of Exercise

14. Duration of meso-cycle can be:
A. 12 months
B. 3 - 6 weeks
C. Less than 3 months
D. 3-9 months

15. Calliper measured:
A. Weight
B. Height
C. Circumference
D. Width

16. A faster adaptation process occurs to:
A. Beginners
B. Moderate performers
C. High performers
D. Experienced performers

17. Which of the following is not related to the school health programme:
A. Health Education
B. Cure disease
C. Keeping Health Records
D. Hygiene

18. Seeking of 'Truth, Beauty an Goodness' is aim of :
A. Pragmatism
B. Naturalism
C. Realism
D. Idealism

19. In a certain code, FHQK means GIRL. How will WOMEN be written in the same code?
A. VNLDM
B. FHQKN
C. XPNFO
D. VLNDM

20. Teacher uses visual-aids to make learning:
A. Interesting
B. Simple
C. More knowledgeable
D. Quicker

21. 'Pyknic' is one of the body types as classified by:
A. Kretchmer B. Thorndike
C. Sheldon D. Bucher

22. Identify the disease which is referred to as Hypokinetic:
A. Rheumatic arthritis B. Malaria
C. AIDS D. Encephalitis

23. Which one of the following is not a communicable disease?
A. Malaria B. AIDS
C. Small Pox D. Measles

24. Distance from last hurdle to finish line in 100m hurdles is
A. 9.14m B. 8.50m
C. 14.02m D. 10.50m

25. The greater number of white muscle fibre are found in:
A. Marathon Runner B. Sprinter
C. Middle Distance Runner D. Cross-Country Runner

26. Active site of energy production in the cell is:
A. Nucleus B. Mitochondria
C. Chromosomes D. Golgi Apparatus

27. For muscle contraction the immediate source of energy is:
A. Blood Glucose B. ATP
C. Phosphocreatine D. Glycogen

28. When one type of training improves one factor only, the principle is called:
A. Specificity of load B. Simplicity of load
C. Complexity of load D. Individuality of load

29. Which institute ranked first in the National Institute Ranking Framework 2019?
A. IIT Delhi B. JNU
C. IISc Bangalore D. IIT Madras

30. Which of the following is not the Method of Research?
A. Observation B. Historical
C. Survey D. Philosophical

31. The best methods of sports administration is:
A. Laissez Faire B. Dictatorial
C. Autocratic D. Democratic

32. Name the smallest bone in the human body

A. Pesiform B. Scaphoid

C. Malleus D. Stapes

33. Which Hepatitis is slow killer?

A. Hepatitis-A B. Hepatitis-B

C. Hepatitis-C D. Hepatitis-D

34. Which of the following is considered as genetic endowment?

A. Endurance B. Speed

C. Strength D. Flexibility

35. 'RICE' is the first step of

A. Surgical treatment B. First-aid

C. Rehabilitation D. Later management of sports injury

36. Vitamin B_1 is also known as:

A. Calcium B. Thiamine

C. Phosphorus D. Potassium

37. If MOHAN is represented by the code KMFYL, then COUNT will be represented by:

A. AMSLR B. MSLAR

C. MASRL D. SAMLR

38. The research where the investigator can manipulate treatments to cause things happen is:

A. Experimental research B. Analytical research

C. Qualitative research D. Descriptive research

39. The deficiency of insulin in the body causes:

A. Rickets B. Asthma

C. Diabetes D. Allergy

40. Cardio respiratory efficiency is best measure through:

A. John-Methany test B. Harvard Step test

C. Indiana Motor Fitness Test D. JCF test

41. Which of the following is also called Hansen's disease?

A. Tuberculosis B. Chickenpox

C. Hepatitis B D. Leprosy

42. The instrument used for measuring body composition is:

A. Manometer B. Goniometer

C. Flexometer D. Skin fold caliper

43. Gladiator sport was the most popular past-time of the people of :
A. Athens B. Sparta
C. Ayodhya D. Rome

44. The primary focus of Supervision must always be the:
A. Maintenance of records B. Competition programme
C. Equipment management D. Learning situation

45. The missing numbers in the series 40, 120, 60, 180, 90, ? , 135 is:
A. 110 B. 270
C. 105 D. 210

46. The guided-missile destroyer, which was launched into water at the Mazagon Docks in Mumbai on April 2, 2019 is _____
A. INS Mysore B. INS Mumbai
C. INS Imphal D. INS Mormugao

47. The ability to exert maximum muscular force in minimum possible time is called:
A. Reactive Strength B. Muscular Endurance
C. Muscular Strength D. Muscular Power

48. Effective teaching skill is influenced by numerous factors, dominant among them is:
A. Weather B. Particular Activity
C. Equipment D. Group Size

49. Newton's first law of motion is known as :
A. Law of Reaction B. Law of effect
C. Law of Inertia D. Law of Mementum

50. Dick Fosbury who invented the 'Fosbury Flop' style in high jump event belongs to:
A. USA B. England
C. Russia D. Ukraine

51. 'Synthetic track' in athletics was used for the first time in
A. 1968 (Mexico Olympics) B. 1948 (London Olympics)
C. 1896 (Athens Olympics) D. 1996 (Atlanta Olympics)

52. When a tennis player attempts to learn golf it is:
A. Positive transfer B. Negative transfer
C. Zero transfer D. Systematic transfer

53. The important nutrient found in fish is

A. Zinc B. Vitamin K

C. Copper D. Omega-3

54. Which sprinter is nicknamed the Bath Bullet?

A. Jesse Owens B. Jason Gardener

C. Mike Powel D. Asapa Powel

55. Which of the following events is not included in Heptathlon?

A. High Jump B. 100m sprint

C. Discus Throw D. Javelin Throw

56. When was the first female athlete allowed to compete in the Olympics?

A. 1896 B. 1900

C. 1904 D.1908

57. Who has topped the Civil Services Examination 2018?

A. Akshat Jain B. Junaid Ahmad

C. Kanishak Kataria D. S. Jayant Deshmukh

58. If A stands for 5, B for 6, C for 7, D for 8, and so on, what do the following numbers stand for:

22, 25, 8, 22 and 5 ?

A. PRIYA B. NEEMA

C. MEENA D. RUDRA

59. In second class lever, resistance is located between:

A. Fulcrum and Force B. Fulcrum and Resistance

C. Force and Resistance D. None of the above

60. If the BLOOD is coded as 24113 and BRUST as 20678, then code for ROBUST is:

A. 012478 B. 012678

C. 012674 D. 012468

61. Wet Spirometer is used for the measurement of :

A. Blood Pressure B. Oxygen Intake

C. Pulse Rate D. Vital Capacity

62. All India Council of Sports was formed in:

A. 1953 B. 1954

C. 1951 D. 1952

63. Free hand exercises done generally in group are called

A. Circuit training B. Calisthenics

C. Drill and marching D. Weight training

64. An instrument for measuring height:

A. Goniometer B. Spirometer

C. Stadiometer D. Flexometer

65. An ectomorph individual has a

A. Bulky and stocky body B. Muscular and athletic body

C. Thin and lender frame D. Body beautiful image

66. The Government established the University Grants Commission (UGC) by an Act of Parliament in the year:

A. 1980 B. 1956

C. 1950 D. 1958

67. Which number is missing in the following series?

2, 5, 10, 17, 26, 37, 50, ?

A. 63 B. 69

C. 67 D. 65

68. Choose the odd word:

A. Nun B. Monk

C. Knight D. Priest

69. What will be the next term in the following: DCXW, FEVU, HGTS,?

A. AKPO B. ABYZ

C. JIRQ D. LMRS

70. Sum of all values divided by the numbers in that series is:

A. Median B. Average

C. Mean D. Mode

71. In April 2019, Volodymyr Zelensky has been elected president of:

A. France B. Israel

C. Ukraine D. Mexico

72. When was Government College of Physical Education (Hyderabad) established?

A. 1942 B. 1931

C. 1930 D. 1937

73. Which sport is known as ‘Payattu’ in Kerala

A. Kung-fu B. Tae Kwando

C. Judo D. Karate

74. Value education makes a student:

A. Successful businessman B. Popular Teacher
C. Good citizen D. Efficient manager

75. Which of the following statements is most appropriate?

A. Teachers can teach.
B. Teachers help can create in a student a desire to learn.
C. Lecture Method can be used for developing thinking.
D. Teachers are born.

x-x-x

MSc(HS)(Geology)

1. A sand zone that connects an island or rock to mainland is called
   (A) Tombolo
   (B) Berm
   (C) Cusp
   (D) Groin

2. Which of the following pairs in not correctly matched?
   (A) Deflation Hollows: Deserts
   (B) Rock Pedestals: Deserts
   (C) Yardang: Deserts
   (D) Kettle: Deserts

3. Which one of the following is not a feature of glacial erosion?
   (A) Cirques
   (B) Grooves and Striation
   (C) V-shaped valley
   (D) U-shaped valley

4. Mohorovicic discontinuity under the continents usually occurs at a depth of
   (A) 5 km
   (B) 15 km
   (C) 25 km
   (D) 35 km

5. Unconsolidated deposits of pyroclastic debris that have been erupted from a volcano is called
   (A) Scoria
   (B) Tephra
   (C) Lapilli
   (D) Pumice

6. How many minerals are Ca-bearing in the Mohs scale of hardness?
   (A) Five
   (B) Four
   (C) Three
   (D) Two

7. Which of the following are the biaxial crystal systems?
   (A) Orthorhombic-Monoclinic-Triclinic
   (B) Orthorhombic-Monoclinic-Tetragonal
   (C) Tetragonal-Hexagonal-Trigonal
   (D) Tetragonal-Hexagonal-Isometric

8. Which one of the following minerals is characterised by irregular form, no cleavage, high relief and parallel extinction

(A) Quartz
(B) Garnet
(C) Olivine
(D) Fluorite

9. Which one of the following oxides are referred to as network formers?
(A) BaO & CaO
(B) K_2O & Na_2O
(C) SiO_2 & Al_2O_3
(D) Mgo & FeO

10. In which of the following minerals, the cleavages meet at an angle of 124^o in the basal section?
(A) Jadeite
(B) Acmite
(C) Omphacite
(D) Grunerite

11. Which of the following REEs exist in valance state other than +3?
(A) Eu and La
(B) Eu and Ce
(C) Eu and Nd
(D) Eu and Sm

12. The abundance of garnet in the source is indicated by
(A) Negative slope of LREE
(B) Negative slope of HREE
(C) Flat LREE pattern
(D) Flat HREE pattern

13. $^{12}_{7}N$ decays to $^{12}_{6}C$ by
(A) Negatron decay
(B) Positron decay
(C) Alpha decay
(D) Electron capture

14. Which one of the following isotopic methods is best suited to date garnet?
(A) Rb-Sr
(B) K-Ar
(C) Ar-Ar
(D) Sm-Nd

15. Which one of the following meteorites is considered to be most primitive in the solar system?
(A) Chondrites
(B) Achondrites
(C) Iron meteorites

(D) Stony-iron meteorites

16. On flat topography, the outcrop width of a bed is 50 m. If the true dip of the bed is 30°, the actual thickness of the bed will be
(A) 100 m (B) 25 m (C) 20 m (D) 15 m

17. If the angle of plunge of a fold is 45° and dip of axial surface is 45°, then the fold is
(A) Reclined
(B) Moderately inclined
(C) Gently plunging
(D) Moderately plunging

18. Which one of the following is not associated with convergent plate boundary?
(A) Back arc
(B) Fore arc
(C) Ridge
(D) Trench

19. Which type of faulting is responsible for the formation of horst and graben structure?
(A) Reverse
(B) Normal
(C) Strike-slip
(D) Dip-slip

20. According to V-rule, the vertical beds
(A) Do not vee
(B) Vee upstream
(C) Vee downstream
(D) Do not have straight outcrop

21. In the QAP diagram, what will be the name of plutonic igneous rock containing 35% quartz, 5% alkali-feldspar and 60% plagioclase?
(A) Granite
(B) Granodiorite
(C) Tonalite
(D) Diorite

22. The texture involving albitic plagioclase overgrowths on orthoclase in granite is called
(A) Myrmekitic
(B) Perthitic
(C) Rapakivi
(D) Graphic

23. Alkaline rocks are characteristics of
(A) Continental rift
(B) Collision zone
(C) Continental arc

(D) Island arc

24. Which of the following minerals are characteristic of strongly peraluminous granites?
    (A) Hornblende-Biotite (B) Hornblende-Riebeckite
    (C) Muscovite-Garnet (D) Muscovite- Riebeckite

25. Which one of the following is not a lamprophyre?
    (A) Polzenite
    (B) Vogsite
    (C) Spessartine
    (D) Minette

26. Which one of the following pairs is not correctly matched?
    (A) Amphibolite: Basalt
    (B) Khondalite: Shale
    (C) Clay-sand mixture: Marl
    (D) Quartz sand: Quartzite

27. Which one of the following rocks occurs in a brittle fault zone?
    (A) Breccia
    (B) Mylonite
    (C) Pseudotachylite
    (D) Ultramylonite

28. The formation of secondary foliation in a rock is due to
    (A) Deviatoric stress
    (B) Lithostatic pressure
    (C) Hydrostatic pressure
    (D) Confining pressure

29. What is the sense of shearing in the S-type snowball garnet?
    (A) Clockwise, Sinistral
    (B) Clockwise, Dextral
    (C) Anticlockwise, Dextral
    (D) Anticlockwise, Sinistral

30. Anticlockwise P-T-t paths are characterised by
    (A) Subduction-zone tectonics
    (B) Extensional tectonics
    (C) Attainment of P_{max} and T_{max} at the same time
    (D) Attainment of P_{max} before T_{max}

31. A well-sorted sedimentary rock having about 2% matrix, 96% quartz, 1% feldspars and 1% lithic fragments in carbonate cement is known as
    (A) Feldspathic arenite
    (B) Quartz arenite

(C) Greywacke
(D) Lithicwacke

32. Which one of the following designates fragments of generally weakly cemented carbonate sediment that has been broken up and redeposited in a new framework?
(A) Grapestone
(B) Pellets
(C) Intraclast
(D) Micrite

33. What one of the following factors inhibits the precipitation of carbonates in sea water?
(A) Increase in depth
(B) High evaporation rates
(C) Lowering of total pressure
(D) Rise in water temperature

34. Which one of the following decreases in a downstream direction?
(A) Discharge
(B) Channel shape and size
(C) Water volume
(D) Particle size

35. Which one of the following sedimentary structures cannot be used to delineate top and bottom of beds?
(A) Graded bedding
(B) Cross bedding
(C) Current ripple marks
(D) Oscillatory ripple marks

36. Which one of the following features is not associated with Brachiopods?
(A) Pedicle valve
(B) Umbo
(C) Growth lines
(D) Muscle scars

37. Which one of the following invertebrate is characterised by a water vascular system, non-centralized nervous system and a calcareous skeleton of plates developed from the mesoderm?
(A) Mollusca
(B) Annelida
(C) Echinodermata
(D) Coelenterata

38. Which one of the following organisms was most abundant in the Mesozoic sea?
(A) Bryozoa
(B) Ammonites
(C) Brachiopoda

(D) Tetracorals

39. Fossilized nests, gastroliths, footprints and burrows are known as
(A) Trace fossils
(B) Body fossils
(C) Mold fossils
(D) Cast fossils

40. As index fossils, brachiopods were important during the
(A) Late Cretaceous (B) Early Jurassic
(C) Middle Jurassic (D) Late Paleozoic

41. Which of the following stratigraphic units has the correct chronological order?
(A) Bababudan Group-Nallamalai Group-Subathu Formation-Damuda Group
(B) Bababudan Group-Nallamalai Group-Damuda Group-Subathu Formation
(C) Nallamalai Group-Subathu Formation-Damuda Group-Bababudan Group
(D) Nallamalai Group-Damuda Group-Subathu Formation-Bababudan Group

42. The Syringothyris Limestone belongs to
(A) Early Carboniferous
(B) Middle Carboniferous
(C) Earlier Permian
(D) Middle Permian

43. Which tectonic boundary separates the Indian plate from Eurasian plate?
(A) South Tibetan Detachment Fault
(B) Indus Tsangpo Suture zone
(C) Karakoram fault zone
(D) Zanskar shear zone

44. The age of Patcham Formation is
(A) Upper to Lower Oxfordian
(B) Lower Callovian to Bathonian
(C) Upper Oxfordian to Middle Tithonian
(D) Upper Neocomian to Lower Aptian

45. The rocks of Debari Group occur in the cratonic block of
(A) Dharwar
(B) Singhbhum
(C) Bastar
(D) Aravalli

46. Pedosols are soils with high content of
(A) Magnesium
(B) Lime
(C) Sodium
(D) Potassium

47. The factor that does not substantially effects the rate of runoff of rain fall is
    (A) Soil profile
    (B) Slope of topography
    (C) Altitude
    (D) Surface vegetation

48. Which one of the following is a product of alternate phase of expansion and contraction caused by heating and cooling, wetting and drying and burrowing activities of organism?
    (A) Heave
    (B) Slides
    (C) Debris flow
    (D) Cavity collapse

49. Mature Karst topography is characterised by
    (A) An arid climate
    (B) Pedocal soil
    (C) Underground drainage
    (D) Extremely rugged terrain

50. Bifurcation ratio is defined as the ratio of
    (A) The number of streams of higher order to that of lower order
    (B) The number of streams of lower order to that of higher order
    (C) The number of stream branches of a given higher order to the number of streams of preceding order
    (D) The number of stream branches of a given lower order to the number of stream branches of next higher order

51. The host rocks for the Khetri copper deposits belong to
    (A) Aravalli Supergroup
    (B) Delhi Supergroup
    (C) Vindhyan Supergroup
    (D) Marwar Supergroup

52. The locality, Singrauli in Madhya Pradesh, is known for
    (A) Uranium
    (B) Lignite
    (C) Bituminous coal
    (D) Petroleum

53. The host rocks for gold in Kolar Gold Mines is
    (A) Granite
    (B) Amphibolite
    (C) Dolomite
    (D) Schist

54. Which one of the following ore minerals shows granular form, black colour, brown streak, no cleavage and high specific gravity?

(A) Galena
(B) Sphalerite
(C) Magnetite
(D) Chromite

55. What is the main process responsible for the formation of iron deposits?
(A) Mechanical concentration
(B) Metamorphism
(C) Residual concentration
(D) Chemical sedimentation

56. The age of Neyveli lignite deposit is
(A) Oligocene (B) Miocene
(C) Pliocene (D) Palaeocene

57. Which one of following traps has produced greatest amount of oil?
(A) Unconformity (B) Anticline
(C) Faults (D) Combination of traps

58. Which of the following countries has the largest proven oil reserves?
(A) Russia (B) Saudi Arabia
(C) Kuwait (D) Venezuela

59. The increase in grade of coal is primarily a function of
(A) Decreasing heat
(B) Time span of surface exposure
(C) Increasing grade of metamorphism
(D) Type of organic matter

60. Which one of the following building stones is not resistant to weathering?
(A) Granite (B) Gabbro
(C) Limestone (D) Sandstone

61. Under what condition, the compressive strength of the material will be low?
(A) If cementing material is entirely clay
(B) If cementing material is entirely siliceous
(C) When compressive stress is perpendicular to strata
(D) When compressive stress is parallel to strata

62. Which one of the following rock types is suitable for construction of any river valley project?
(A) Shale and conglomerate (B) Laterites and conglomerate
(C) Well cemented siliceous sandstone (D) Highly porous limestone

63. The slow and continuous downward movement of unconsolidated earth material is called
(A) Soil creep (B) Rock fall
(C) Rock slide (D) Mudflows

64. In what scale pH is measured?

(A) Logarithmic (B) Exponential
(C) Linear (D) Relative

65. What is the desirable limit of Total Dissolved Salts (TDS) in safe drinking water?

(A) >1000 ppm (B) 700-1000 ppm
(C) 500-700 ppm (D) < 500 ppm

66. Which one of the following represents an aquiclude?

(A) Alluvium sand (B) Clay
(C) Sandy clay (D) Granite

67. Which one of the following is correctly matched?

(A) Transmissivity: metre
(B) Hydraulic Resistivity: $metre^2/day$
(C) Leakage Factor: day
(D) Specific Storage: $metre^{-1}$

68. Which one of the following logs records the radioactivity of rock formations?

(A) SP Log (B) Gamma Ray Log
(C) Resistivity Log (D) Calliper Log

69. Which one of the following corrections is applied to remove the effect of elevation on the Earth's gravity value?

(A) Free Air (B) Bouguer
(C) Terrain (D) Eötvös

70. Which one of the following is expressed in milligals (mGal) unit?

(A) Rotation of the Earth
(B) Rotation of the Moon
(C) Gravitational acceleration of the Earth
(D) Gravitational acceleration of the Moon

71. The difference between the Magnetic North and Geographic North of the Earth is

(A) 400 km (B) 999 km
(C) 600 km (D) 298 km

72. The lines of constant latitude are called

(A) Meridians (B) Parallels
(C) Equator (D) Longitude

73. GNSS stands for

(A) Geological Norms for Satellite System
(B) Geological Navigation Satellite System
(C) Global Norms for Satellite System
(D) Global Navigation Satellite System

74. What is the first and most important requirement for remote sensing?

(A) Target (B) Energy Source

(C) Sensor (D) Medium

75. Name the three components of atmosphere that are responsible for absorption of radiation

(A) Ozone, Oxygen, Water Vapour

(B) Ozone, Carbon dioxide, Water Vapour

(C) Oxygen, Carbon dioxide, Dust particles

(D) Oxygen, Ozone, Dust particles

x-x-x

MSc(2Yr)(Environment Science)

1. Haemoglobin in blood contains which of the following element?
   A) Aluminium B) Magnesium C) Iron D) Calcium

2. Which of the following is referred to 'Biodiesel Plant'?
   A) Neem B) Banyan C) Sisham D) Jatropha

3. Sulphur dioxide in atmosphere is responsible for acid deposition. Which of the following is NOT a major source of SO_2?
   A) Emissions from paddy fields B) Emissions from thermal power plant
   C) Burning of fuel wood D) Burning of fossil fuel

4. What is the transition area between two biomes called?
   A) Habitat B) Ecotone C) Ecotype D) Community

5. Lentic ecosystem refers to
   A) Static water system B) Terrestrial flowing water
   C) Ecosystem of straits D) Deep marine water system

6. Which of the following countries will host World Environment day, 2019?
   A) India B) Pakistan C) China D) Australia

7. Which of the following greenhouse gases has the greatest heat-trapping ability per molecule?
   A) CO_2 B) CH_4 C) NO D) SF_6

8. Which of the following ecological pyramid is always upright?
   A) Pyramid of number B) Pyramid of energy
   C) Pyramid of biomass D) Pyramid of species richness

9. Thermal pollution in natural streams can be reduced by
   A) Installing chimneys
   B) Using electronic thermometers
   C) Using Dissolved Oxygen Meters
   D) Installing adequate cooling towers or ponds

10. What is the term for the complete disappearance of a species?
    A) Extinction B) Endangered C) Abundance D) Affluence

11. Our bone and teeth are generally made up of
    A) Calcium sulphate B) Fluorapatite
    C) Calcium phosphate D) Calcium oxalate

12. Which of the following are the most abundant rocks found on the crust of the earth?
    A) Sandstone and limestone B) Granite and basalt
    C) Limestone and gypsum D) Gypsum and shale

13. When the human species are divided on the basis of physical characteristics that are inherited, it is called
A) Race B) Ethnicity C) Cultural Pride D) Society

14. Ethnocentrism refers to
A) Appreciating cultural traits of other people
B) The belief in the inherent superiority of one's own ethnic group or culture
C) The tendency of a cultural group to uphold and sustain traditional culture
D) The attempt to modernize traditional culture

15. Which of the following possess maximum moons/satellites in our solar system?
A) Saturn B) Jupiter C) Neptune D) Mars

16. The difference between polar and equatorial diameter of earth is
A) 23 km B) 33 km C) 43 km D) 53 km

17. Exfoliation is a type of
A) Physical weathering B) Chemical weathering
C) Biological weathering D) Mass Wasting

18. River piracy is a feature which is more active in its _____ stage.
A) Incipient B) Mature C) Youth D) Old

19. Consider the following States
1. Arunachal Pradesh
2. Himachal Pradesh
3. Mizoram
In which of the above States do 'Tropical Wet Evergreen Forests' occur?
A) 1 only B) 2 and 3 only C) 1 and 3 only D) 1, 2 and 3

20. Which of the following is the only mineral component of chlorophyll?
A) Carbon B) Hydrogen C) Calcium D) Magnesium

21. From which part of the plant is 'clove', a commonly used spice, obtained?
A) Flower bud B) Root C) Stem D) Fruit

22. Which amongst the following countries is considered to have the world's 1st sustainable bio fuel economy?
A) Australia B) Brazil C) China D) India

23. The stratospheric ozone is considered as a friend of living being. The thickness of this layer is measured in
A) Candela B) Watts C) Decibels D) Dobson

24. Which of the following is NOT a component of sustainable agriculture?
A) Social & economic equality B) Social Justice

C) Environmental health D) Economic profitability

25. Which of the following formation neither contains water nor transmits water?
A) Aquifer B) Aquitard C) Aquiclude D) Aquifuge

26. A device fitted to vehicles to chemically reduce gases like NO_x, CO and hydrocarbons by internal combustion into less harmful products is called
A) Catalytic converter B) Carburetor
C) Tail pipe D) 2- stroke engine

27. India's first national park, Hailey National Park is now known as
A) Kaziranga National Park B) Jim Corbett National Park
C) Ranthambore National Park D) Nokrek Biosphere Reserve

28. What is the angle between the hands exactly at 4:40 PM?
A) 120^o B) 100^o C) 280^o D) 240^o

29. The middle value of ordered array of numbers is called
A) Mean B) Mode C) Median D) Standard deviation

30. Population Census is conducted through
A) Sample survey B) Accounting
C) Complete Enumeration D) Partial Enumeration

31. The first hand and unorganized set of data is called
A) Primary data B) Secondary data C) Fictitious data D) Dubious data

32. The number of students in a class in a particular year is a
A) Discrete data B) Hypothetical data
C) Continuous data D) Qualitative data

33. Nelong valley, which was opened for tourists in 2015, first time since 1962 is situated in
A) Sikkim B) Uttrakhand C) Manipur D) Mizoram

34. Which of the following India's biosphere MISSES a mention in UNESCO's 'Man and Biosphere' list?
A) Nokrek B) Nicobar C) Sunderbans D) Manas

35. Odisha state's disaster preparedness and zero causality policy during the recent devastating cyclonic storm was appreciated by United Nations. This cyclone was named as
A) Fani B) Fenny C) Fury D) Funny

36. An alignment of three celestial objects like sun, earth and moon in the straight line is called
A) Syzygy B) Conjunction C) Aphelion D) Perigee

37. The oceanic zone between 40^o to 60^o in both the hemispheres record

A) High salinity B) Low salinity C) Moderate salinity D) Zero salinity

38. The Richter's scale used to record earthquake intensity is a
A) Linear Scale B) Parabolic Scale C) Geometric Scale D) Logrithmic Scale

39. Tritium is an isotope of
A) Helium B) Berillium C) Terullium D) Hydrogen

40. Which of the following sound waves are used in echo cardio-graphy?
A) Ultrasonic B) Infrasonic
C) Between 20 Hz to 2000 Hz D) Between 20 Hz to 20,000 Hz

41. In which of the following dispersed phase is a solid and dispersion medium is a liquid?
A) Foam B) Solid Foam C) Sol D) Emulsion

42. Which of the following transitions are studied by UV Spectrometer?
A) Rotational B) Electronic C) Nuclear D) Vibrational

43. The compressibility factor of an ideal gas is
A) >1 B) <1 C) 1 D) 0

44. Which of the following weather condition is indicated by the fall of barometer reading?
A) Stormy B) Calm C) Cold and dry D) Hot and dry

45. The normal rainfall in clean atmosphere at mean sea level is _____ in nature.
A) Neutral B) Alkaline C) Acidic D) May be acidic or alkaline

46. For the ecological balance, the forest cover should be at least ____ of the total geographical area of a country.
A) 23% B) 33% C) 43% D) 53%

47. Which of the following relates to 'sustainable development'??
A) Kyoto Protocol B) Brundtland Report
C) Paris Agreement D) Montral Protocol

48. Estuaries possess distinct blooms excessive growth of pigmented dianoflagellates. These blooms are referred to
A) Red tides B) Blue tides C) Green tides D) Black tides

49. Which of the following is present in the largest amount in terms of percent by mass in the earth's crust?
A) Silicon B) Oxygen C) Aluminium D) Magnesium

50. Which of the following layer of atmosphere is responsible for the deflection of radio waves?
A) Mesosphere B) Troposphere C) Stratosphere D) Ionosphere

51. The sum of three numbers is 98. If the ratio of first number to second is 2:3 and that of second to third is 5:8; the second number is
A) 20 B) 30 C) 40 D) 50

52. Which of the following is the force required to move a body uniformly in a circle?
A) Centripetal B) Centrifugal C) Linear D) Frictional

53. What is the apparent weight of a person when the elevator is accelerated downwards?
A) Same as actual weight B) More than actual weight
C) Less than actual weight D) Zero

54. What is the time taken by earth to complete one rotation about its axis with regard to a fixed star?
A) Tropical day B) Solar day C) Stellar day D) Sedrial day

55. The atomic clock is based on the periodic vibration produced in the atom of which element?
A) Caesium B) Barium C) Rubidium D) Titanium

56. What happens to the level of dissolved oxygen during eutrophic conditions in lakes?
A) Remains same B) Increases
C) Decreases D) May increase or decrease

57. The artificial sweetener containing chlorine that has the appearance and taste of sugar and is stable at the cooking temperature is
A) Saccharine B) Aspartame C) Sucrose D) Sucralose

58. 'Franken food' is a term synonym to
A) Junk food B) Organic food C) GM food D) Uncooked food

59. The 'ecomark' logo of India is
A) Tree twig B) Earthen pot C) Dove D) Peacock

60. The Environment (Protection) Act of India was enacted in the year
A) 1972 B) 1981 C) 1986 D)1996

61. What is the name of the agreement made between countries to reduce ozone depletion?
A) Environmental Protection Act B) Montreal Protocol
C) Rio Earth Summit D) Kyoto Protocol

62. Which of the following is NOT correctly matched?
A) World Water Day 22^{nd} of March
B) World Earth Day 22^{nd} of April
C) World Biodiversity Day 22^{nd} of May
D) World Environment Day 22^{nd} of June

63. Which one of the following is the national aquatic animal of India?

A) Saltwater crocodile B) Olive ridley turtle
C) Gangetic dolphin D) Gharial

64. Hydro-fluoric acid is not kept in glass bottles because it reacts with
A) Visible light B) Sodium oxide of glass
C) Aluminium oxide of glass D) Silicon dioxide of glass

65. If by mistake some radioactive substance gets into human body, then from the point of view of radiation damage, the most harmful will be one that emits
A) Gamma rays B) Neutrons C) Beta particles D) Alpha particles

66. Which one of the following is the best description of the term 'ecosystem'?
A) A community of organisms interacting with one another and their physical environment
B) That part of the Earth which is inhabited by living organisms.
C) A community of organisms without any interaction
D) The flora and fauna of a geographical area

67. H1N1 virus is sometimes mentioned in the news with reference to which one of the following diseases?
A) AIDS B) Bird flu C) Dengue D) Swine flu

68. Which of the following is NOT a weather element?
A) Humidity B) Air pressure C) Latitude D) Solar radiations

69. Ultimate source of energy for all living beings is
A) Fats B) Carbohydrates C) Amino acid D) Sunlight

70. pH value of potable water is
A) 10-11.5 B) 6.5-8.5 C) 3.5-5.5 D) 7.0- 10.0

71. Aurora Borealis occurs in the
A) Troposphere B) Stratosphere C) Mesospere D) Ionosphere

72. Which of the following is not a type of grassland?
A) Praries B) Savannas C) Pampas D) Himalayas

73. Hazardous waste should be disposed off in/ by
A) Sanitary landfill B) Secure landfill C) Open dumping D) Incineration

74. Which of the following lakes are poorly nourished and have low biological productivity?
A) Mesotrophic B) Oligotrophic C) Eutrophic D) Heterotrophic

75. Which of the following hosted the Convention on Wetlands in 1971?
A) Stockholm B) Kyoto C) Ramsar D) Montreal

x-x-x

MSc(2Yr)(Human Genomics)

1. Ramachandran Plot describes
A) Dihedral angles of side chains in amino acids
B) Dihedral angles of backbone of polypeptide
C) Dihedral angles of aromatic amino acids
D) Dihedral angles of nucleotides

2. Globular proteins have
A) Alpha helices only
B) Beta sheets only
C) Alpha helices and beta sheets
D) Alpha helices, beta sheets and loops

3. Hydrolysis of RNA takes place under alkaline conditions as
A) The 2' hydroxyl in RNA acts an nucleophile in an intramolecular displacement
B) The 3' hydroxyl in RNA acts as an nucleophile in an intramolecular displacement
C) The 2' hydroxyl in RNA acts an nucleophile in an intermolecular displacement
D) The 5' hydroxyl in RNA acts an nucleophile in an intermolecular displacement

4. Which enzyme is involved in protein folding?
A) Disulphide isomerise
B) Hydrolase
C) Kinase
D) Phosphatase

5. The tripeptide produced by the translation of the transcript of the 5'-AAGTACTCT-3' DNA sequence will be
A) Arg-Phe-Trp
B) Arg-Leu-Gly
C) Thr-lys-Ser
D) Phe-Met-Arg

6. Histones are rich in
A) Valine
B) Lysine
C) Arginine
D) Lysine and Arginine

7. An amino acid commonly used as an ingredient in the buffer for SDS-PAGE is
A) Valine
B) Glycine
C) Proline
D) Serine

8. Same DNA sequence may code for more than one polypeptide by
A) Gene splitting
B) Alternative splicing of mRNA
C) Recombination
D) Mutation

9. At pH below pI, amino acids will be
A) Positively charged
B) Negatively charged
C) Neutral
D) No charge

10. The side chain of histidine contains
A) Imidazole ring
B) Phenyl ring
C) Benzene ring
D) Porphyrin ring

11. Which of the following amino acid is optically inactive?
A) Serine
B) Valine
C) Glycine
D) Leucine

12. Which amino acid is least occurring amino acid in proteins?
A) Tyrosine B) Histidine C) Tryptophan D) Serine

13. A spiral structure that contains coiled and tightly packed polypeptide backbone core and side chains of component amino acids is named as
A) Linear sequence B) Double stranded structure
C) Helix D) Double stranded sheet

14. A single unit of amino acid is called
A) Monomer B) Dimer
C) Primary structure D) Single amino acid

15. A short, rigid and planner bond that link consecutive amino acids is named as
A) Peptide bond B) Hydrogen bond C) Covalent bond D) Sulphide bond

16. In case of low blood glucose concentration, the negative feedback is
A) To avoid sweets B) To workout
C) To rest D) Conversion of glycogen to glucose

17. Which of the following characteristic differentiate Eubacteria from Archaebacteria?
A) Circular nature of chromosome B) Absence of nuclear membrane
C) Presence of 70S ribosomes D) Presence of murein in cell wall

18. Rifampicin
A) Inhibits hepatic microsomal enzymes B) Inhibits DNA synthesis
C) Is bactericidal for mycobacteria D) Is not appreciably protein bound

19. Which of the following statements about fatty acids is correct?
A) Fatty acids are used as fuel molecules by all cells.
B) Fatty acids are oxidised to acetyl-CoA.
C) Fatty acids are hydrolysed to acetyl-CoA.
D) Fatty acids are converted to glucose in the liver.

20. Which of the following is true of the lac operon in E. coli?
A) The operon is only switched on in the absence of lactose in the growth medium.
B) The lac operon messenger RNA is a polycistronic mRNA (it carries information for synthesis of several proteins).
C) The enzyme β-galactosidase is only produced in large quantities when the lac repressor is bound to the operator.
D) The promoter is the binding site for the lac repressor

21. Which of the following statement concerning glucose metabolism is NOT CORRECT?
A) Conversion of glucose to pyruvate occurs in cytoplasm
B) Glu enters in intestinal cells by a mechanism in which Na+ and Glu are co-transported
C) Pyruvate kinase catalyzes a reversible reaction

D) Insulin binds to IRS and cause the GLUT transporter to recruit on plasma membrane

22. Binomial nomenclature refers to:
A) One Latin name and one vernacular name
B) One scientific name and one Latin name
C) One scientific name and one vernacular name
D) One generic name and one specific name

23. The restriction enzymes are also called :
A) Molecular markers B) Molecular scissors
C) Vectors D) Carriers

24. Bt toxin is coded by a gene named as:
A) cry B) bty C) tby D) dt

25. Which organ is called as the graveyard of RBC's?
A) Spleen B) Liver C) Pancreas D) Kidneys

26. Which of the following is an example of highly repetitive DNA?
A) Alu element B) Histone gene cluster
C) DNA minisatellite D) Dispersed repetitive DNA

27. In which region of the interphase chromosome does transcription take place?
A) Heterochromatin B) Euchromatin
C) The telomere D) The centromere

28. All enzymes are proteins except :
A) Ribozymes B) Kinase C) Dehydrogenase D) Transaminase

29. A by- product for forming a peptide bond from two amino acids is
A) Water B) Heat C) Carbon dioxide D) Energy

30. Which of the following is not part of protein structure?
A) Helices B) Sheets C) Loops D) Arches

31. Maltose is made up of
A) Two molecules of sucrose joined together
B) Two molecules of glucose joined together
C) One molecule of glucose joined to one molecule of fructose
D) One molecule of glucose joined to one molecule of galctose

32. Entropy in a biological system does not increase because:
A) It is an open system B) It is closed system
C) It is governed by vitalism D) It is related to thermodynamics

33. Popai, a scientific advisor of nina, went to moon and obtained few proteins on the lunar surface. When he returned to earth somehow, change in the environment, few amino acids got modified by chemical conversions. Which of the following changes in amino acids would have led to maximum alteration in the structure?

A) Serine to Threonine
B) Leucine to Isoleucine
C) Glutamate to Isoleucine
D) Histidine to Arginine

34. Ninhydrin test is given by

A) Carbohydrates B) Proteins C) Alkanes D) Alkenes

35. A nonsense mutation involves

A) A regulatory sequence
B) Creation of a stop codon
C) Frameshift
D) Deletion

36. In meosis, recombination occurs in

A) Prophase I B) Metaphase I C) Prophase II D) Metaphase II

37. The presence of two or more cell lines from different zygotes in a single individual is known as:

A) Mosaicism B) Diploidy C) Aneuploidy D) Chimaerism

38. Normal adult haemoglobin (Hb A. consists of:

A) Two α (alpha) and two β (betA. Chains)
B) Two α and two γ (gammA. Chains)
C) Two α and two δ (deltA. Chains)
D) Four γ chains

39. The mutation in sickle-cell disease consists of:

A) A deletion B) A duplication C) An insertion D) A point mutation

40. Gel-filtration chromatography separates proteins

A) On their ability to bind to specific groups on the column matrix
B) On the basis of molecular mass
C) On the basis of their molecular shape
D) On the basis of their charge

41. In reverse phase chromatography the wanted protein can be selectively eluted by

A) Solutions of different hydrophobicities or ionic strengths
B) Solutions of different pH
C) Solution of constant pH
D) Solution of constant ionic strength

42. The lipid and protein composition of inner and outer halves of the lipid layer are:

A) Identical B) Symmetrical C) Non identical D) Similar

43. Lateral movement of membrane lipids are

A) Absent
B) Catalysed by proteins
C) Catalysed by ATPases
D) Diffusion controlled

44. Membrane fluidity is increased when there is
A) High proportion of trans unsaturated fatty acids
B) High proportion of cis unsaturated fatty acids
C) Low proportion of trans unsaturated fatty acids
D) Low proportion of cis unsaturated fatty acids

45. Cell membranes are permeable to
A) Most inorganic ions
B) Few inorganic ions
C) None of the inorganic ions
D) Most inorganic and organic ions

46. Sacromere is a unit of
A) Myofibril
B) Protofibril
C) Topofibril
D) Keratin

47. Which ion has role in skeletal muscle contraction?
A) Magnesium
B) Cadmium
C) Calcium
D) Chromium

48. Protein digestion begins in
A) Stomach
B) Small intestine
C) Buccal cavity
D) Oesophagus

49. Starch digestion begins in
A) Stomach
B) Buccal cavity
C) Oesophagus
D) Small intestine

50. Among Fat and Glycogen
A) Fat is more efficient form of fuel storage
B) Glycogen is more efficient form of fuel storage
C) None is a form of fuel storage
D) Both are not fuels for the body

51. Glucose-6-phosphatase is
A) Present in liver but not in muscle
B) Present in liver and muscle both
C) Absent in liver and muscle
D) Present in muscle only

52. Hexokinase has
A) Low affinity for glucose
B) High affinity for glucose
C) High affinity for glucose and galactose
D) High affinity for galactose

53. Approximately what proportion of the human genome is made up of repetitive DNA sequences?
A) 1%
B) 15%
C) 50%
D) 90%

54. Which of the following is true of histones?
A) Histones are acidic proteins
B) Histones are found in animal chromatin but in not plant cells
C) The amino acid sequences of histone proteins are very similar in different organisms
D) All histones form part of the nucleosome core particles in chromatin

55. Which of the following statements is correct, according to Chargaff's rules?
A) All DNA molecules contain the same proportions of A, C, G and T
B) Single-stranded RNA molecules contain the same amount of A and U
C) In double-stranded DNA, the amount of T equals the amount of C
D) In double-stranded DNA, the amount of G equals the amount of C

56. Which of the following is NOT a pyrimidine?
A) Adenine B) Thymine C) Uracil D) Cytosine

57. Which of the following does NOT contain phosphate?
A) A nucleoside B) A nucleotide C) DNA D) RNA

58. Which of the following reactions is required for proofreading during DNA replication by DNA polymerase III?
A) 3' - 5' exonuclease activity B) 5' - 3' exonuclease activity
C) 3' - 5' endonuclease activity D) 5' - 3' endonuclease activity

59. In which of the following would you find telomeres?
A) Human mitochondrial DNA B) Human chromosomes
C) Bacterial chromosomes D) The influenza virus genome

60. Which of the following is true of RNA synthesis (transcription)?
A) RNA synthesis is always in the 5' - 3' direction
B) RNA polymerase needs a primer to initiate transcription
C) In transcription, U is inserted opposite T
D) New nucleotides are added on to the 2' OH of the ribose sugar

61. In bacterial promoters, which of the following describes the 'Pribnow box'?
A) The 5' untranslated region B) The -10 box
C) The -35 box D) The termination sequence

62. Which of the following does the abbreviation TBP stand for?
A) TATA-box binding protein B) Transcription associated factor
C) Transcription factor binding protein D) TATA box polymerase

63. How many different transfer RNA molecules are present in a cell (not including those present in the mitochondria?
A) 64 B) 61
C) 20 D) More than 20, less than 61

64. Which of the following proteins involved in peptide chain elongation is a GTPase switch?
A) Only EF-Tu B) Only EF-G
C) Both EF-Tu and EF-G D) Initiation factor 2

65. The major differences between the prokaryotic and eukaryotic protein synthesis mechanisms are in which part of the process?

A) The initiation of synthesis
B) The chain elongation process
C) The chain termination process
D) None - there are no major differences

66. Proteins directed to which of the following organelles are synthesized by ribosomes attached to the rough endoplasmic reticulum?

A) Nucleus B) Mitochondria C) Lysosomes D) Peroxisomes

67. What is the energy source for transport of molecules into and out of the nucleus?

A) ATP hydrolysis within the cytoplasm
B) GTP hydrolysis within the cytoplasm
C) ATP hydrolysis within the nucleus
D) GTP hydrolysis within the nucleus

68. Which of the following signal molecules binds to a receptor situated in the cytoplasm, not the outer membrane of the cell?

A) Progesterone
B) Adrenaline (Epinephrine)
C) Epidermal growth factor
D) Interferon.

69. Which second messenger signals the release of Ca++ from the endoplasmic reticulum?

A) Cyclic AMP
B) Cyclic GMP
C) 1,2 diacyl glycerol
D) Inositol triphosphate

70. Which of the following is NOT required for a PCR reaction?

A) A thermostable DNA polymerase
B) Dideoxy-dNTPs (ddNTPs)
C) Template DNA
D) Primers

71. Where in the cell is cytochrome P450 located?

A) Mitochodrial inner membrane
B) Cytoplasm
C) Mitochondrial matrix
D) Endoplasmic reticulum

72. Cancer cells often have reduced amounts of cell surface proteins, including class I MHC antigens. Which of the following cells of the immune system can exploit this property to kill cancer cells?

A) Cytotoxic T-cells
B) Natural killer cells
C) Helper T-cells
D) Macrophages

73. In order to enter the cell cycle a cell must be stimulated from outside. What type of molecule provides this stimulation?

A) Cyclins
B) Cyclin dependant kinases
C) Cytokine growth factors
D) Tyrosine kinases

74. In which phase of the cell cycle is DNA replicated?

A) G1 phase B) S phase C) G2 phase D) M phase

75. At which cell cycle checkpoint is the cell cycle halted if the cell's DNA is damaged?

A) G1 – S B) S - G2 C) G2 – M D) G0 - G1

MSc(2Yr)(NuclearMedicine)

1. t-loop is found on which part of chromosome
A) Telomere B) Centromere C) Tetraplex D) Acromere

2. When all the forces and torques are balanced in a mechanical body, it is said to be in
A) Static B) Buoyancy C) Motion D) Equilibrium

3. Colour of commercial nitric acid is because of
A) Nitrogen dioxide B) Oxygen C) Nitric oxide D) Coloured impurities

4. Which of the following phase is involved in the conversion of Chromatin to chromosome?
A) G1-phase B) M-phase C) G2-phase D) S-phase

5. Which of the following is a vector quantity
A) Power B) Electric current C) Area D) Energy

6. Which of the following gases is used for ripening of fruits artificially?
A) Ethane B) Methane C) Ethylene D) Acetylene

7. The largest cell of the body is
A) Nerve cell B) Sperm C) Hair D) Ovum

8. Which of the following is unit of replication?
A) DNA B) Replicon C) Gene D) Chromosome

9. Which of the following radioactive element is used in heat pace makers
A) Uranium B) Radium C) Plutonium D) Deuterium

10. Which part of the body does not have capability of self-repair
A) Bone B) Skin C) Teeth D) Nails

11. Young's modulus is the property of which state
A) Solid B) Liquid C) Gaseous D) Both solid and liquid

12. Which system is used for deciding the period of materials of pre-historic time
A) Deuterium dating B) Uranium dating C) Radium dating D) Carbon dating

13. Which form of colloidal system is present in milk?
A) Fat is dissolved B) Fat and water are dispersed in each other
C) Water is dispersed in Fat D) Fat is dispersed in water

14. A man presses more weight on earth in which of the following positions?
A) Sitting Position B) Lying Position
C) Standing Posting D) Every position has same effect

15. When artificial satellite revolves round the earth in circular orbit which of the following quantity remains constant

A) Linear Velocity B) Angular Momentum
C) Linear Momentum D) Angular Displacement

16. Which type of image is formed by plane mirror?

A) Real and Erect B) Real and Inverted
C) Virtual and Erect D) Virtual and Inverted

17. Monoclonal antibodies recognize a single

A) Epitope B) B cell C) Virus D) Antigen

18. For which of the following electrical conductivity increases with the increase of temperature of a substance

A) Semiconductor B) Conductor C) Carborator D) Insulator

19. Which of the following has highest specific heat?

A) Alcohol B) Kerosene C) Methane D) Water

20. Electronegativity measures which of the following character

A) Metallic B) Non metallic C) Acidic D) Basic

21. What happened to the boiling point when pressure is increased?

A) Increase B) Remains same C) Decrease D) Become zero

22. Product of force and velocity is called

A) Power B) Work C) Momentum D) Energy

23. Which kind of reflection makes an object invisible?

A) Irregular B) Regular C) Normal D) Diffused

24. The ^{1}H- NMR spectrum of $CH_3OCHClCH_2Cl$ will exhibit

A) A 3 proton single, 1 proton singlet and 2 proton doublet
B) A 3 proton singlet, 1 proton triplet and 2 proton doublet
C) A 3 proton doublet, 1 proton singlet and 2 proton doublet
D) A 3 proton triplet, 1 proton triplet and 2 proton triplet

25. An object is placed 1.5 m from a plane mirror. How far is the image from the person?

A) 1 meter B) 1.5 meter C) 2 meter D) 3 meter

26. The intensity of absorption band is always proportional to which of the following factor

A) Temperature B) Atomic population
C) Molecular population of the initial state D) Molecular population of the final state

27. Force constant is not expressed in which of the following units

A) Nm^{-1} B) kp C) Dynes cm^{-1} D) Dyne A^{-1}

28. Self and non-self-recognition ability of immune system is an example of
A) Antigenic immunity B) Tolerance
C) Humoral immunity D) Specific immunity

29. Dentist used which mirror to focus light on the tooth of a patient
A) Convex B) Concave C) Plane D) Cylindrical

30. Cell mediated and humoral immunity is carried out by respectively
A) Epitopes/antigens B) Antibodies/antigens
C) Bcells/Tcells D) Epitopes/antigens

31. Which bacteria can grow in acidic ph
A) Salmonella B) Shigella C) Vibrio cholera D) Lactobacilli

32. Which type of medium is Mac-Conkey
A) Differential B) Transport
C) Enrichment D) Both transport and enrichment

33. Hydroxyl apatite is
A) Major component of Bone and teeth B) Bone
C) Found in bony disease D) Decayed tooth

34. Curie, symbolized by Ci
A) SI system unit for quantity of radioactivity
B) unit for quantity of radioactivity other than SI system
C) 10 g ^{226}Ra
D) 1mg ^{226}Ra

35. Which of following commonly acts as the precursor for the synthesis of vitamin C (Ascorbic acid) in plants
A) Fructose B) Ribose C) Glucose D) Ribulose

36. PET refers to
A) Positive electron transfer B) Positron emission tomography
C) Positive electron tomography D) Positive electron tomography

37. In reversed phase HPLC
A) A hydrophilic stationary phase is combined with a non-polar mobile phase
B) A hydrophilic stationary phase is combined with a polar mobile phase
C) A hydrophobic stationary phase is combined with a polar mobile phase
D) A hydrophobic stationary phase is combined with a non-polar mobile phase

38. Number of protons in one μA of proton beam are
A) $6.25*10^{6}$ B) $6.25*10^{19}$ C) $6.25*10^{12}$ D) None of these

39. Meisner Effect, a phenomenon of Superconductor represents?
A) Zero resistance for flow of electricity
B) When placed in magnetic field magnetic field lines flow around it
C) When placed in magnetic field allows magnetic Lines flow through it
D) Resist flow of electricity through it

40. Which of amino acid act as the precursor of serotonin and dopamine respectively
A) Tryptophan and Tyrosine
B) Aspartate and tryptophan
C) Tyrosine and arginine
D) Phenylalanine and tryptophan

41. The mass of Neutron?
A) 1.00727 amu B) 1.00560 amu C) 1.00866 amu D) 1.0068 amu

42. Name the process by which a malignant cell spread through normal cells
A) Transformation B) Metastasis C) Invasiveness D) Progression

43. Which statement is TRUE regarding quantum mottle:
A) Less with use of filters
B) Larger the number of photons absorbed, more is the noise
C) Less with high KV energies
D) Random pattern of photons on x-ray film

44. Name the regulatory component of the cell cycle
A) Cyclin B) CDK C) DNA D) APC

45. Which statement is FALSE for photoelectric effect:
A) Photon disappears completely
B) Decrease with increase in density
C) Produces ionized atom
D) Interaction between photon and bound electron

46. How many hours dose the M phase take to complete a cycle
A) 8h B) 1h C) 4h D) 11h

47. The focus of a concave mirror is
A) At the pole B) Virtual C) Real D) Unidentified

48. The statement is NOT correct for Compton scatter:
A) Energy of photon is reduced gradually
B) The energy of scattered photon depends on the energy of incident photon
C) 90 degree scatter photon has a higher energy than a 60 degree scatter photon
D) Direction of scattered photon depends on energy of incident photon

49. The Medical Cyclotron is used for producing radionuclides used in health science. The RF power source generally employed is:
A) Klystron B) Tetrode C) Magnetron D) Megnetron and Klystron

50. The particle frequency in cyclotron is independent on
A) The velocity and circular path of the particle
B) Mass of the particle
C) Strength of the magnetic field
D) Specific charge of the particle

51. If the energy of proton is 80 KeV. What will be the velocity? (Mass of proton is $1.7*10^{-27}$kg)
A) $6.3*10^{5}$ ms^{-1} B) $3.9*10^{6}$ ms^{-1} C) $3.6*10^{6}$ ms^{-1} D) $9.7*10^{8}$ ms^{-1}

52. If a positively charged particle is moving towards east enters a region of uniform magnetic field directed vertically upwards. The particle will
A) Move in a circular orbit with its speed increased
B) Continue to move due east
C) Gets deflected vertically upwards
D) Move in a circular orbit with its speed unchanged

53. The flux density at 1 m from a neutron emitting source that emits 10^{7} neutrons/sec is:
A) 10^{7} $n.cm^{-2}.s^{-1}$ B) 10^{7} $n.s^{-1}$ C) 10^{5} $n.s^{-1}$ D) 10^{5} $n.cm^{-2}.s^{-1}$

54. The annual equivalent dose limit for lens of the eye for occupational worker is:
A) 150 mSv/year B) 20 mSv per year C) 50 mSv per year D) None of these

55. What is the site of spermatogenesis
A) Seminiferous tubules B) Epididymis C) Vasa deference D) Rete testis

56. Which of the amino acid act as Excitatory neurotransmitter
A) Glycine B) Alanine C) GABA D) Glutamate

57. Which of the following amino acid is having more polarity
A) Lysine B) Arginine C) Histidine D) Aspartate

58. Which DNA polymerase enzyme involve in base excision repair mechanism
A) Pol-alpha B) Pol-beta C) Pol-gama D) Pol-delta

59. The frequency of oscillation of a particle having charge q, mass m and kinetic energy E, enters a magnetic field B normally, will be :
A) $mB/2\pi q$ B) $qB/2\pi m$ C) $qE/2\pi B$ D) $qE/2\pi m$

60. In nucleotide excision repair mechanism, which of following protein processes the helicase activity
A) Uvr-A B) Uvr-B C) Uvr-C D) Uvr-D

61. The force experienced by a charge of 1 C moving perpendicular in a magnetic field of 0.5 T with a velocity 10m/s is:
A) 5 N B) 0.5 N C) 1 N D) 50 N

62. The Kinetic energy of a proton accelerated through 1000 V will be:
A) 1840 eV B) 1 KeV C) 13.60 KeV D) 0.54 KeV

63. $LD_{50/60}$ stand for
A) Lethal Dose that produce 50 percent lethal effect in a population in 60 years
B) Lethal Dose that produce 50 percent lethal effect in a population in 60 hours
C) Lethal Dose that produce 50 percent lethal effect in a population in 60 days
D) Lethal Dose that produce 50 percent lethal effect in a population in 60 months

64. Which of the following is not polymorphonuclear leukocytes
A) Eosinophils B) Mast cell C) Macrophages D) Basophils

65. The sparsely ionizing radiation are
A) x and gamma B) Beta and gamma
C) Protons and Alpha D) Alpha and beta

66. UNSCEAR stands for
A) United nations scientific committee on effects of atomic radiation
B) United nations scientific commission on effects of atomic radiation
C) United nations scientific co-operations on effects of atomic radiation
D) United nations scientific contribution on effects of atomic radiation

67. Some organs exhibit a threshold response to radiation effects, which is called a(n)
A) Acute effect B) Stochastic effect
C) Non stochastic effect D) Genetic effect

68. How many stereoisomers will keto pentose have:
A) 4 B) 6 C) 8 D) 10

69. What are lectins?
A) Sugars specific to proteins B) Proteins specific to sugars
C) Enzymes specifics to carbohydrates D) Carbons specific to carbohydrate

70. A 50 mCi P-32 vial was received but was not used. According to dispatch date, the vial is 35 days old but is properly packed. What will be the activity of P-32 in that vial after 35 days (half-life 14.3 days):
A) 11.16 mCi B) 8.16 mCi C) 9.16 mCi D) 10.16 mCi

71. Resting phase of the cell where it undergoes growth and DNA replication is called
A) Mitosis phase B) G1 phase C) Interphase D) M phase

72. The personal monitoring is used to
A) indicate a radiation worker's occupational exposure
B) protect the radiation worker
C) calculate the total amount of radiation a radiation worker delivers

D) monitor a radiation worker's repeat rate

73. The approximate exposure rate at one meter from 50 mCi I-131 source provided there is 1cm thick lead shield between source and measuring point

A) 1.1 mR/hr B) 11 mR/hr C) 11 R/hr D) 1.1 R/hr

74. Barn is the unit of

A) Interaction crossection B) Interaction co-efficient

C) Interaction correlation D) None of these

75. Which one is the most efficient shielding material for neutrons less than 25 MeV

A) Polyethylene B) Concrete C) Heavy concrete D) Earth

x-x-x

MSc(2Yr)(Forensic Science & Criminology)

Note: (i) Question No. 1 to 20 (General Science) compulsory for all.
(ii) Students has to attempt any two portions out of Physics (Question Nos. 21-45), Chemistry (Q. No. 46-70) Biology (Q. No. 71-95) and Forensic Science (Q. No. 96-120).

1. Benedict solution is used for the test of
A) Reducing agents B) Oxidizing sugers
C) Reducing sugers D) Oxidizing agents

2. The central metal of chelate compound 'Chlorophyll' is
A) Mg B) Cu C) Fe D) Mn

3. Phenomenon explaining spreading of ink in water is
A) Dipole movement B) Diffusion
C) Solute kinetics D) Osmosis

4. Ascorbic acid is
A) Vitamin A B) Vitamin D C) Vitamin C D) Vitamin E

5. Malaria control suggests spraying oil on stagnant water. Why?
A) Mosquito larva cannot breath
B) Malaria parasites are killed by oil layer
C) Surface tension of water changes
D) Mosquito eggs are rumpled

6. Fuel efficiency is expressed as
A) Calorimetric value B) Octane value
C) Calorific value D) Fuel specific value

7. What is the major contributing component of acid rain?
A) Oxides of Sulphur and Nitrogen
B) Hydroxides of Phosphorus and Magnesium
C) Oxides of Calcium and Magnesium
D) Hydroxide of Phosphorus and Nitrogen

8. Which radioactive element is generally present in humans?
A) Cobalt-60 B) Iodine-131 C) Patassium-40 D) Beryllium-3

9. Sebum is related to
A) Pituitary B) Skin C) Liver D) GIT

10. The instrument to detect and measure earthquakes is called
A) Seismograph B) Richter scale C) Technograph D) Bolometer

11. Simultaneous cycles of heating and pressure turn existing rocks into
A) Igneous B) Metamorphic C) Sedimentary D) Phreatomagmatic

12. Which of the following is the effective extinguisher for all confined fires?
A) CO_2 B) NO_2 C) SO_2 D) N_2O

13. The type of combustion where a material suddenly bursts into flames, without application of any apparent cause is called
A) Rapid combustion B) Explosion
C) Automated combustion D) Spontaneous combustion

14. In agriculture the process of loosening and turning of soil is called
A) Drilling B) Cultivating C) Tilling D) Shearing

15. Which process portrays the excretion in Amoeba?
A) Diffusion B) Infusion C) Uricotelic D) Transport

16. Which of the following metals forms amalgam with other metals?
A) Aluminium B) Copper C) Mercury D) Chromium

17. Sodium metal being very reactive, is preserved in
A) Alcohol B) Kerosene C) Water D) Acetone

18. Disease carrying agents are called
A) Pathogens B) Vectors C) Microorganisms D) Microbes

19. Epoxy resins are very effective
A) Insecticides B) Cement precursor C) Adhesives D) Deliriant

20. Chemically 'soaps' are
A) Glycerol and fatty acids B) Sodium/Potassium salts of fatty acids
C) Esters of fatty acids D) Glycerine and fatty acids

21. If, ultrasonic, infrasonic and audible waves travel through a medium with speeds ν_u, ν_i, ν_a respectively, then
A) ν_u, ν_i, ν_a are nearly equal B) $\nu_u \geq \nu_a \geq \nu_i$
C) $\nu_u \leq \nu_a \leq \nu_i$ D) $\nu_a \leq \nu_u$ and $\nu_u \leq \nu_i$

22. The equation of displacement of two waves are given as $y_1 = 10 \sin\left(3\pi t + \frac{\pi}{3}\right)$ and $y_2 = 5$ (sin 3 π t + $\sqrt{3}$ cos 3πt) then, what is the ratio of their amplitudes
A) 1:2 B) 2:1 C) 1:1 D) None

23. A simple harmonic motion having an amplitude A and time period T is represented by the equation y = 5 sin π (t + 4) m then the values of (A in m) and (T in sec) are
A) A = 5, T = 2 B) A = 10, T = 1 C) A = 5, T = 1 D) A = 10, T = 2

24. The impedance of a series RLC circuit is 8 ohm, when ν = 60Hz at resonance and 10 ohm at 80 Hz. Calculate the value of L & C.
A) 2.7H, 2.6F B) 0.0261H, 0.00027F
C) 26H, 2.7F D) 0.00261H, 0.0027F

25. On the surface of the lake floats two pieces of wood, the distance between them is 6 m. The waves propagate on the surface of the lake. When the first wood has moved up and down three times, the second wood just moved up and down one time. If every 2 seconds both kinds of wood move up and down three times, the wave propagation is

A) 2.0 m/s B) 3.0 m/s C) 1.5 m/s D) 4.5 m/s

26. On a rope propagates a wavelength rope with a frequency of 50 Hz and a wavelength of 2 m. Period and velocity of the wave are

A) 0.02 seconds and 50 ms^{-1} B) 0.02 seconds and 100 ms^{-1}

C) 0.04 seconds and 50 ms^{-1} D) 0.5 seconds and 100 ms^{-1}

27. What will happen to a glass rod immersed in a liquid of the same refractive index? It will

A) Appear bent B) Look longer C) Disappear D) Appear short

28. The ratio of path length and the respective time interval is

A) Mean velocity B) Mean speed

C) Instantaneous velocity D) Instantaneous speed

29. The idea of Quantum nature of light has emerged in an attempt to explain

A) Interference B) Diffraction

C) Polarization D) Radiation spectrum of black body

30. A spaceship is receding from earth at a speed of 0.21 *c*. A light from the spaceship appears as yellow (λ = 589.3 nm) to an observer on earth. What would be its color as seen by the passenger of the spaceship?

A) Green B) Blue C) White D) Grey

31. The oscillator has

A) Positive feedback B) Negative feedback

C) No feedback D) Both type of feedback

32. In nuclear fusion 0.1% mass is converted into energy. The energy released by the fusion of 1 kg mass will be

A) $9x10^{16}$ J B) $9x10^{19}$ J C) $9x10^{13}$ J D) $9x10^{17}$ J

33. T*he branch* of classical mechanics dealing with motion without considering its cause is known as

A) Kinematics B) Dynamics C) Hydrodynamics D) Mechanics

34. If a positive point charge is placed outside a neutral conducting sphere, what will be the charge on the sphere?

A) Negative and distributed uniformly over the surface of the sphere

B) Negative and appears only at the point on the sphere closest to the point charge

C) Negative and distributed non-uniformly over the entire surface of the sphere

D) Zero

35. A converging lens is used to form an image on a screen. When the upper half of the lens is covered by an opaque screen:

A) Half of the image will disappear B) Image will not form on the screen.
C) Intensity of image will increase D) Intensity of image will decrease

36. The Helmholtz free energy function is defined as

A) $F = U + TS$ B) $F = U - TS$ C) $F = U + PV$ D) $F = U + PV - TS$

37. The neutral temperature of Cu-Fe thermocouple is 270°C. If the temperature of cold junction is 30°C, the temperature of inversion will be

A) 510 K B) 510°C C) 300 K D)300°C

38. If kinetic energy of free electron is made double, change in De-Broglie wavelength will be

A) $\sqrt{2}$ B) $\frac{1}{\sqrt{2}}$ C) 2 D) $\frac{1}{2}$

39. In circular coil when number of turns is doubled and resistance becomes half of the initial then inductance becomes

A) 4 times B) 2 times C) 8 times D) No change

40. A block of mass *m* is placed on a smooth inclined plane of inclination θ. What will be the magnitude of the force exerted on the block by the plane?

A) mg B) $mg/\cos\theta$ C) $mg\tan\theta$ D) $mg\cos\theta$

41. In Fraunhofer diffraction, the incident wave front is

A) Plane B) Spherical C) Cylindrical D) Circular

42. The band gap energy of CuO is

A) 0 eV B) 0.7 eV C) 0.08 eV D) 2.1 eV

43. The electronic contribution to the specific heat of a metal at low temperature is proportional to

A) T B) T^2 C) T^3 D) T^4

44. Technetium-99 ($^{99}Tc_{43}$) has an excited state that decays by emission of a gamma ray. The half-life of the excited state is 360 min. What is the activity, in curies, of 1.00 mg of this excited isotope?

A) 1.95 x 10^{14}Bq B) 3.95 x 10^{-14}Bq C) 3.95 x 10^{14}Bq D) 1.95 x 10^{-14}Bq

45. Knee voltage of Si (silicon) diode is

A) 0.3V B) 1.1V C) 0.7V D) 1.43V

46. Which of the following orbital is not possible?

A) 1s B) 2s C) 2p D) 3f

47. How many orbitals are there in f and g subshell?

A) 6, 8 B) 7, 9 C) 7, 11 D) 9, 11

48. Which of the following is not a hard base?

A) NH_3 B) H_2O C) Cl^- D) CN^-

49. The correct order of acidic character of hydro acid of group VII is

A) HI>HBr>HCl>HF B) HI>HBr>HF>HCl

C) HF>HBr>HCl>HI D) HI>HF>HBr>HCl

50. What is % ionic character of C-Cl bond in CCl_4 if the electro negativities of C and Cl are 3.5 and 3.0 respectively?

A) 8.875% B) 7.675% C) 7.689% D) 8.867%

51. Lattice energy of a solid increases if

A) The ion are large B) The ion are small

C) The ions are of equal size D) Charge on the ions are small

52. Which of the following molecules is not tetrahedral?

A) CF_4 B) SF_4 C) CH_4 D) SiF_4

53. The bond order in superoxide (O_2^-) ion is

A) 2 B) 2.5 C) 1.5 D) 3

54. During oxidation process electrons are:

A) Gained B) Paired up C) At same state D) Lost

55. The process of heating the concentrated ore in a limited supply of air or in the absence of air is known as:

A) Roasting B) Leaching C) Calcination D) Cupellation

56. Which one of the following Vitamins is essential for coagulation of Blood?

A) K B) C C) A D) B1

57. Which transitions are studied by UV spectrometer?

A) Rotational B) Electronic C) Nuclear D) Vibrational

58. Average kinetic energy per molecule of gases is

A) (3/2)kT B) (3/2)RT C) (1/2)kT D) (1/2)RT

59. For one mole of gas Cp and Cv relations are:

A) Cv = CP+R B) Cp = Cv–R C) Cp = Cv+R D) Cv = Cv-R

60. The cell in which chemical energy is converted to electrical energy is:

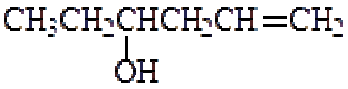
A) Galvanic cell B) Voltaic cell

C) Electrolytic cell D) Electrochemical cell

61. Sea water can be converted into fresh water by:

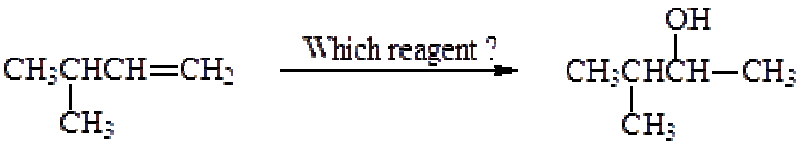
A) Osmosis B) Sedimentation C) Diffusion D) Reverse Osmosis

62. The correct IUPAC name for the following structure is.



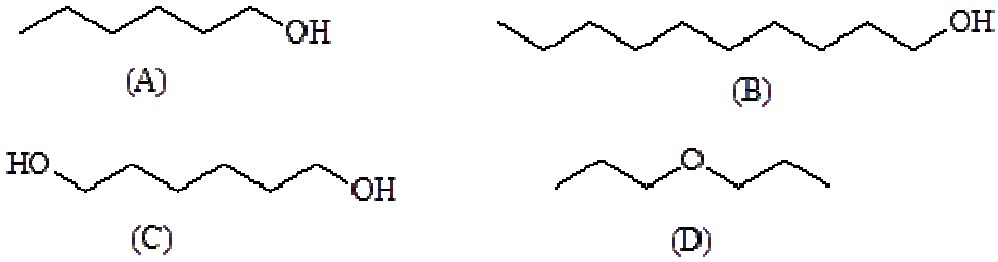
A) 5-hexen-3-ol
B) 1-hexen-4-ol
C) 3-hydroxy-5-hexene
D) Isohexen-3-ol

63. Which is the best reaction sequence to use if one wants to accomplish an alcohol synthesis shown below?

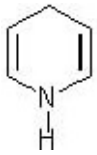


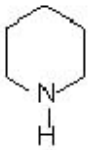
A) $NaOH/H_2O$
B) $KMnO_4/H_2O$
C) i) $Hg(OAc)_2/H_2O$ ii) $NaBH_4$
D) i) BH_3 ii) H_2O_2/HO^-

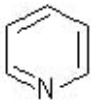
64. Which of the following compounds is expected to have the greatest solubility in water?

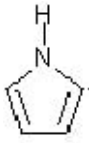


65. Which of the following amines is pyridine?

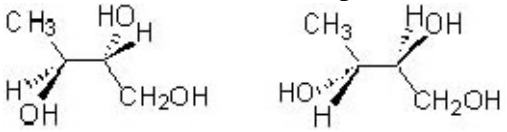
A) 

B) 

C) 

D) 

66. Determine the relationship between the two molecules shown below



A) Constitutional isomers B) Enantiomers
C) Diastereomers D) Identical molecules

67. A strong signal at 1700 cm^{-1} in an IR spectrum indicates the presence of
A) Alcohol B) Ether C) Carbonyl D) Amine

68. Which of the following cycloalkanes has the MOST strain energy?
A) Cyclobutane B) Cyclopentane C) Cyclohexane D) Cycloheptane

69. Which of the following does NOT increase the reaction rate by affecting the number or nature of collisions?
A) Increasing the pressure B) Increasing the surface area
C) Increasing the temperature D) Catalyst

70. Among F^-, Na^+,O^{2-} and Mg^{2+} ions, those having the highest and the lowest ionic radii respectively are;
A) $O^{2-}$and Na^+ B) F^- and Mg^{2+} C) $O^{2-}$and Mg^{2+} D) $Mg^{2+}$and O^{2-}

71. A plant cell that is placed in an isotonic solution will
A) Gain more water B) Lose water
C) Remain as such D) Inflate

72. In which of the following processes the CO_2 is liberated?
A) Ascent of sap B) Photosynthesis C) Respiration D) Transpiration

73. Which of the sequence of atoms can be found in the backbones of polypeptides?
A) C-N-N-C B) C-C-C-N C) C-C-N-C D) N-C-C-C

74. Sleeping movements of leguminous plants are called
A) Nastic B) Tropical C) Twining D) Winding

75. Doctrine of evolution is concerned with
A) Special creation theory B) Abiogenesis
C) Gradual changes D) Biogenesis

76. A thick walled spore meant for perennation is called as
A) Aplano spore B) Hypnospores
C) Hypospores D) Akinete

77. Which of the following is the best indicator of SO_2 pollution
A) Pinus B) Lichans C) Ferm D) Algae

78. The sensory receptors for 'pain'are called as

A) **Mechanoreceptors** **B)** Pacinian recpetors
C) Perifollicular cells D) **Nociceptors**

79. The successive nucleotides of DNA are covalently linked through:

A) Phosphodiester bond B) Glycosidic bond
C) Hydrogen bond D) Ioinic bond

80. In the cell cycle, mitosis occurs between which two phases?

A) G1 and S phase B) S and G1 phase
C) S and G2 phase D) G1 and G2 phase

81. In two dimensional electrophoresis proteins are separated:

A) Initially by mass and then by charge B) On the basis of charge
C) On the basis of mass D) Initially by charge and then by mass

82. The smallest RNA is

A) Transfer RNA B) Messenger RNA
C) Ribosomal RNA D) Chromosomal RNA

83. Osmosis is a form of diffusion in which:

A) Solute moves freely from a region of higher concentration to lower concentration through semi-permeable membrane
B) Solvent moves through a semi-permeable membrane from a region, where a solute is in higher concentration to region of lower concentration
C) Solvent moves through a semi-permeable membrane from a region, where a solute is in lower concentration to region of higher concentration
D) Solute moves freely down the concentration gradient

84. In ovary the prosgestrone and estrogen are secreted by

A) Corpus callosum and Granulosa cells
B) Corpus delicti and Graafian follicles
C) Corpus albicans and Graafian follicles
D) Corpus luteum and Granulosa cells

85. Hepatic portal system takes blood from

A) Gastrointestinal tract to liver B) Kidney to liver
C) Heart to liver through kidney D) Brain through heart to liver

86. Bottom dweller animals are known as

A) Arboreal B) Benthos C) Abyssal D) Producers

87. Tight junctions

A) Are essential for metabolic coupling
B) Donot occur in vertebrates
C) Have the closest approach of two plasma membranes of any junction

D) Surround connexons

88. Satellite DNA is:
A) Extra chromosomal DNA
B) Ribosomal RNA genes
C) Single gene region
D) Short repetitive nucleotide sequences

89. The vascular bundle having xylem and phloem at the same radius is termed as
A) Collateral B) Concentric C) Lipocentric D) Anphicribal

90. What is the distance between the two DNA base pairs?
A) 34Å B) 3.4 Å C) 24 Å D) 2.4 Å

91. Which of the following is Sex linked inheritance?
A) Cretinism B) Anaemia C) Color blindness D) Gigantism

92. Which of the following is the connecting link between reptiles and birds?
A) Dimetrodon B) Dodo C) Archaeopteryx D) Sphenodon

93. Fluid mosaic model of cell membrane was given by:
A) Beadle and Tatum B) Singer and Nicholson
C) Watson and Crick D) Robertson and Miller

94. The plants growing in shifting sand are called
A) Lithophytes B) Halophytes C) Chasmophytes D) Psammophytes

95. Empty glumes are called
A) Petals B) Bracts C) Carpels D) Stamens

96. LSD is derived from
A) Alcohol B) Bacteria C) Fungus D) 2,4-DS

97. Coronal suture may begin to fuse by the age of
A) 24 yrs B) 30 yrs C) 38 yrs D) 48 yrs

98. **Rigor mortis first evident in**
A) Intestine B) Myocardium C) Interstitial muscle D) **Eyelids**

99. Universal charcoal essentially contains two parts of
A) Magnesium oxide
B) Activated animal charcoal
C) Tannic acid
D) Magnesium phosphate

100. "Paradox" gun is associated with
A) Revolver B) Automatic pistol C) Shotgun D) Machine gun

101. Which section of IPC defines 'Rape'?

A) **375** **B) 376** **C) 376A** **D) 377**

102. What is source of nuclear DNA from blood?

A) **Plasma** **B) Platelets** **C) Erythrocytes** **D) Leucocytes**

103. Heroin is obtained by treating morphine with

A) Acetic anhydride B) Ethanol C) Ester D) Diethyl ether

104. Which is the least common fingerprint pattern?

A) Loop B) Whorl C) Arch D) Composite

105. Restoration of erase number on metallic surface can be done by

A) **Metallic Brushing** **B) Filing**

C) Soft hammering **D) Chemical itching**

106. Who is the father of Forensic Toxicology?

A) **Mathieu Orfila** **B) Karl Landsteiner**

C) Meille Mathieu **D) Wiener Landsteiner**

107. Which poison can be detected in the bones even long after death?

A) **Mercury** **B) Arsenic** **C) Antimony** **D) Lead**

108. Which is the most common substance of abuse in India?

A) **Cannabis** **B) Opium** **C) Alcohol** **D) Tobacoo**

109. The impression on the road appearing when tyre of vehicle move without revolving is called

A) Tyre mark B) Friction mark C) Contact marks D) Skid marks

110. The fusion of diaphysis and both the epiphysis together is called

A) Epiphyseal closure B) Brow ridge

C) Epicondyl D) Sciatic notch

111. Which is the best site from where diatoms can be obtained in dumped drowning ?

A) Bone marrow of radia B) Liver

C) Lungs D) Bone marrow of femur

112. How much 'ounce' is 'dram equivalent' equal to

A) 1/24 of ounce B) 1/16 of ounce C) 1/32 of ounce D) 1/8 of ounce

113. Which of the following is a regenerated fiber?

A) Nylon B) Orlon C) Acrylic D) Rayon

114. Pearson's formula in anthropology is used to calculate

A) Stature B) Crural index C) Age D) Craniometric index

115. IR spectrum of any molecules is also called as

A) Finger print B) Identification mark

C) Bond marker D) Transmittance mark

116. The fourth component of fire tetrahedron, other than heat, fuel and oxygen is

A) Energy B) Oxidiser C) Substrate D) Chain reaction

117. What does the Section 29C CrPC depicts?

A) Investigating officer Report B) Government scientific experts Report

C) Police officer Report D) Public dealing officer Report

118. What is the major component of single base smokeless powder?

A) Insoluble Nitroglycerine B) Insoluble Nitroglycerine

C) Insoluble Nitrocellulose D) Soluble Nitrocellulose

119. Heat resistant Pyrex glass is an example of

A) Borosilicate glass B) Aluminosilicate glass

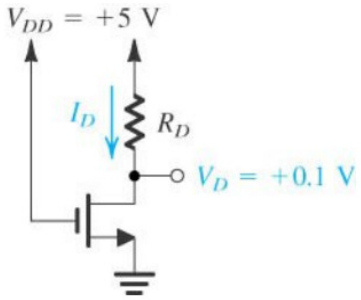
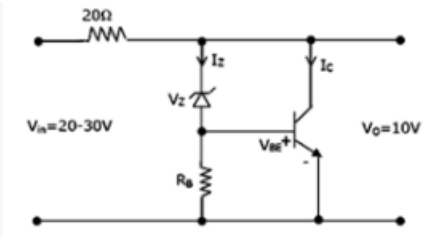
C) Lead-oxide glass D) Fused-silica glass

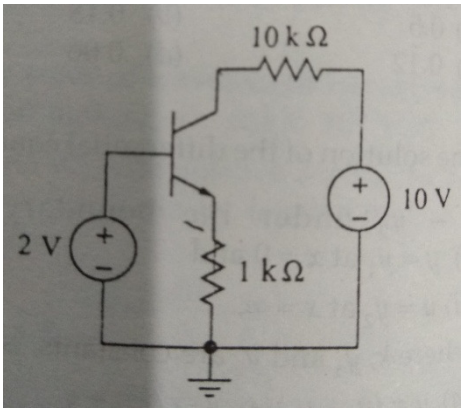
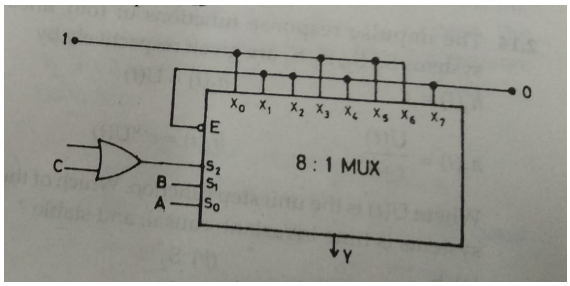
120. Cheiloscopy is the study of

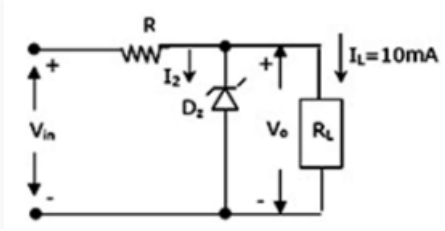
A) Finger prints B) Lip prints C) Foot prints D) Palate prints

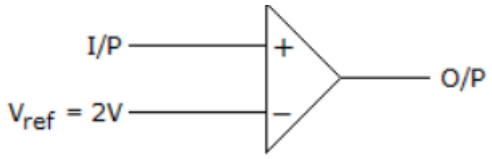
x-x-x

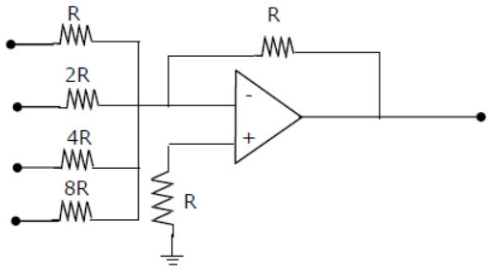
M.E.(Electronics& Communication Engg.)/M.Tech. Microelectronics

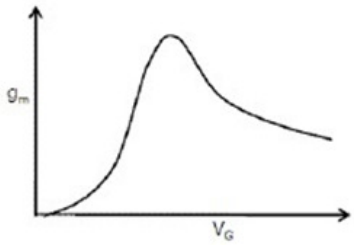
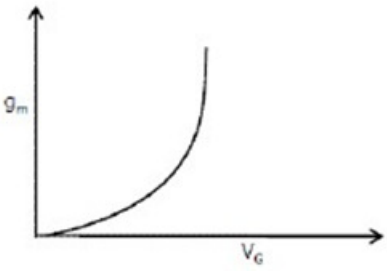
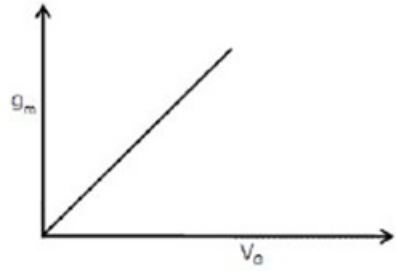
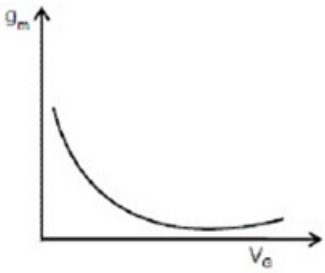
1.	To establish drain voltage of 0.1V. What drain current and effective resistance between drain and source is required? The MOSFET parameters are, Vth=1V, Kn'(W/L)=1mA/V^2.  A. 39.5mA, 1.24kΩ B. 39.5mA, 12.4kΩ C. 0.395mA, 1.24kΩ D. 0.395mA, 12.4kΩ
2.	Under low-level injection assumption, the injected minority carrier current for an extrinsic semiconductor is essentially the A. diffusion current B. drift current C. recombination current D. induced current
3.	The transistor shunt regulator shown in the figure has a regulated output voltage of 10 V, when the input varies from 20 V to 30 V. The relevant parameters for the Zener diode and the transistor are: V_Z = 9.5 V, V_{BE} = 0.3 V, β=99. Neglect the current through R_B. Then the maximum power dissipated in the Zener diode (P_Z) and the transistor (P_T) are:  A. P_Z = 75 mW, P_T = 7.9 W B. P_Z = 85 mW, P_T = 8.9 W C. P_Z = 95 mW, P_T = 9.9 W D. P_Z = 115 mW, P_T = 11.9 W

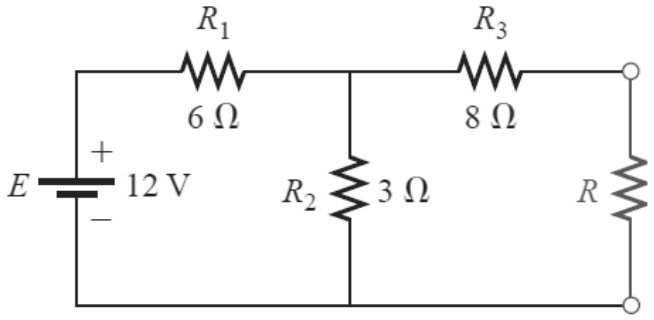
4.	For the BJT circuit shown, assume that the β of the transistor is very large and V_{BE} = 0.7 V. The mode of operation of the BJT is:  A. cut-off B. saturation C. normal active D. reverse active
5.	An ideal sawtooth voltage waveform of frequency 500 Hz and an amplitude of 3V is generated by charging a capacitor of 2μF in every cycle. The charging requires: A. constant voltage source of 3 V for 1 ms B. constant voltage source of 3 V for 2 ms C. constant current source of 3 mA for 1 ms D. constant current source of 3 mA for 2 ms
6.	The zero bias capacitance for an abrupt pn junction is 20pF. Calculate the capacitance when the reverse bias of -7V is applied. A. 5.16uF B. 51.6pF C. 5.16pF D. 51.6uF
7.	In the TTL circuit in the figure, S_2 to S_0 are select lines and I_7 to X_0 are input lines. S_0 and X_0 are LSBs. The output Y is:  A. indeterminate B. $A \oplus B$

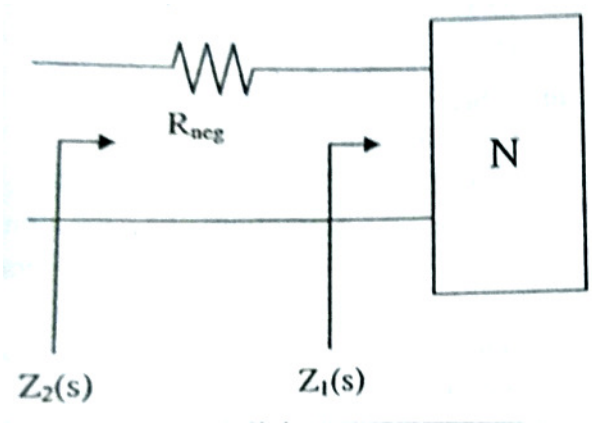
	C. $\overline{A \oplus B}$ D. $\overline{C}(\overline{A \oplus B}) + C(A \oplus B)$
8.	A Zener diode regulator in figure is to be designed to meet the specifications: I_L = 10 mA, V_0 = 10 V and V_{in} varies from 30 V to 50 V. The Zener diode has V_Z = 10 V and I_{ZK} (knee current) = 1 mA. For satisfactory operation  A. R ≤ 1800 Ω B. 2000 Ω≤ R≤ 2200 Ω C. 3700 Ω≤ R≤ 4000 Ω D. R > 4000 Ω
9.	A Silicon PN junction at a temperature of 20^0C has a reverse saturation current of 10 pico-Amperes (pA). The reverse saturation current at 40^0C for the same bias is approximately: A. 30pA B. 40pA C. 50pA D. 60pA
10.	What is the wavelength of light waves in free space, if the frequency is 5×10^{14}? A. 0.6 m B. 6 mm C. 0.06 mm D. 0.6 µm
11.	The electron concentration in a sample of uniformly doped n-type silicon at 300K varies linearly from $10^{17}/cm^3$ at x=0 to 6 x $10^{16}/cm^3$ at x = 2µm. Assume a situation that electrons are supplied to keep this concentration gradient constant with time. If the electronic charge is 1.6 x 10^{-19}coulomb and the diffusion constant is D_n = 35 cm^2/ s, the current density in the silicon, if no electric field is present is: A. Zero B. -1120 A/cm^2 C. +1120 A/cm^2

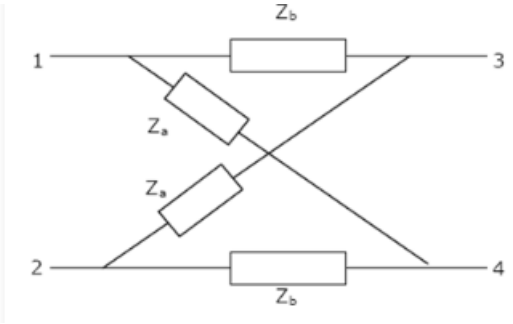
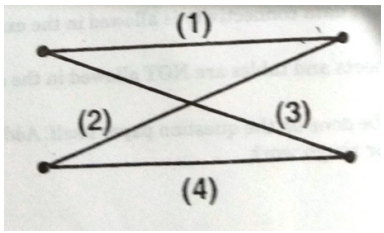
	D. -1020 A/cm^2
12.	If the input to the ideal comparator shown in the figure is a sinusoidal signal of 8V (peak to peak) without any DC component, then the output of the comparator has a duty cycle of:  A. 1/2 B. 1/3 C. 1/6 D. 1/12
13.	Consider the following assembly language program MVI B, 87H MOV A, B START:JMP NEXT MVI B, 00H XRA B OUT PORT 1 HLT NEXT:XRA B JP START OUT PORT 2 HLTB The expression of the above program in an 8085 microprocessor will result in: A. an output of 87H at PORT 1 B. an output of 87H at PORT 2 C. infinite looping of program execution with accumulator data alternating between 00H and 87H D. infinite looping of program execution with accumulator data alternating between 00H and 87H

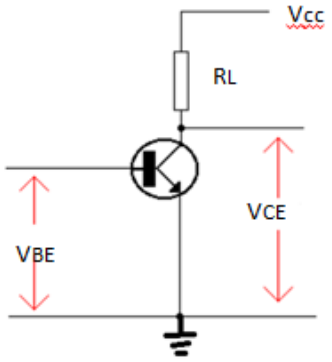
14.	The circuit shown in the figure is a 4-bit DAC: The input bits 0 and 1 are represented by 0 and 5V respectively. The OP AMP is ideal, but all the resistances and the 5V inputs have a tolerance of ±10%. The specification (rounded to the nearest multiple of 5%) for the tolerance of the DAC is:  A. ±35% B. ±20% C. ±10% D. ±5%
15.	Often a common-collector will be the last stage before the load; the main function(s) of this stage is to: A. provide voltage gain B. provide phase inversion C. provide a high-frequency path to improve the frequency response D. buffer the voltage amplifiers from the low-resistance load and provide impedance matching for maximum power transfer
16.	At 300 K, for a diode current of 1 mA, a certain germanium diode requires a forward bias of 0.1435V, whereas a certain silicon diode requires a forward bias of 0.178V. Under the conditions stated above, the closest approximation of the ratio of reverse saturation current in germanium diode to that in silicon diode is: A. 1 B. 5 C. 4×10^3 D. 8×10^3
17.	For good differentiation one must ensure the time period T of signal is related to time constant RC as: A. T=RC B. T<RC

	C. T= RC/2 D. T>RC
18.	The measured transconductance g_m of an NMOS transistor operating in the linear region is plotted against the gate voltage V_G at a constant drain voltage V_D. Which of the following figures represents the expected dependence of g_m on V_G?
	 A.  B.
	 C.  D.
19.	A Zener diode is based on the principle of: A. Thermionic emission B. Tunneling of charge carriers across the junction C. Diffusion of charge carriers across the junction D. None of the above.
20.	A rectangular waveguide has dimension cm 5.0 cm ×0.1cm , its cutoff frequency for the dominant mode is A. 5 GHz B. 15 GHz C. 10 GHz D. 20 GHz
21.	The capacitance per unit length and the characteristic impedance of a lossless transmission line are C and Z_o respectively. The velocity of a travelling wave on the transmission line is A. Z_oC B. $1/(Z_oC)$ C. Z_o/C

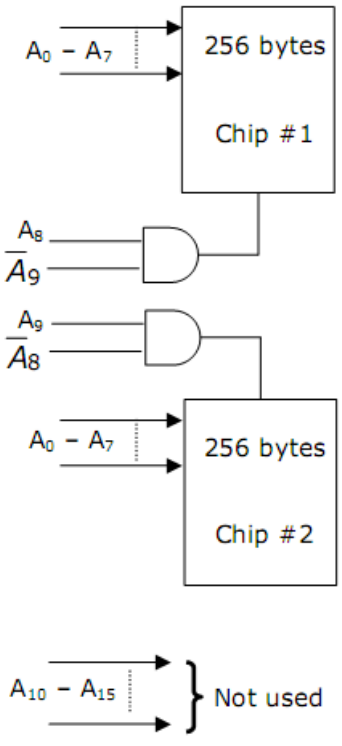
	D. C/Z_o
22.	A transmission line of characteristic impedance 50W is terminated in a load impedance Z_L. The VSWR of the line is measured as 5 and the first of the voltage maxima in the line is observed at a distance of $\lambda/4$ from the load. The value of Z_L is: A. 10Ω B. 250 Ω C. (19.23+ j46.15) Ω D. (19.23 - j46.15) Ω
23.	White Gaussian noise is passed through a linear narrow band filter. The probability density function of the envelope of the noise at the filter output is A. Rayleigh B. Gaussian C. Poisson D. Uniform
24.	The steady-state error of a feedback control system with an acceleration input becomes finite in a A. type 0 system B. type 1 system C. type 2 system D. type 3 system
25.	Consider a DC voltage source connected to a series R-C circuit. When the steady-state reaches, the ratio of energy stored in the capacitor to the total energy supplied by the voltage source, is equal to: A. 0.362 B. 0.500 C. 0.632 D. 1.000
26.	For the network of Fig. shown below, the maximum value of power delivered to *R* is  A. 0.8 W

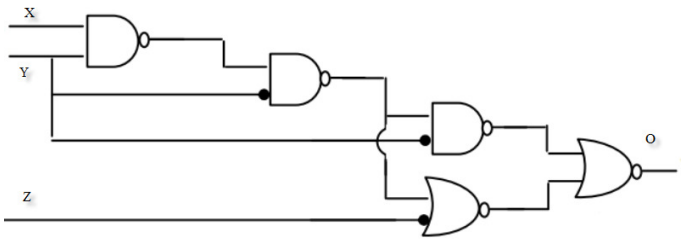
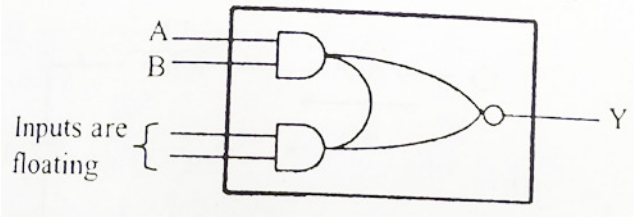
	B. 1.2 W C. 0.4 W D. 1.6 W
27.	From measurement of the rise time of the o/p pulse of an amplifier whose input is a small amplitude square wave, one can estimate the following parameter of the amplifier. A. Gain-bandwidth product B. Slew-Rate C. Upper-3-dB frequency D. Lower-3-dB frequency
28.	A negative resistance having R_{neg} is connected to a passive network N having driving point impedance $Z_1(s)$ as shown below. For $Z_2(s)$ to be positive real,  A. $\lvert R_{neg}\rvert \leq Re\ Z_1(j\omega), \forall\ \omega$ B. $\lvert R_{neg}\rvert \leq \lvert Z_1(j\omega)\rvert, \forall\ \omega$ C. $\lvert R_{neg}\rvert \leq Im\ Z_1(j\omega), \forall\ \omega$ D. $\lvert R_{neg}\rvert \leq \angle\ Z_1(j\omega), \forall\ \omega$
29.	The quiescent collector current IC of a transistor is increased by changing resistances. As a result A. g_m will not be affected B. g_m will decrease C. g_m will increase D. g_m will increase or decrease depending upon bias stability.
30.	Average power absorbed by purely reactive components is A. Maximum B. Cannot be determined C. Zero D. Equal to resistive elements

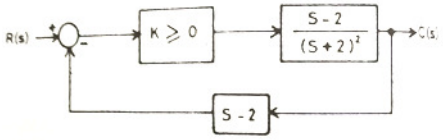
31.	For the lattice circuit shown in the figure, $Z_a = j2\Omega$ and $Z_b = 2\Omega$. The values of the open circuit impedance parameters, $Z = \begin{bmatrix} z_{11} & z_{12} \\ z_{21} & z_{22} \end{bmatrix}$ are:  A. $\begin{bmatrix} 1-j & 1+j \\ 1+j & 1+j \end{bmatrix}$ B. $\begin{bmatrix} 1-j & 1+j \\ -1+j & 1-j \end{bmatrix}$ C. $\begin{bmatrix} 1+j & 1+j \\ 1-j & 1-j \end{bmatrix}$ D. $\begin{bmatrix} 1+j & -1+j \\ -1-j & 1-j \end{bmatrix}$
32.	In the following graph, the number of trees (P) and the number of cut-sets (Q) are:  A. P=4, Q=6 B. P=4, Q=10 C. P=2, Q=2 D. P=2, Q=6

33.	In a common emitter configuration with BJT having Is=10^{-15}A, a collector resistor R_L=6.8kΩ and power supply V_{cc}=10V. Determine the value of V_{BE} required to operate transistor at V_{CE}=3.2V and the corresponding value of current I_L through R_L.  A. V_{BE}=69.8mV, I_L=1mA B. V_{BE}=69.8mV, I_L=10mA C. V_{BE}=690.8mV, I_L =1mA D. V_{BE}=690.8mV, I_L =10mA
34.	Determine the output frequency for a frequency division circuit that contains 12 flip-flops with an input clock frequency of 20.48MHz. A. 10.24 kHz B. 5 kHz C. 30.24 kHz D. 15 kHz
35.	Correlation A. It gives a measure of similarity between two data sequences. B. It gives a measure of dissimilarity between two data sequences C. A & B D. none of above
36.	A band limited signal is sampled at the Nyquist rate. The signal can be recovered by passing the samples through A. an RC filter B. an envelope detector C. a PLL D. an ideal low-pass filter with the appropriate bandwidth
37.	The peak to peak input to an 8 bit PCM coder is 2 volts. The signal power to quantization noise power ratio (in dB) for an input of 0.5 cos $\omega_m t$ is A. 47.8

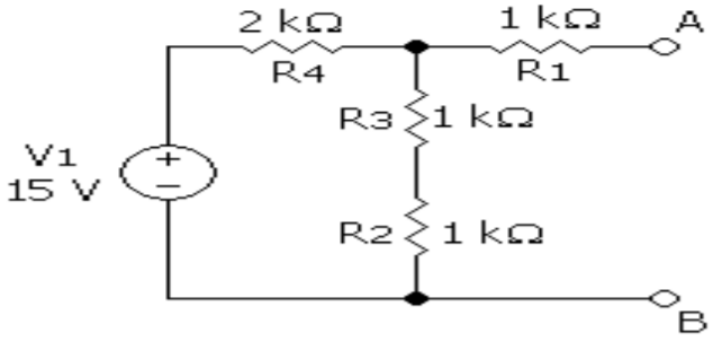
	B. 43.8 C. 95.6 D. 99.6
38.	A system is defined by its impulse response $h(n) = 2^n u(n-2)$. The system is: A. Stable and causal B. Causal but not stable C. Stable but not causal D. Unstable and non-causal
39.	The addressing mode in a microprocessor in which a register is used to hold the actual address where the data are stored is known as: A. Indexed Addressing Mode B. Register Direct Addressing Mode C. Register Indirect Addressing Mode D. Relative Addressing Mode
40.	The range of signed decimal numbers that can be represented by 6-bits 1's complement is: A. -31 to +31 B. -63 to +64 C. -64 to +63 D. -32 to +31
41.	What memory address range is NOT represented by chip #1 and chip #2 in the figure. Here A_0 to A_{15} are the address lines and CS means chip select A. 0100-02FF B. 1500-16FF C. F900-FAFF D. F800-F9FF

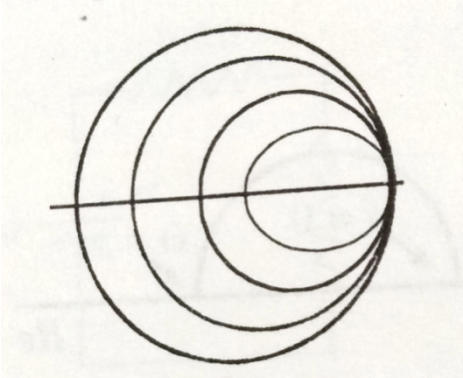


42.	For the logic circuit shown in figure, the simplified Boolean expression for the output, Y is:  A. X + Y+ Z B. X C. Y D. Z	
43.	Consider the sequence of 8085 instructions given below: LXI H, 9258, MOV A, M, CMA, MOV M, A Which one of the following is performed by this sequence? A. Contents of location 9258 are moved to the accumulator B. Contents of location 9258 are compared with the contents of the accumulator C. Contents of location 8529 are complemented and stored in location 8529 D. Contents of location 5892 are complemented and stored in location 5892	
44.	What are the minimum number of 2-to-1 multiplexers required to generate a 2-input AND gate and a 2-input Ex-OR gate? A. 1 and 2 B. 1 and 3 C. 1 and 1 D. 2 and 2	
45.	Figure given below shows the internal schematic of a TTL AND-OR-Invert (AOI) gate. For the inputs shown in the given figure, the output Y is:  A. 0 B. 1	

	C. AB D. $\overline{AB}$
46.	A linear system is described by the following state equation $\dot{X(t)} = A\,X(t) + B\,U(t), where\ A = \begin{bmatrix} 0 & 1 \\ -1 & 0 \end{bmatrix}$ The state-transition matrix of the system is A. $\begin{bmatrix} cos\ t & sin\ t \\ -sin\ t & cos\ t \end{bmatrix}$ B. $\begin{bmatrix} -cos\ t & sin\ t \\ -sin\ t & -cos\ t \end{bmatrix}$ C. $\begin{bmatrix} -cos\ t & -sin\ t \\ -sin\ t & cos\ t \end{bmatrix}$ D. $\begin{bmatrix} cos\ t & -sin\ t \\ cos\ t & sin\ t \end{bmatrix}$
47.	The voltage response of the network to unit step input is $Vo(s) = \frac{10}{s(s^2+8s+16)}$ A. Under damped B. Over damped C. Critically damped D. Can't be determined
48.	The feedback control system in the figure is stable.  A. for all K ≥ 0 B. only if K ≥ 1 C. only if 0 ≤ K < 1 D. only if 0 ≤ K ≤ 1
49.	Which of the following points is NOT on the root locus of a system with the open-loop transfer function $G(s)H(s) = \frac{k}{s\,(s+1)(s+3)}$ A. $s = -j\sqrt{3}$ B. $s = -1.5$ C. $s = -3$ D. $s = -\infty$
50.	Convolution of $x(t+5)$ with impulse function $\delta(t-7)$is equal to A. $x(t-12)$ B. $x(t+12)$ C. $x(t-2)$ D. $x(t+2)$
51.	A sequence $x(n)$ with the z-transform $X(z) = z^4 + z^2 - 2z + 2 - 3z^{-4}$ is applied as an input to a linear, time-invariant system with the impulse response $h(n) = 2\delta\,(n-3)$ where: $\delta\,(n) = \begin{cases} 1, n = 0 \\ 0, otherwise \end{cases}$ The output at n=4 is: A. -6

	B. zero C. 2 D. -4
52.	Which of the following points is NOT on the root locus of a system with the open-loop transfer function $G(s)H(s) = \frac{k}{s\,(s+1)(s+3)}$ A. $s = -j\sqrt{3}$ B. $s = -1.5$ C. $s = -3$ D. $s = -\infty$
53.	The autocorrelation function of a rectangular pulse of duration T is A. a rectangular pulse of duration T B. a rectangular pulse of duration 2T C. a triangular pulse of duration T D. a triangular pulse of duration 2T
54.	The fastest ADC is A. Counter type B. Flash Type C. Successive approximation type D. Dual slope type
55.	A differential amplifier has a differential gain of 2000 and a common mode gain of 0.2. The CMRR in dB is equal to A. 10000 B. 400 C. 80 D. 40
56.	Determine convolution sum of two sequences x(n) = {3, 2, 1, 2} and h(n) = {1, 2, 1, 2} A. y(n) = {3,8,8,12,9,4,4} B. y(n) = {3,8,3,12,9,4,4} C. y(n) = {3,8,8,12,9,1,4} D. y(n) = {3,8,8,1,9,4,4}
57.	Find two different continuous-time signals that will produce the sequence x(n) = cos(0.15 nπ) when sampled with a sampling frequency of 8 KHz. A. Sine(1200πt) and Cos(17200πt) B. Cos(1200πt) and Sine(17200πt) C. Cos(1200πt) and Cos(17200πt) D. Sine(1200πt) and Sine(17200πt)
58.	A source of angular frequency of 1rad/sec has source impedance consisting of 1Ω resistance in series with 1H inductance. The load that will obtain maximum power transfer is: A. 1Ω resistance

	B. 1Ω resistance in parallel with 1H inductance C. 1Ω resistance in series with 1F capacitor D. 1Ω resistance in parallel with 1F capacitor
59.	A medium bandwidth high-gain multistage transistor amplifier can be economically realized, if the coupling technique used between different stages is A. DC B. RC C. Transformer D. LC
60.	 The Thevenin's equivalent voltage of above circuit is: A. V_{AB}=7.5V B. V_{AB}=10V C. V_{AB}=5V D. V_{AB}=3.5V
61.	Let $x(t) \leftrightarrow X(j\omega)$ be Fourier Transform pair. The Fourier Transform of the signal $x(5t-3)$ in terms of $X(j\omega)$ is given as: A. $\frac{1}{5}e^{-\frac{j3\omega}{5}}X\left(\frac{j\omega}{5}\right)$ B. $\frac{1}{5}e^{\frac{j3\omega}{5}}X\left(\frac{j\omega}{5}\right)$ C. $\frac{1}{5}e^{-j3\omega}.X\left(\frac{j\omega}{5}\right)$ D. $\frac{1}{5}e^{j3\omega}.X\left(\frac{j\omega}{5}\right)$
62.	If the Laplace transform of a signal y(t) is $Y(s) = \frac{1}{s\,(s-1)}$, then its final value is: A. -1 B. 0 C. 1 D. unbounded
63.	A carrier is phase modulated (PM) with frequency deviation of 10kHz by a single tone frequency of 1kHz. If the single tone frequency is increased to 2kHz, assuming that the phase deviation remains unchanged, the bandwidth of the PM signal is:

	A. 21 kHz B. 22 kHz C. 42 kHz D. 44 kHz
64.	The impulse response $h[n]$ of a linear time-invariant system is given by $h[n] = u[n+3] + u[n-2] - 2u[n-7]$ where $u[n]$ is the unit step sequence. The above system is A. stable but not causal B. stable and causal C. causal but unstable D. unstable and not causal
65.	Many circles are drawn in a Smith chart used for transmission line calculations. The circles shown in the figure represent:  A. unit circles B. constant resistance circles C. constant reactance circles D. constant reflection coefficient circles
66.	The time base in a CRO is a A. Rectangular Waveform B. High frequency Sinusoidal waveform C. High frequency Sawtooth waveform D. Square waveform
67.	The minimum step-size required for a Delta-Modulator operating at 32K samples/sec to track the signal (here u(t) is the unit-step function) $x(t) = 125\,t\big(u(t) - u(t-1)\big) + (250 - 125t)(u(t-1) - u(t-2))$ so that the slope-overload is avoided, would be: A. 2^{-10} B. 2^{-8} C. 2^{-6} D. 2^{-4}
68.	In a GSM system, 8 channels can co-exist in 200 kHz bandwidth using TDMA. A GSM based cellular operator is allocated 5 MHz bandwidth. Assuming a frequency reuse factor

	of 1/5 i.e. a five-cell repeat pattern, the maximum number of simultaneous channels that can exist in one cell is: A. 200 B. 40 C. 25 D. 5
69.	When a plane wave travelling in free-space is incident normally on a medium having ε_r = 4.0, then the fraction of power transmitted into the medium is given by: A. $\frac{8}{9}$ B. $\frac{1}{2}$ C. $\frac{1}{3}$ D. $\frac{5}{6}$
70.	Which of the following is strictly bounded? A. $\frac{1}{x^2}$ B. e^x C. x^2 D. e^{x^2}
71.	A transmission line is distortionless if: A. $RL = \frac{1}{GC}$ B. $RL = GC$ C. $LG = RC$ D. $RG = LC$
72.	The impulse response *h(t)* of a linear time-invariant continuous time system is described by $h(t) = \exp(\alpha t)u(t) + \exp(\beta t)u(t-1)$, where u(t) denotes the unit step function, and α and β are real constants. This system is stable if A. α is positive and β is positive B. α is negative and β is negative C. α is positive and β is negative D. α is negative and β is positive
73.	An input voltage $v(t) = 10\sqrt{2}\cos(t + 10^0) + 10\sqrt{5}\cos(2t + 10^0)V$ is applied to a series combination of resistance R = 1Ω and an inductance L=1H. The resulting steady-state current i(t) in ampere is: A. $10\cos(t + 55^0) + 10\cos(2t + 10^0 + tan^{-1}2)$ B. $10\cos(t + 55^0) + 10\sqrt{\frac{3}{2}}\cos(2t + 55^0)$ is C. $10\cos(t - 35^0) + 10\cos(2t + 10^0 - tan^{-1}2)$ D. $10\cos(t - 35^0) + 10\sqrt{\frac{3}{2}}\cos(2t - 35^0)$
74.	The region of convergence of Z-transform of the sequence $\left(\frac{5}{6}\right)^n u(n) - \left(\frac{6}{5}\right)^n u(-n-1)$must be

	(A) $\|z\| < \frac{5}{6}$ (B) $\|z\| > \frac{6}{5}$ (C) $\frac{5}{6} < \|z\| < \frac{6}{5}$ (D) $\frac{6}{5} < \|z\| < \infty$
75.	The transfer function of a system is given by $H(s) = \frac{1}{s^2\,(s-2)}$. The impulse response of the system is: (where * denotes convolution and U(t) is a unit step function.) A. $(t^2 * e^{-2t})U(t)$ B. $(t * e^{2t})U(t)$ C. $(t.e^{-2t})U(t)$ D. $(t.e^{2t})U(t)$

MSc(HS)(Biochemistry)

1. The commonly used terms as glucose residues means;
- **A.** Free glucose molecules in fisher form
- **B.** Glucose molecules in a racemic mixture
- **C.** Glucose molecules in chain joined after removal of water
- **D.** Glucose obtained after epimerization of galactose

2. All except one of the following catalyze the anaplerotic reactions;
- **A.** PEP carboxykinase
- **B.** Malic enzyme
- **C.** Pyruvate carboxylase
- **D.** Malate dehydrogenase

3. Find out the correct type of cell that is most effective for destroying intracellular pathogen;
- **A.** Myeloma cells
- **B.** B Cells
- **C.** T helper Cells
- **D.** Cyotoxic T Cells

4. Which of the following combination requires primer for their net synthesis?
- **A.** Cellulose synthesis and DNA synthesis
- **B.** Glycogen synthesis and DNA synthesis
- **C.** Glycogen synthesis and RNA synthesis
- **D.** Cellulose synthesis and RNA synthesis

5. Ouabain, a cardiac glycoside inhibits Na^+K^+ ATPase through which of the following ways;
- **A.** By decreasing the fluidity of membrane near pump
- **B.** By increasing the fluidity of membrane near pump
- **C.** Intracellular binding to pump
- **D.** Extracellular binding to pump

6. Which of the following does not represent protein posttranslational modification's;
- **A.** Incorporation of proline in a protein
- **B.** Acetylation of a protein
- **C.** Phosphorylation of a protein
- **D.** Glycosylation of a protein

7. Which of the following best explains the nick translation;
- **A.** Synthesis of new protein
- **B.** Extension of single phosphoester break
- **C.** Extension of already existing protein.
- **D.** Synthesis of glycoproteins

8. The first stage in the assimilation of CO_2 into biomolecules is;
- **A.** Condensation of $CO_2$with a two carbon acceptor

B. Condensation of $CO_2$with a three carbon acceptor
C. Condensation of $CO_2$with a four carbon acceptor
D. Condensation of $CO_2$with a five carbon acceptor

9. Hydrogen carrier used in dehydrogenation of succinic acid to fumaric acid is;
A. FAD
B. NADP
C. Oxidized glutathione
D. NAD+

10. The peptidoglycan in bacterial envelopes is an alternating copolymer of;
A. N-acetylglucosamine and N-acetylmuramic acid linked by β 1->4 Glycosidic bonds
B. N-acetylglucosamine and N-acetylmuramic acid linked by α 1->4 Glycosidic bonds
C. N-acetylglucosamine and N-acetylmuramic acid linked by β 1->2 Glycosidic bonds
D. N-acetylglucosamine and N-acetylmuramic acid linked by α 1->2 Glycosidic bonds

11. Which of the following is an example of substrate level phosporylation;
A. Conversion of Glucose to glucose 6 phosphate
B. Phosphatase action on protein phosphorylated at serine/ theronine
C. Conversion of 1,3-bisphosphoglycerate to 3-phosphoglycerate
D. Phosphatase action on protein phosphorylated at tyrosine

12. Which of the following best describes the antibodies;
A. Globular proteins
B. Fibrous proteins
C. Prion proteins
D. Synaptic proteins

13. DNA replication between prokaryotes and eukaryotes differs in which of the following aspect;
A. RNA primes DNA synthesis in prokaryotes and not in eukaryotes
B. A single origin of replication in prokaryotes and multiple in eukaryotes
C. Bidirectional replication in prokaryotes and unidirectional in eukaryotes
D. DNA directed DNA polymerase enzyme in prokaryotes and RNA directed DNA polymerase in eukaryotes

14. The wobble rule in the genetic code explains which of the following;
A. The degeneracy in the 3'site of codon
B. The degeneracy in the 5'endof the codon
C. The degeneracy in the 3' end of the anticodon
D. The degeneracy in middle nucleotide of codon and anticodon

15. NADPH generated from pentose phosphate pathway yields reducing power for;
A. Biosynthesis of carbohydrates
B. Biosynthesis of nucleic acids
C. Biosynthesis of amino acids
D. Biosynthesis of fatty acids

16. Which of the following best describe chimera;

A. An animal composed of cells originating from two or more embryo
B. An animal composed of additional appendages due to embryo asymmetric cleavage
C. An animal composed of cells originating from skin cells of same individual
D. An animal composed of cells originating from stromal stem cells

17. The first ever amino acid decoded by Nirenberg and Matthaei using a RNA composed of poly-Uracil was;

A. Phenylalanine
B. Methionine
C. Tyrosine
D. Glycine

18. The following neurotransmitters are derivatives of tyrosine, except;

A. Dopamine
B. Epinephrine
C. Norepinephrine
D. Histamine

19. Which one of the following amino acids can interrupt α-helices and also disrupts β Sheets;

A. Phe
B. Cys
C. His
D. Pro

20. The lysosomal enzymes share an important and unique property. Identify the correct Answer;

A. Show an optimal activity at a neutral pH
B. Show an optimal activity at an acidic pH
C. Show an optimal activity at an alkaline pH
D. Show an optimal activity at every pH point

21. Which of the following definition is most appropriate for Ribozymes**?**

A. Ribosomes with enzymatic activity
B. Enzymes associated with ribosome biogenesis
C. Enzymes involved in biosynthesis of ribosomal DNA
D. Ribonucleic acid with catalytic activity.

22. Methotrexate is known to inhibit cancer cell growth due to which of the following;

A. Competitively inhibits DNA Ligase enzyme
B. Competitively inhibits DNA Polymerase
C. Competitively inhibits Dihydrofolate reductase enzyme
D. Competitively inhibits peptidyl transferase enzyme

23. Identify the correct steps of Pyruvate degradation in alcoholic fermentation reaction;

A. Pyruvate → Acetaldehyde →Ethanol
B. Pyruvate → Lactate →Ethanol

C. Pyruvate → Malonyl CoA →Ethanol
D. Pyruvate → Glycerate →Ethanol

24. Out of the following mentioned chemical reactivity, which one best describes the action of DNA ligases;
A. DNA ligase is a polymerase
B. DNA ligase catalyzes oxidation –reduction reaction
C. DNA ligase catalyzes formation of a phophoester bond
D. DNA ligase catalyzes the hydrolysis of a peptide bond

25. The cells that have undergone genetic modifications to grow indefinitely will be termed as;
A. Primary cell culture
B. Secondary cell culture
C. Cell Strain
D. Cell line

26. Which of the following forms of electrophoresis can resolve long DNA molecules >100 kb in size;
A. Standard Agarose gel electrophoresis
B. SDS-polyacrylamide gel electrophoresis
C. Native polyacrylamide gel electrophoresis
D. Pulsed field gel electrophoresis

27. Highest amount of triglycerides is present in;
A. Very low density lipoprotein
B. Low density lipoprotein
C. High density lipoprotein
D. Chylomicrons

28. Any genetic change that can be identified to occur in more than one percent of the population is defined as;
A. Gene Polymorphism
B. Gene Duplication
C. Gene Redundancy
D. Genetic Mutation

29. Which of the following mentioned chromatography's can be used to separate the proteins on the basis of their molecular weight ?
A. Ion-Exchange Chromatography
B. Molecular Exclusion Chromatography
C. Affinity Chromatography
D. Adsorption Chromatography

30. To which of the peptidase categories does Pepsin belong to;
A. Endopeptidase
B. Exopeptidase
C. Carboxypeptidase
D. Aminopeptidase

31. Varying salt concentrations lead to precipitation of different proteins due to which of the following characteristic;

A. Due to Differences in ionic and hydrophobic composition of different proteins
B. Due to globular nature of proteins
C. Due to fibrous nature of proteins
D. Due to association of proteins with nucleotides.

32. Purines and pyrimidines can often exist in their tautomeric forms, these tautomers are easily converted isomers that differ in which of the following;

A. Position of sulfur
B. Position of hydrogen
C. Position of oxygen
D. Position of nitrogen

33. During the chain termination method of DNA sequencing, which of the following functions as chain terminators;

A. 2'-deoxy ribonucloside 5'-triphosphate
B. 2', 3' dideoxy nucleoside 5' triphosphate
C. 2' deoxy-adenosine 5' triphosphate
D. 2'deoxy thymidine 5' triphosphate

34. For a particular protein, how many potential open reading frame can exist;

A. One
B. Two
C. Four
D. Six

35. The α-carboxylic acid group of Glycine amino acid has pK value of 2.35 while for its α-amino group pK is 9.78. identify, which species of glycine would predominate at pH below 2.35;

A. $^{+}H_3NCH_2COO^{-}$
B. H_2NCH_2COOH
C. $H_2NCH_2COO^{-}$
D. $^{+}H_3NCH_2COOH$

36. During purification of proteins by ion exchange chromatography, an anoin exchanger resin would possess which of the following group;

A. A hydrophobic group
B. Both Cationic and anionic groups
C. Cationic group
D. Anionic group

37. During SDS-PAGE, the separation of protein is based on their molecular masses rather than charge. Which of the following contributes to such an effect.

A. SDS to protein binding ratio of 1.4 g SDS per gram of Protein

B. SDS lend net positive charge on all the proteins
C. SDS causes denaturation of proteins so all proteins become neutral
D. SDS hydrolyzes proteins in stack of low to high molecular weight proteins

38. One of the most common accepted reasons for the β-D-glucose being the most abundant monosaccharide in nature is due to;
A. Presence of all five of its non-H substituent's in equatorial position
B. Presence of all five of its non-H substituent's in axial position
C. Excessive availability in nature
D. Being end product of all complex carbohydrates

39. Which one of the following glycero-phospholipid possess ether linkage instead of ester linkage;
A. Lecithin
B. Plasmalogen
C. Cephalin
D. Lysolecithin

40. Cold blooded animals such as fish maintain the constant level of their membrane fluidity by which of the following process;
A. Through lipid synthesis and degradation
B. Through increasing synthesis of proteins
C. Through developing coating of glycoproteins
D. Through diving deep under sea

41. Shine Dalgarno sequences are present on which of the following biomolecules;
A. 3'end of mRNA
B. 5' end of mRNA
C. 5' end of rRNA
D. 3' End of rRNA

42. The clathrin, which forms a polyhedral framework around vesicles during transport process is an example of ;
A. Nucleotide based scaffold
B. Mixture of lipids and carbohydrate
C. A complex carbohydrate
D. A Protein

43. One of most commonly used marker for targeting proteins to lysosomes is;
A. Erythrose -4 -phosphate
B. Ribulose -5- phosphate
C. Mannose -6- phosphate
D. Sedudoheptulose -7- phosphate

44. Addition of amino acid sequence KDEL to the c-terminal of soluble proteins target such proteins to ;

A. Nucleotide based scaffold
B. Endoplasmic reticulum
C. Cytosol
D. Golgi complex

45. The reaction catalysed by one of the following enzyme uses RNA as the catalytic moiety;
A. Topoisomerase
B. Ribonuclease
C. Amino-acyl tRNA synthetase
D. Peptidyl transferase

46. The granulocytes are classified into which of the following classes;
A. Neutrophils, Eosinophils and basophils
B. Neutrophils, Eosinophils and Acidophils
C. Acidophils, Eosinophils and basophils
D. Acidophils, Eosinophils and Neutrophils

47. All of the following statements are true for T cells except, one. Identify the false statement;
A. T cells arise in the bone marrow.
B. T cells develop in the thymus.
C. T cells have been characterized in three well defined subpopulations.
D. T cells of different subpopulations can have origin either in bone marrow or thymus.

48. All, except one of the following does not represent counter-regulatory hormones working against insulin in raising blood glucose levels in response to hypoglycemia;
A. Glucagon
B. Thyroxine
C. Epinephrine
D. Cortisol

49. A bone macrophage is termed as;
A. Osteoclast
B. Osteoblast
C. Osteomast
D. Osteocyte

50. Which of the following statement is not true for Prostaglandins
A. These are biologically active lipid derivatives of arachidonic acid
B. They mediate inflammatory responses
C. They inhibit platelet aggregation
D. They decrease vascular permeability

51. Homolgous proteins with same function in different species are termed as;
A. Orthologous

B. Paralogous
C. Synlogous
D. Heterologous

52. In the prion disease like mad cow disease , the infective agent is known to be a prion, the nature of which is;
A. Protein
B. Nucleic acid
C. Complex carbohydrate
D. Lipid based signaling molecule

53. A variety of soluble factors contributing to innate immunity are listed below. One of the answers mentioned here is incorrect. Identify the incorrect answer;
A. Lysozyme
B. Interferons
C. Complement proteins
D. Adhesins

54. All the following statements are true for prosthetic groups in a protein, except one. Identify the false statement;
A. The prosthetic group of flavoproteins are derived from vitamin B_2 .
B. The prosthetic group of Ubiquinone a lipid soluble molecule can accept and donate electrons.
C. All the prosthetic groups are always non-amino acid components.
D. Copper atoms can act as prosthetic groups in proteins.

55. All the following mentioned molecules are neurotransmitters, except one;
A. Norepinephirne
B. Acetyl-choline.
C. Gamma amino butyric acid.
D. Gamma glutamyl cysteinyl glycine

56. All the following mentioned energy data required to cleave a bonding status is true. One of the data is false, identify that data;
A. Covalent bond~ 80 -100 kilocalories /mol
B. Hydrogen bond~ 2 -5 kilocalories /mol
C. Ionic bond about ~3 kilocalories /mol
D. Van der Waals force~ 1-3 kilocalories /mol

57. Chitin the primary component of the outer cytoskeleton in insects is a polymer of;
A. Unbranched polymer of N-acetyl glucosamine
B. Branched polymer of N-acetyl glucosamine
C. UnBranched polymer of N-acetyl glucosamine and glucosamine
D. Branched polymer of N-acetyl glucosamine and glucosamine

58. Identify the correct set of pyrimidines;

A. Adenine, Cytosine
B. Thymine, Cytosine
C. Thiamine, Uracil
D. Thiamine, Guanine

59. Identify the correct set of enzymes in glycolytic pathway catalyzing directly ATP providing reactions;
A. Hexokinase and Pyruvate kinase
B. Phosphpfructokinase and Pyruvate kinase
C. Phosphoglycerate kinase and Pyruvate kinase
D. Enolase and Pyruvate kinase

60. During enzyme inhibition both apparent Km and Vmax decrease during which type of enzyme inhibition;
A. Suicide inhibition
B. Competitive inhibition
C. Mixed (non-competitive)
D. Uncompetitive

61. The terminal electron acceptor during electron transport or respiratory chain is ;
A. Oxygen
B. Water
C. NAD^+
D. FAD

62. Which one of the following represents the gratuitous inducer for *lac* operon;
A. Lactose
B. Galactose
C. Isopropyl thio galactoside
D. Glucose

63. With respect to glycolysis, which of the following represents Pasture effect;
A. Accumulation of lactic acid in presence of oxygen in anaerobic cell
B. No net change in formation of glycolytic intermediates in presence of oxygen in anaerobic cell
C. Increased synthesis of glycolytic intermediates in presence of oxygen in anaerobic cell
D. Inhibition of glycolytic intermediates in presence of oxygen in anaerobic cell

64. Which one of the following enzyme utilizes six different coenzymes to catalyze the product formation;
A. Peptidyl transferase
B. Pyruvate dehydrgenase
C. Lipoxygenase
D. F_0F_1ATPase A complex

65. One of the anabolic variant of citric acid cycle that leads to net synthesis of carbohydrate from fats in some species is represented by which one of the following;

A. Glucuronic acid cycle
B. Kreb's cycle
C. Cori cycle
D. Glyoxalate Cycle

66. The Net ATP synthesis from one molecule of Palmitate comes out to be;
A. 30 ATP molecules
B. 129 ATP molecules
C. 229 ATP molecules
D. 16 ATP molecules

67. Which among the following represents the major fate of glucose formed by gluconeogensis is;
A. In the synthesis of glycogen in nervous tissue.
B. Catabolism of glucose by Nervous tissue
C. Synthesis of glycogen in skeletal muscle
D. Regulation of blood glucose

68. During the light reaction the sunlight is used to carry out photochemical oxidation of H_2O. Which of the following two specific things are accomplished during this reaction;
A. Formation of NADPH and ATP
B. Formation of Carbohydrate and ATP production
C. Formation of $FADH_2$ and NADPH
D. Formation of $FADH_2$ and ATP

69. Cancer cell are genetically unstable and have highly aberrant chromosome compliments. This type of condition is termed as;
A. Aneuploidy
B. Diploidy
C. Monoploidy
D. Heteroploidy

70. Which of the following definitions is best suited to describe phenomenon of florescence;
A. Absorb light as UV radiations and release a portion in visible wavelengths
B. Absorb light as IR radiations and release a portion in visible wavelengths
C. Absorb light as Visible radiations and release a portion in UV wavelengths
D. Absorb light as Visible radiations and release a portion in IR wavelengths

71. In two dimensional gel electrophoresis technique;
A. First the proteins are resolved on anonic character then Mass
B. First the proteins are resolved on cationic character then Mass
C. First the proteins are resolved on Isoelectric point then Mass
D. First the proteins are resolved on Mass then Isoelectric point

72. During C4 cycle which of the following event occur;

A. Incorporation of CO_2 to C_4 intermediate
B. Release of CO_2 from to C_4 intermediate
C. Cyclic exchange of C_8 to C_4 compounds
D. Hydrolysis of C_8 compounds to C_4 compounds

73. During starvation brain uses which of the following biomolecules for fuel generation;
A. Sorbitol
B. Glycated heamoglobin
C. Glucose
D. Ketone Bodies

74. Most of the nitrogen that finds its way from ammonia to amino acids and other nitrogenous compounds is brought about by which of the following amino acid;
A. Aspartate and argenine
B. Glutamate and glutamine
C. Argenine and lysine
D. Serine and glycine

75. Which of the following compound function as carrier upon which carbon and nitrogen atom are assembled that eventually forms urea;
A. Citrulline
B. Ornithine
C. Argenine
D. Arginosuccinate

x-x-x

MSc(HS)(Computer Science)

1. For implementing C++ programs, which of the following is considered the most common way?

A) C++ programs are directly compiled into native code by a compiler.
B) C++ programs are first compiled to intermediate code by a compiler and then executed by a virtual machine.
C) C++ programs are interpreted by an interpreter.
D) C++ directly compiles and executes the program.

2. If class P is friend of class Q and class Q is friend of class R in a C++ program, which of the following is true?

A) Class R is friend of class P.
B) Class P is friend of class R.
C) Class P and Class R do not have any friend relationship.
D) All are friends.

3. In a group of nested loops in C/C++, which loop is executed the maximum number of times?

A) Cannot be determined
B) All loops are executed same number of times
C) The outermost loop
D) The innermost loop

4. What is the output of following C++ program?

```
int var1 = 25;
int main()
{
        int var1 = 70;
        cout << var1 << ::var1;
}
```

A) Syntax error
B) 2570
C) 70 25
D) 70 70

5. In context of C++, following is an example of _____ .

```
class derived: public base1, public base2 { }
```

A) Polymorphic inheritance
B) Multilevel inheritance
C) Hierarchical inheritance
D) Multiple inheritance

6. When new data items are to be inserted into a data structure, but there is no available space; this situation is usually known as _____ .

A) Houseful B) Saturated C) Underflow D) Overflow

7. Which of the following is the most quickly accessible storage to processors?

A) RAM B) Registers C) Disks D) Pen Drive

8. Which logic gate is indicated by the following truth table?

A	B	X
0	0	0
0	1	1
1	0	1
1	1	0

A) Exclusive NOR B) Exclusive OR

C) NAND D) OR

9. In the relational model of database systems, relationships between tables are created using _____ .

A) Composite keys B) Determinants

C) Candidate keys D) Foreign keys

10. In mobile communication, a _____ is responsible for connecting cells, recording call information, billing etc.

A) Cell B) Base Station (BS)

C) Mobile Station (MS) D) Mobile Switching Centre (MSC)

11. In web applications, JavaScript is used to _____ .

A) Style html pages

B) Execute query related to database on server

C) Add interactivity to a web page

D) Perform server side operations

12. Which HTML tag inserts a line horizontally on your web page?

A) <tr> B) <hr>

C) <line> D) <line direction=”horizontal”>

13. Which of the following is not a major type of Cloud Computing?

A) Hardware as a Service (HaaS) B) Platform as a Service (PaaS)

C) Software as a Service (SaaS) D) Infrastructure as a Service (IaaS)

14. What will be printed by the following C++ program?

```
void fun1 (int *b)
{
        *b = 1;
}
int main ()
{
```

```
    int *a;
    int n;
    a = &n;
    *a = 0;
    fun1 (a);
    cout << *a << endl;
}
```

A) 0 B) 1 C) The address of a D) The address of n

15. In the context of e-mails, 'spam' is _____.

A) The act of overloading an e-mail server by using denial-of-service attacks
B) An e-mail message that is infected with viruses
C) A large quantity of messages that do not reach the recipients
D) Unsolicited advertising sent to a large number of recipients

16. The data storage hierarchy consists of _____ .

A) bits, bytes, fields, records, files and databases
B) bits, bytes, records, fields, files and databases
C) bits, bytes, fields, files, records and databases
D) bytes, bits, fields, records, files and databases

17. Which of the following statement(s) is/are TRUE?

S1: The decimal number 10 is larger than the hexadecimal number 10.
S2: In the binary number 1110.101, the fractional part has the decimal value as 0.625.

A) SI only B) S2 only
C) Both S1 and S2 D) Neither S1 nor S2

18. The file extensions such as gif, jpg, bmp, png are used to store_____ .

A) Text data B) Audio data C) Image data D) Video data

19. Encoding or scrambling data for transmission across a network is known as_____.

A) Decryption B) Protection C) Detection D) Encryption

20. The first generation of computers was characterized by _____ .

A) Microprocessors B) Integrated circuits
C) Transistors D) Vacuum tubes

21. _____ is known as father of World Wide Web (WWW).

A) Jim Clark B) Ted Nelson C) Tim Berner Lee D) Tim Thompson

22. A client machine usually needs _____ to send e-mails.

A) Only SMTP B) Only POP
C) Both SMTP and POP D) Neither SMTP nor POP

23. User Datagram Protocol (UDP) needs _____ address to deliver the user datagram to the correct application program.

A) Port B) Application C) Internet D) Physical

24. Identify the class of IP address 219.8.7.6.

A) Class A B) Class B C) Class C D) Class D

25. In data communications, ATM is an acronym for _____ .

A) Automated Teller Machine
B) Asynchronous Transfer mode
C) Automatic Transmission Model
D) Asynchronous Telecommunication Method

26. At data link layer, flow control is required to prevent _____

A) Bit errors B) Overflow of sender buffer
C) Overflow of receiver buffer D) Collision between sender and receiver

27. In data communication, which error detection method involves polynomials?

A) Simple parity check B) Two-dimensional parity check
C) Checksum D) Cyclic Redundancy Check (CRC)

28. The infix expression (A * B + C) is correctly represented in postfix notation as _____ .

A) A B C * + B) A B C + * C) A B * C + D) A B + C *

29. The result of addition $(167)_8 + (250)_8$ is _____ .

A) 437_8 B) 313_8 C) 287_8 D) 417_8

30. A relational table is said to be in the _____ , if there is no transitive functional dependency.

A) First Normal Form (1NF) B) Second Normal Form (2NF)
C) Third Normal Form (3NF) D) Fourth Normal Form (4NF)

31. If a host is assigned IP address 222.45.97.67 and the subnet mask 255.255.255.224, what is the subnet address?

A) 222.45.97.32 B) 222.45.97.65 C) 222.45.97.12 D) 222.45.97.64

32. Suppose an image is to be displayed in a web page to cover 25% of the browser window horizontally and 35% vertically. The _____ and _____ attributes of the <*img*> tag will be used respectively for this.

A) Width, Height B) Height, Width C) Width, Length D) Height, Length

33. What will be the output of following C program?

```
# include <stdio.h>
int main( )
{
    int i = 2;
```

```
    for(i = 0; 0; i < 3)
    printf("\n %d", i);
    printf("\t Computer");
}
```

A) 2 2 B) 0 Computer C) 0 1 2 Computer D) Computer

34. _____ is a wireless technology that connects devices for exchanging data over very short distances using short-wavelength radio waves.

A) Wi-Fi B) Bluetooth C) Infrared D) Ultraviolet

35. Convert the following :

$(11010101)_2 = (.....)_8$

A) 325 B) 326 C) 652 D) 625

36. For singly linked list of length n, _____ number of comparisons are needed to search for a given element in the worst case.

A) $\log_2 n$ B) $\frac{n}{2}$ C) $n \log_2 n$ D) n

37. If Q means 'add to', J means 'multiply by', T means 'subtract from' and K means 'divide by', then

40 K 2 Q 3 J 6 T 7 = ?

A) 18 B) 28 C) 31 D) 133

38. In a lottery, there are 15 prizes and 30 blanks. A lottery is drawn at random. What is the probability of getting a prize?

A) $\frac{1}{3}$ B) $\frac{1}{2}$ C) $\frac{2}{3}$ D) $\frac{1}{4}$

39. What would be the correct sequence of steps for software development process?

i.	Test	**ii.**	Design	**iii.**	Install
iv.	Specification	**v.**	Manufacture	**vi.**	Maintain

A) ii, iv, v, i, vi, iii B) iv, ii, v, i, iii, vi
C) ii, iv, v, i, iii, vi D) iv, ii, v, i, vi, iii

40. Consider the following Java code:

```
public final class two extends one
{
// ...
}
```

What is the meaning of "final" in the declaration of class *two* above?

A) This is the final version of class one, which should be used if multiple versions are present
B) Class one need not to be instantiated to invoke its methods in class two
C) No method of class one can be overridden
D) Two cannot be sub-classed

41. A DNS server translates _____ of another computer into _____ and vice versa.

A) Domain name, IP address B) Host address, domain name
C) Domain name, server address D) Server name, IP address

42. In context of an operating system, _____ refers to a situation in which a process is ready to execute but is continuously denied access to a processor in deference to other processes.

A) Synchronization B) Mutual exclusion
C) Dead lock D) Starvation

43. Assume every process requires 4 seconds of service time in a system with single processor. If new processes are arriving at the rate of 5 processes per minute, then estimate the fraction of time CPU is busy in system?

A) 66% B) 33% C) 50% D) 20%

44. In database management systems, _____ level of abstraction describes how the data is actually stored in memory.

A) Conceptual B) View C) Physical D) External

45. A graph is a collection of nodes, called _____ and line segments called _____ which connect pair of nodes.

A) Vertices, edges B) Edges, vertices
C) Vertices, paths D) Graph point, edges

46. Which of the following best describes the process of data streaming?

A) Playing multimedia file after complete download of a file
B) Playing multimedia file without being completely downloaded first
C) Reducing the load time of a Web page
D) Sending packets to a Web server to improve its performance

47. In animation, a _____ is a frame in which the artwork differs significantly from that of the previous frame.

A) Lock frame B) Tweening C) Key frame D) Cell

48. Which of the following refers to e-waste?

A) Waste from nuclear generation B) Discarded electronic appliances
C) Eco-freiendly waste D) Hazardous chemical waste

49. Which one of the following is not one of the major types of e-commerce?

A) B2B B) B2C C) C2B D) C2C

50. The Secure Electronic Transaction (SET) protocol is used for _____.

A) Credit card payment
B) Cheque payment
C) Electronic cash payments

D) Payment of small amounts for internet services

51. In Unix/Linux, _____ permission is assigned by the following command
chmod 754 myfile.txt

A) -rwxrw-r- -
B) –rwxr--r- x
C) -rwxr-xr- -
D) –rw-rw-r- x

52. In _____ disk scheduling policy, when the last track has been visited in one direction, the arm is returned to the opposite end of the disk and the scan begins again.

A) Last in first out
B) Shortest service time first
C) SCAN
D) Circular SCAN

53. Memory management technique in which system stores and retrieves data from secondary storage for use in main memory is called_____.

A) Fragmentation
B) Paging
C) Mapping
D) Buffering

54. The result of an arithmetic and logical operation is stored in _____,

A) Accumulator
B) Cache Memory
C) ROM
D) Instruction Registry

55. The unit which decodes and translates each instruction and generates the necessary signals for ALU and other units is called _____ .

A) ALU B) Control Unit C) CPU D) Logical Unit

56. The performance of the cache memory is measured in terms of _____ .

A) Hit ratio B) Chat ratio C) Copy ratio D) Data ratio

57. Inserting an item into the stack when stack is not full is called _____ operation and deletion of item form the stack, when stack is not empty is called _____ operation.

A) Push, pop B) Pop, push C) Insert, delete D) Delete, insert

58. In the _____ traversal of a graph, we process all the descendants of a vertex before we move to an adjacent vertex.

A) Breadth First B) With First C) Depth First D) Depth Limited

59. _____ is considered the first step in software project planning.

A) Determining the budget
B) Establishing the objectives and scope
C) Selecting a team organizational model
D) Determining the project constraints

60. For software, Acceptance tests are normally conducted by the _____ .

A) Developers B) Test team C) System engineers D) End users

61. In SQL, which of the following is not a Data Definition Language (DDL) command?
A) RENAME B) DROP C) ALTER D) UPDATE

62. Which of the following SQL statements is correct?
A) SELECT Username AND Password FROM Users
B) SELECT Username AND Password WHERE Username = 'user1'
C) SELECT Username, Password FROM Users
D) SELECT Username, Password WHERE Username = 'user1'

63. Which of the following is non-liner data structure?
A) Stacks B) List C) Strings D) Trees

64. The best case time complexity of quick sort is expressed as _____ .
A) O(n) B) $O(n^2)$ C) O(n log n) D) O(log n)

65. What is the output of following C program?

```
void main()
{
int a=b=c=10;
printf("\n %d %d %d",a,b,c); }
```

A) 10 10 10 B) 0 0 0
C) Compile Time Error D) Three Garbage Values

66. What will be the output of following C code snippet?

```
#define SQUARE(X)  (X * X)
int main ( )
{
printf ("Square = %d" , SQUARE(12) );
}
```

A) Square= 144 B) Square= 32 C) Square= 104 D) Square= 12

67. In C, a function returns a value of type _____ by default.
A) Int B) Char C) Float D) Void

68. In C, a static integer variable by default gets initialized to _____ .
A) 0 B) 1 C) Blank space D) Garbage value

69. If an expression contains relational, assignment and arithmetic operators in C. If parenthesis are not present, the order of evaluation will be _____
A) Assignment, arithmetic, relational B) Relational, arithmetic, assignment
C) Assignment, relational, arithmetic D) Arithmetic, relational, assignment

70. In SQL, a _____ is a virtual table based on the result-set of a 'Select' statement.
A) Synonym B) View C) Sequence D) Transaction

71. Which of the following collection class of VB.NET represents a last-in, first out collection of objects?

A) ArrayList B) Hashtable C) SortedList D) Stack

72. Which of the following PHP statement/statements will store 111 in variable num?

I. int $num = 111;
II. int num = 111;
III. $num = 111;

A) Both I and II B) Only II C) Only III D) Only I

73. In Java, which of these methods can be used to output a sting in an applet?

A) Display() B) Print() C) Showstring() D) Drawstring()

74. Which one is a valid declaration of a Boolean in Java?

A) Boolean b1 = 1; B) Boolean b2 = 'false';
C) Boolean b3 = false; D) Boolean b4 = 'true';

75. Which of these keywords is used to generate an exception object explicitly in Java?

A) Try B) Finally C) Throw D) Catch

x-x-x

M.E.(Chemical)

1. The remainder when 7^{84} is divided by 342 is
(A) 0 (B) 1 (C) 49 (D) 341

2. $A = \begin{bmatrix} 5 & 0 & 2 \\ 0 & 3 & 0 \\ 2 & 0 & 1 \end{bmatrix}$. The inverse of A is

(A) $\begin{bmatrix} 1 & 0 & -2 \\ 0 & 1/3 & 0 \\ -2 & 0 & 5 \end{bmatrix}$ (B) $\begin{bmatrix} 5 & 0 & 2 \\ 0 & -1/3 & 0 \\ 2 & 0 & 1 \end{bmatrix}$

(C) $\begin{bmatrix} 1/5 & 0 & 1/2 \\ 0 & 1/3 & 0 \\ 1/2 & 0 & 1 \end{bmatrix}$ (D) $\begin{bmatrix} 1/5 & 0 & -1/2 \\ 0 & 1/3 & 0 \\ -1/2 & 0 & 1 \end{bmatrix}$

3. Value of the integral I= $\int_0^{\pi/4} cos^2 x \, dx$ is
(A) π/8 + 1/4 (B) π/8 – 1/4
(C) - π/8 – 1/4 (D) - π/8 + ¼

4. Differential equation for the variation of the amount of salt x in a tank with time t is given by $\frac{dx}{dt} + \frac{x}{20} = 10$ where x is in kg and t is in minutes. Assuming that there is no salt in the tank initially, the time (in mins) at which the amount of salt increases to 100 kg is
(A) 10 ln 2 (B) 20 ln 2 (C) 50 ln 2 (D) 100 ln 2

5. If 20% managers are technocrats, the probability that a random committee of 5 managers consists of exactly 2 technocrats is
(A) 0.2048 (B) 0.4000 (C) 0.4096 (D) 0.9421

<u>Common Data Q. 6-7.</u>
Solid calcium oxalate dissociates at high temperatures into solid calcium carbonate and carbon monoxide.

$$CaC_2O_4\ (s) \Leftrightarrow CaCO_3\ (s) + CO\ (g)$$

The equilibrium pressure of CO between 670 and 700 K is given by ln P = 14.4 – (9600/T) where P is in atm and T is in K. Assume ideal behaviour and 675 K temperature

6. ΔG^o will be
(A) -986 kJ (B) -992 kJ (C) -998 kJ (D) -994 kJ

7. ΔS^o will be
(A) 98.7 kJ/K (B) 102.7 kJ/K (C) 108.7 kJ/K (D) 119.7 kJ/K

8. The equation dU = T dS – P dV is applicable to infinitesimal changes occurring in a/an

(A) Open system of constant composition
(B) Closed system of constant composition
(C) Open system with changes in composition
(D) Closed system with changes in composition

9. The third law of thermodynamics deals with
(A) Chemical reactions
(B) Quantitative equivalence between heat and work
(C) Rate of change of a process
(D) Absolute entropy of perfect crystalline substances

10. The two specific heats at constant pressure and at a constant volume are equal at
(A) 0^o C (B) 0 K (C) 0^o F (D) 0^o R

11. For a reversible adiabatic change, the change in entropy of a system is
(A) Zero (B) Positive (C) Negative (D) Cannot be determined

12. The minimum number of degree of freedom of any system is
(A) 0 (B) 1 C) 2 (D) 3

13. In Vander Wall's equation P = $\frac{RT}{V-b}$ - $\frac{a}{V^2}$, the constants a and b are
(A) Positive (B) Negative
(C) Zero (D) One positive, one negative

14. Fugacity has the same dimensions as that of
(A) Gibbs free energy (B) Pressure
(C) Temperature (D) Fugacity is dimensionless

15. Melting of ice is an example of
(A) Isothermal process (B) Adiabatic process
(C) Isometric process (D) Isochoric process

16. The chemical potential of a pure substance depends upon
(A) Temperature (B) Pressure
(C) Both (a) and (b) (D) Neither (A) nor (B)

17. Drag co-efficient C_D in Stoke's law range is given by
(A) $C_D = \frac{16}{R_{e,p}}$ (B) $C_D = \frac{24}{R_{e,p}}$
(C) $C_D = \frac{18.4}{R_{e,p}}$ (D) $C_D = \frac{0.079}{R^{0.25}_{e,p}}$

18. In a fluidized bed reactor
(A) Temperature gradients are very high
(B) Temperature is more or less uniform
(C) Hot spots are formed
(D) Cold spots are formed

19. Power number is the ratio of
(A) Drag stress to inertial stress
(B) Inertial stress to drag stress
(C) Inertial stress to gravitational stress
(D) Gravitational stress to drag stress

20. Foot valves are provided in the suction line of a centrifugal pump to
(A) Avoid priming, every time we start the pump
(B) Remove the contaminants present in the liquid
(C) Minimize the fluctuation in discharge
(D) Control the liquid discharge

21. The schedule number of a pipe is an indication of its
(A) Size (B) Roughness
(C) Material density (D) Wall thickness

22. For turbulent flow of an incompressible fluid through a pipe, the flow rate Q is proportional to $(\Delta P)^n$, where ΔP is the pressure drop. The value of exponent 'n' is
(A) 1 (B) 0 (C) <1 (D) >1

23. A sand mixture was screened through a standard 10 – mesh screen. The mass fraction of the oversize material in feed, overflow and underflow were found to be 0.38, 0.79 and 0.22 respectively. The overall screen effectiveness is
(A) 0.90 (B) 0.58 (C) 0.53 (D) 0.83

24. The critical speed of the ball mill depends upon
(A) The radii of the mill and the ball
(B) The number of balls used
(C) The radius and number of balls
(D) The ratio of the mill and the ball, and the number of balls used

25. The angle of internal friction for free flowing granular material is
(A) 0^o (B) 90^o
(C) Between 15 and 30^o (D) Between 45 and 60^o

26. A hammer mill is used for
(A) Crushing (B) Grinding (C) Ultra grinding (D) Cutting

27. For crushing of solids, the Rittinger's law states that the work required for crushing is proportional to
(A) The new surface created (B) The size reduction ratio
(C) The change in volume due to crushing (D) Both (A) and (B)

28. The work index in Bond's law for crushing of solids has the following dimension:
(A) No units (dimensionless) (B) kWh / ton

(C) kW / ton (D) $kWhm^{1/2}$/ton

29. A solid sphere and a hollow sphere of same material and size are heated to the same temperature and allowed to cool in the same surroundings. If the temperature difference between the body and that of surroundings is T, then
(A) Both spheres will cool at the same rate for small values of T
(B) Both spheres will cool at the same rate for all values of T
(C) Hollow sphere will cool at a faster rate for all values of T
(D) Solid sphere will cool at a faster rate for all values of T

30. A furnace is made of a red brick wall of thickness 0.5 m and conductivity 0.7 W/mk. For the same heat loss and temperature drop, this can be replaced by a layer of diatomite earth of conductivity 0.14 W/mk and thickness
(A) 0.5 m (B) 0.1 m (C) 0.2 m (D) 0.6 m

31. A thin flat plate 2 m x 2 m is hanging freely in air. The temperature of the surrounding is 25^oC. Solar radiation is falling on one side of three plate at the rate of 500 W/m^2. Temperature of the plate will remain constant at 30^o C, if the convective heat transfer coefficient (in $W/m^2\ ^oC$) is
(A) 25 (B) 50 (C) 100 (D) 200

32. Heat transfer takes place according to
(A) Zeroth law of thermodynamics (B) First law of thermodynamics
(C) Second law of thermodynamics (D) Third law of thermodynamics

33. A perfect black body
(A) Is black in color (B) Reflects all incident radiation
(C) Absorbs all incident radiation (D) Transmits all incident radiation

34. Baffles are provided in heat exchangers to
(A) Increase pressure drop (B) Decrease pressure drop
(C) Increase rate of heat transfer (D) Decrease vibrations

35. H_2S present in naphtha reformed gas is removes by absorbing with
(A) Ethanolamine (B) K_2CO_3
(C) HCl (D) Vacuum gas oil

36. HETP is numerically equal to HTU, only when the operating line
(A) Lies below the equilibrium line (B) Lies above the equilibrium line
(C) And equilibrium lines are parallel (D) Is far from the equilibrium line

37. Milk is dried usually in a _____ dryer.
(A) Freeze (B) Spray (C) Tray (D) Rotary

38. Cox chart is useful in the design of
(A) Distillation column (B) Evaporator

(C) Dryer (D) Crystallizer

39. The absorption factor is defined as

(A) $\frac{L}{mG}$ (B) $\frac{G}{mL}$

(C) $\frac{mL}{G}$ (D) $\frac{LG}{m}$

where L = liquid flow rate, G = gas flow rate and m = slope of the equilibrium line

40. Mass transfer coefficient (K) according to penetration theory varies with mass diffusivity as

(A) $D^{0.5}$ (B) D (C) 1/D (D) $D^{1.5}$

41. The rate constant of a reaction depends upon

(A) Time (B) Temperature (C) Weight (D) Mass

42. For the chemical reaction A $\longrightarrow$ B, it is found that the rate of the reaction increases by a factor of 8 when the concentration of A is doubled. If rate α C_A^n then n for this reaction must be

(A) 2 (B) 1/3 (C) 3 (D) 4

43. A batch reactor is characterized by

(A) Constant resident time
(B) The variation in extent of reaction and properties of the reaction mixture with time
(C) Variation in reactor volume
(D) Very low conversion

44. For perfect mixed flow the dispersion number must be

(A) Zero (B) <2100 (C) <2 (D) Infinity

45. For a liquid in plug flow, the eddy diffusivity must be

(A) Zero (B) Infinity
(C) 1 (D) Between 0 and infinity

46. For identical feed composition and flow rate, N plug flow reactors in series with the total volume V, gives the same conversion as a single

(A) Plug flow reactor of volume V (B) CSTR of volume V
(C) Plug flow reactor of volume V/N (D) Plug flow reactor of volume VN

47. For a unit – step change in input, the output of a pure capacitive process

(A) Increases linearly with time in an unbounded fashion
(B) Increases exponentially with time in an unbounded fashion
(C) Decreases linearly with time
(D) Decreases exponentially with time

48. The response of two non interacting tanks of same size and resistance in series is

(A) Under damped (B) Critically damped
(C) Over damped (D) Undamped

49. The gain margin and phase margin of an open loop response can be computed from
(A) A Ziegler-Nichols plot (B) A Nyquist plot only
(C) Bode plots only (D) Nyquist plot as well as Bode plots

50. For the same domain function f(t) = e^{-t} , the Laplace transform of $\int_0^t f(t)dt$ is equal to
(A) $\frac{s}{s+1}$ (B) $\frac{1}{s(s+1)}$ (C) $\frac{1}{s(s+1)} - 1$ (D) $\frac{1}{s+1}$

51. An inclined tube manometer is _____ sensitive than U tube manometer.
(A) More (B) Less (C) Equal (D) Equal or less

52. Ratio control is used to control the ratio of flow rates of two streams. It is a special type of
(A) Feedforward control (B) Feedback control
(C) Inferential control (D) Cascade

53. Which of the following is the most common type of baffle used in industrial shell and tube heat exchanger?
(A) 75% cut segmental baffle (B) 25% cut segmental baffle
(C) Orifice baffle (D) Disc and doughnut baffle

54. In condenser, the cooling water is passed in the tube side in a pass arrangement because
(A) It reduces heat transfer area (B) More thinner tubes can be used
(C) Pressure drop is reduced (D) It makes condenser compact

55. The approximate liquid depth in a agitation tank is equal to
(A) 0.5 d (B) 0.75 d (C) d (D) 2 d
where d = tank diameter

56. Safety valves are provided in chemical equipments to guard against excessive
(A) Temperature (B) Pressure/pressure fluctuation
(C) Turbulence (D) Noise

57. Profit is equal to revenue minus
(A) Book value (B) Total cost
(C) Operating cost (D) Salvage value

58. Utilities cost in the operation of chemical process plant comes under the
(A) Plant overhead cost (B) Fixed charges
(C) Direct production cost (D) General expenses

59. Producer gas consists mainly of
(A) CO, CO_2, N_2, H_2 (B) CO, H_2
(C) H_2, CH_4 (D) C_2H_2, CO_2, H_2

60. Rancidity of the fatty oil can be reduced by its

(A) Decoloration (B) Hydrogenation (C) Oxidation (D) Purification

61. Varnish does not contain
(A) Pigment (B) Thinner
(C) Dryer (D) Anti-skimming agent

62. The ideal pulp for the manufacture of paper should have high _____ content.
(A) Cellulose (B) Lignin
(C) Both (A) and (B) (D) Pitch

63. Which of the following coals has the highest calorific value?
(A) Lignite (B) Sub-bituminous
(C) Anthracite (D) Peat

64. DDT stands for
(A) Diethyl-diphenyl-trichloromethane (B) Dichloro-diphenyl-trichloromethane
(C) Diphenyl-dichloro-trichloromethane (D) Dichloro-diphenyl-trichloroethane

65. Nylon 6-6 is manufactured from
(A) Hexamethylenediamine and adipic acid
(B) Hexamethylenediamine and maleic anhydride
(C) Caprolactum
(D) Dimethylteriphthalate and ethylene glycol

66. Alum is commercially produced from
(A) Gypsum (B) Feldspar (C) Galena (D) Bauxite

67. Fourdrinier machine is used in the manufacture of
(A) Sugar (B) Paper
(C) Alcohol from molasses (D) Phenol formaldehyde

68. Which of the following sugars is the sweetest?
(A) Glucose (B) Fructose (C) Sucrose (D) Lactose

69. Feed for reforming is generally
(A) Naphtha or straight run gasoline (B) Reduced crude
(C) Vacuum gas oil (D) Atmospheric gas oil

70. The most important property for a jet fuel is its
(A) Viscosity (B) Freezing point
(C) Calorific value (D) Flash point

71. Operating principle of cyclone separator is based on the action of _____ dust particles.
(A) Diffusion of (B) Centrifugal force on
(C) Gravitational force on (D) Electrostatic force on

72. Which of the following dust collection equipments is the least efficient (for sub-micron particles)

(A) Dust catcher (gravity type) (B) Cyclone separator
(C) Bag filter (D) Hollow wet scrubber

73. Which of the following is the most efficient for removal of very finely divided suspended solids and colloidal matter from the polluted water stream?

(A) Sedimentation tank (B) Circular clarifier
(C) Mechanical flocculation (D) Chemical coagulation

74. The killer gas which caused Bhopal gas tragedy in 1984 was

(A) Phosgene (B) Methyl isocyanate
(C) Carbon monoxide (D) Sulphur dioxide

75. World's worst radioactive pollution was caused by nuclear reactor disaster which occurred in

(A) Arizona (USA) (B) Chernobyl (undivided USSR)
(C) Pennsylvania (USA) (D) Moscow, USSR

x-x-x

M.E. (Food Technology)

1. Ergot fungus do not attack on ----------
A) Fish B) Wheat C) Rye D) Oat

2. The major producer of oat in the world is
A) Canada B) America
C) Russian Federation D) European federation

3. Among the cereal varieties which can be cultivated at sub zero temperature is
A) Rice B) Rye C) Barley D) Oat

4. Most of the world corn (Maize) is grown in which country of the world
A) USA B) India C) China D) Brazil

5. Cereals grown in deep water conditions include
A) Maize B) Rice C) Rye & oats D) Millets

6. The hard bread making wheat is
A) Diploid B) Tetraploid C) Hexaploid D) Monoploid

7. Plant hormone used to trigger the germination of seeds is
A) Gibberellins B) Auxins C) Oxytocin D) Sterol

8. The botanical name of Rice is
A) *Triticum aestivum* B) *Fago Pyrum esculantum*
C) *Durum compactum* D) *Oryza sativa*

9. The soluble protein which act as storage protein in rice and burley is
A) Albumin B) Globulin C) Prolamines D) Glutenlin

10. The main storage protein of burley is
A) Prolamines and glutelins B) Prolamines and globulins
C) Glutelin and gliadin D) Glutelin and globulins

11. The LMTD for counter current flow in a heat exchanger where one stream rises from 28˚ to 75˚C where as other flow fall from 95˚ to 85˚C.
A) 65.2˚ C B) 13.7˚ C C) 38.5˚ C D) 27.9˚ C

12. Protein content of oats is
A) 9-10% B) 5% C) 15% D) 7-8%

13. The chemical composition of sorghum grain is similar to that of
A) Rye B) Oat C) Barley D) Corn

14. The saccharifying enzyme is
A) α-amylase B) β- amylase C) Pectinase D) Cellulase

15. The liquefying enzyme is
A) Maltase B) β- amylase C) Pectinase D) α-amylase

16. The number of proteins present amino acid present in the biological system are
A) 18 B) 20 C) 20 D) 25

17. Caramalization takes place due to

A) Burning of sugar
B) Burning of starch
C) Enzymatic browning
D) Burning of proteins

18. The sugar associated with hemicelluloses include (s)
A) D-Xylose B) D-Galactose C) D-Glucose D) D-Fructose

19. Bulging of can due to
A) H_2 gas production
B) Expansion of food product
C) N_2 production
D) O_2 gas production

20. Crude fibre mainly includes
A) Glucose and cellulose
B) Cellulose and hemicelluloses
C) Lignin and pectin
D) Fructose and Glucose

21. Cell wall is important due to their
A) Source of enzyme
B) Source of glucose
C) Source of mineral
D) Structural frame work and source of energy

22. The expansion of term HACCP and GRAS are
A) Hygienic Associated Critical Control Point; Grossly Recommended As Safe
B) Hazard Analysis and Critical Control Point; Generally Recognized As Safe
C) Hygienic and Aesthetic Concept of Critical Products; Generally Recognized As Safe
D) Hazard Analysis and Critical Control Point; Grossly Recommended As Safe

23. Match the food items in Group I with the type of colloidal dispersion given in Group II.

Group I	Group II
P) Mayonnaise	1) Sol
Q) Tomato ketchup	2) Emulsion
R) Cake	3) Gel
S) Curd	4) Solid foam

A) P-4, Q-1, R-2, S-3
B) P-3, Q-1, R-2, S-4
C) P-2, Q-3, R-4, S-1
D) P-2, Q-1, R-4, S-3

24. One ton of Apple at 35C is to be cooled at 4C in 8 h. The radiation and other losses are estimated to be 10 percent of the refrigeration load. Efficiency of the motor is 85 percent. Specific heat of Apple is equal to that of water. Tonnage of Refrigeration and Horse power of the motor is
A) 0.345 kW, 7.8 hp
B) 0.234 kW, 3.4 hp
C) 0.745 kW, 7.8 hp
D) 0.745 kW, 3.4 hp

25. Polysaccharides are the carbohydrates having number of monomer unit ranging from
A)>5 B)>10 C) >20 D) >50

26. The calorific value of alcohol is
A) 5.9 Kcal/g
B) 8.97 Kcal/g

C) 7 Kcal/g D) 9 Kcal/g

27. F value at 121˚ C equivalent to 99.999% inactivation of a strain of *C. botullinum* is 1.2 min. D0 value of this organism is
A) 0.43 min B) 0.24 min C) 0.65 min D) 0.12 min

28. Micelle in solvent extraction of oil from oil seed flakes consists of
A) Oil and water B) Oil, water and solvent
C) Water and solvent D) Oil and solvent

29. The extracted meal in solvent extraction of oil seed is desolventized by
A) Air drying B) Live steam heating
C) Vacuum sacking D) Roasting

30. Oil bearing material is cooked prior to oil extraction because cooking
A) Coagulates protein and make oil droplets bigger in size
B) Frees protein
C) Increase emulsifier content
D) Reduce soap recovery

31. Toxin gossypol is present in which oil bearing seeds
A) Coconut B) Cotton seed C) Sunflower D) Caster seed

32. Moisture content of papaya is 85% wet basis. In dry basis the value will be
A) 333% B) 155% C) 566.6% D) 444%

33. Optimum combination of pulses and cereals for human diet is
A) 1:3 B) 1:4 C) 1:5 D) 1:6

34. Essential fatty acid requirement of a man is
A) 1-3% of energy intake B) 3-6% of energy intake
C) 6-9% of energy intake D) 9-11% of energy intake

35. Which vitamin is found to be retained (present) in rice after parboiling?
A) Vit A B) Vit D C) Vit E D) Thiamine

36. The glucose units in cellulose are linked together by
A) α-1-4 glycosidic linkage B) β-1-4 glycosidic linkage
C) α-1-6 glycosidic linkage D) β-1-6 glycosidic linkage

37. Drying of foods in very hot and dry air causes
A) Excessive drying B) Case hardening
C) Enzymatic browning D) Microbial contamination

38. The gaseous fumigant used for the granaries include
A) Methyl bromide B) Phosphine
C) Both A & B D) Tetrachloroethane

39. The factor 6.25 used commonly in calculating protein content in Kjeldahl's method is based on
A) Ammonia content of raw proteins B) Amino acid content of raw proteins
C) Nitrogen content of proteins D) Molecular weight of protein fraction

40. The viscosity of aqueous solution containing starch increases upon heating due to
A) Starch gelatinization B) Starch retrogradation
C) Forming of starch complex D) Starch solubilisation

41. Complete solubilisation of starch in excess of water do not occur unless the temperature in excess of water as high as
A) 100˚C B) 120˚C C) 90˚C D) 110˚C

42. Brown color of baked potato is due to
A) Polymerization of Carotenoids B) Maillard reactions
C) Caramallization D) Enzymatic browning

43. Rheological nature of wheat dough is
A) Viscous B) Elastic C) Viscoelastic D) Rheopectic

44. In chemically modified starches, the abbreviation 'DS' is termed as
A) Digestibility standard B) Degree of substitution
C) Degree of solubility D) Dissolve starch

45. In cross-linked starches, the gelatinization temperature gets
A) Decrease B) Increase C) Remain unchanged D) Remain constant

46. For food application, the maximum value for the degree of substitution (DS) of starches should be between
A) 0.2- 0.5 B) 0.5 – 1.0 C) 0.05 – 1.0 D) 0.01-0.1

47. Upon starch modification such as cross linking, the starch stability gets
A) Increases B) Decreases
C) Remains unchanged D) Remains constant

48. Aerated candy is
A) Chocolate B) Hard boiled candy
C) Lollypop D) Cotton candy

49. In the substituted starches, the swelling power and solubility of cereal starches gets
A) Increases B) Decreases
C) Remains unchanged D) Remains constant

50. In substituted starches gelatinization temperature gets
A) Increases B) Decreases
C) Remains unchanged D) Remains constant

51. -------- enzyme is used for tenderization of meat.
A) Papain B) Bromelain C) Pectinase D) Both A) and B)

52. 100 kWh is equal to
A) 7.2×10^8 J B) 3.6×10^8 J C) 8.3×10^8 J D) 6.5×10^8 J

53. ---------- % of fat is present in butter
A) 20% B) 35% C) 88% D) 80%

54. --------- type of membrane is used in ultra-filtration.
A) Cellulose acetate B) Nanofiber

C) Tissue paper D) Whatman filter paper

55. ---------- packaging technology is used to pack fresh meat.
A) Aseptic B) Vacuum
C) Oxygen Scavenging D) Retort

56. Sealed tube containing equal number of spores of an isolate from a spoiled canned food were heated for 10 and 15 min at 115.5˚C. The survivors were, respectively 4600 and 160. The lag time for heating the tubes to 115.5˚C was established in prior experiments to be 0.5 min. D value is
A) 3.42min B) 1.23min C) 7.89 min D) 4.56 min

57. About how much oil is left by the traditional ghanies in the oil seed cake
A) 5 to 7% B) 7 to 10% C) 10 to 15% D) 0 to 5%

58. Sterilization value of a process has been calculated to be an F_0 of 2.88. If each can contains 10 spores of an organism having a D_0 of 1.5 min. assuming that the F_0 value was calculated using the same z value as the organism. The probability of spoilage ($P_{spoilage}$) from this organism is
A) 0.45 B) 0.32 C) 0.12 D) 0.06

59. ---------- pigment is present in meat.
A) Anthocyanin B) Betanin C) Myoglobin D) Chlorophyll

60. A microbial kill of 99.99% is equivalent to
A) 2 log cycle B) 4 log cycle C) 6 log cycle D) 3 log cycle

61. In burley and oat, the cell wall of starchy endosperm is made up of
A) β-D- glucans B) Cellulose C) Arabinoxylan D) Pectin

62. Antinutritional factors present in the legume is
A) Trypsin inhibitors B) Lysine inhibitors
C) Methionine inhibitors D) Phenylalanine inhibitor

63. Lemon juice is passing through an SS pipe of 1" diameter, schedule 40. The specific gravity of lemon juice is 1.05 and its viscosity is 2.5 cp. The volumetric flow rate of the juice is 60 lpm. The Reynolds number is
A) 2004 B) 40000 C) 10000 D) 20400

64. One ton of refrigeration means
A) Cooling provided by one kg of ice in one hour
B) Cooling provided by one ton of ice in one hour
C) Energy extracted to freeze one ton of water in one day
D) Coefficient of performance is unity

65. The ratio of total mass transferred to mass transferred due to molecular diffusion is called as
A) Grashof number B) Schmidst number
C) Sherwood number D) Reynolds number

66. The ratio of molecular diffusion of momentum to molecular diffusion of mass is called
A) Biot number B) Schmidst number
C) Grashof number D) Sherwood number

67. ------- law describe molecular diffusion.
A) Kick law B) Power Law C) Fick's law D) Henry's law

68. Choose the target organism for milk pasteurization from the following
A) *Mycobacterium tuberculosis* B) *Coxiella burnetii*
C) *Clostridium botulinum* D) *Bacillus cereus*

69. Oleic acid is
A) Unsaturated fatty acid B) C-18 fatty acid
C) Present in oil D) C-18 unsaturated fatty acid

70. Oxidative rancidity follows
A) Endothermic reaction B) Exothermic reaction
C) Addition reaction D) Free radical mechanism

71. C_{12} fatty acid is
A) Stearic acid B) Palmitic acid
C) Lauric acid D) Oleic acid

72. Solvent extraction of oil follows
A) Diffusion process B) Leaching
C) Centrifugation D) Osmosis.

73. Which one is not a food packaging material
A) Polyethylene B) Polypropylene
C) Bi-axially oriented Polypropylene D) Acetylene.

74. 'Yield stress' term is related with
A) Leaching B) Distillation C) Rheology D) Extraction

75. Match the toxicants of plant foods in Group I with their main plant source given in Group II.

Group I	Group II
P. Gossypol	1. Khesari Dahl (Lathyrus sativus)
Q. Vicine	2. Cotton seeds
R. Glucosinolates	3. Fava beans
S. BOAA (beta-N- Oxalyl Amino L-Alanine)	4. Rapeseeds

A) P-2, Q-3, R-4, S-1 B) P-2, Q-4, R-3, S-1
C) P-3, Q-1, R-2, S-4 D) P-4, Q-3, R-1, S-2

x-x-x

MSc(HS)(Biophysics)

1. An angle whose value is ____, is called complete angle.
(A) 180^o (B) 240^o (C) 360^o (D) 85^o

2. The areas of two similar triangles are 81 sq. cm and 49 sq. cm. Find the ratio of their corresponding heights.
(A) 9:7 (B) 7:9 (C) 6:5 (D) 81:49

3. Consider ΔABD such that angle ADB = 20° and C is a point on BD such that AB=AC and CD=CA. Then the measure of angle ABC is
(A) 30° (B) 40° (C) 45° (D) 60°

4. A, B and C can complete a piece of work in 14, 6 and 12 days respectively. Working together, they will complete the work in
(A) 19/9 days (B) 27 days (C) 28/9 days (D) 25/8 days

5. The half life period of a first order reaction is 60 minutes. What percentage will be left over after 240 minutes?
(A) 6.25% (B) 4.25% (C) 5% (D) 6%

6. Which of the following is not a colligative property?
(A) Osmotic pressure (B) Optical activity
(C) Depression in freezing point (D) Elevation in boiling point

7. The amount of current in faraday is required for the reduction of 1 mol of $Cr_2O_7^{--}$ ions into Cr^{3+} is
(A) 1F (B) 2F (C) 6F (D) 4F

8. For a chemical reaction,
$mA \longrightarrow xB$, the rate law is $r=k[A]^2$
if the concentration of A is doubled, then the reaction rate will be
(A) Doubled (B) Quadrupled
(C) Increases by eight times (D) Unchanged

9. Schottky defect in a crystal is observed when,
(A)Unequal number of cations and anions are mission from the lattice
(B) Equal number of cations and anions are missing from the lattice
(C) An ion leaves its normal site and occupies an interstitial site
(D) No ion is missing from its lattice site

10. Replacement of Cl of chlorobenzene to give phenol requires drastic conditions, but Cl of 2,4 dinitro chlorobenzene is readily replaced. This is because,

(A) -NO_2 group makes the ring electron rich at ortho and para positions
(B) -NO_2 group withdraws electrons from meta position
(C) -NO_2 donates electrons at meta position
(D) -NO_2 withdraws electron from ortho and para positions

11. The number of oxygen atoms in 4.4gm of CO_2 is,
(A) $1.2x10^{23}$ (B) $6x10^{22}$ (C) $6x10^{23}$ (D) $12x10^{23}$

12. The correct statement regarding entropy is
(A) At absolute zero temperature, entropy of a perfectly crystalline solid is zero
(B) At absolute zero temperature, entropy of a perfectly crystalline substance is positive
(C) At absolute zero temperature, entropy of all crystalline solid is zero
(D) At 0^oC, the entropy of a perfectly crystalline solid is zero

13. "Tuberculosis" is caused by
(A) Bacterium (B) Virus (C) Protozoan (D) Malnutrition

14. The area of science that seeks to catalog and analyze every protein in the human body in order to help understand the human genome is called:
(A) Bioinformatics (B) Molecular genetics
(C) Proteomics (D) Genomics

15. β-radioactivity in a biological sample can be quantified by
(A) Liquid scintillation counting
(B) High-performance liquid chromatography (HPLC)
(C) Mass spectroscopy
(D) Colorimetry

16. 1 curie radioactivity is equal to
(A) 3.7×10^{10} dps (B) 3.7×10^{6} dps (C) 3.7×10^{1} dps (D) 3.7×10^{3} dps

17. In Electron microscope, light source is replaced by a beam of very fast moving
(A) Electron (B) Proton (C) Neutron (D) Photon

18. When no kinetic energy is lost, collision is said to be
(A) Inelastic (B) Perfectly elastic (C) Elastic (D) Both A and B

19. Platelets are formed from which type of cell?
(A) Melanocytes (B) Macrophages (C) Astrocytes (D) Megakaryocytes

20. A man grows into a giant such that his linear dimensions increase by a factor of 9. Assuming that his density remains same, the stress in the leg will change by a factor of:
(A) 9 (B) 1/9 (C) 81 (D) 1/81

21. A copper ball of mass 100 gm is at a temperature T. It is dropped in a copper calorimeter of mass 100 gm, filled with 170 gm of water at room temperature. Subsequently, the temperature of the system is found to be 75°C. T is given by: (Given: room temperature=30°C, specific heat of copper=0.1 cal/gm°C)

(A) 800°C (B) 885°C (C) 1250°C (D) 825°C

22. Cp and Cv are specific heats at constant pressure and constant volume respectively. It is observed that

Cp−Cv=a for hydrogen gas

Cp−Cv=b for nitrogen gas

The correct relation between a and b is:

(A) a=1/14*b (B) a=b (C) a=14b (D) a=28b

23. An observer is moving with half the speed of light towards a stationary microwave source emitting waves at frequency 10 GHz. What is the frequency of the microwave measured by the observer? (speed of light=3×10^8 ms^{-1})

(A) 10.1GHz (B) 12.1GHz (C) 17.3 GHz (D) 15.3GHz

24. A capacitance of 2 μF is required in an electrical circuit across a potential difference of 1.0 kV. A large number of 1 μF capacitors are available which can withstand a potential difference of not more than 300 V.

The minimum number of capacitors required to achieve this is:

(A) 2 (B) 16 (C) 24 (D) 32

25. When a current of 5 mA is passed through a galvanometer having a coil of resistance 15 Ω, it shows full scale deflection. The value of the resistance to be put in series with the galvanometer to convert it into a voltmeter of range 0−10 V is:

(A) 1.985×10^3 Ω (B) 2.045×10^3 Ω (C) 2.535×10^3 Ω (D) 4.005×10^3 Ω

26. In a common emitter amplifier circuit using an n-p-n transistor, the phase difference between the input and the output voltages will be:

(A) 45° (B) 90° (C) 135° (D) 180°

27. Which of the following statements is false?

(A) Wheatstone bridge is the most sensitive when all the four resistances are of the same order of magnitude.

(B) In a balanced wheat stone bridge if the cell and the galvanometer are exchanged, the null point is disturbed.

(C) A rheostat can be used as a potential divider.

(D) Kirchhoff's second law represents energy conservation.

28. What is the 94^{th} term of the following sequence?

1,1,2,2,2,2,3,3,3,3,3,3,4,4,4,4,4,4,4,4,….

(A) 8 (B) 9 (C) 10 (D) 11

29. Which of the following numbers is a perfect square?

(A) 1022121 (B) 2042122 (C) 3063126 (D) 4083128

30. The equations m^2-33n+1=0, where m and n are integers, has
(A) No solution (B) Exactly one solutions
(C) Exactly two solutions (D) Infinitely many solutions

31. The sum of the first n natural numbers with one of them missed is 42. What is the number that was missed?
(A) 1 (B) 2 (C) 3 (D) 4

32. In a polysaccharide, number of monosaccharide are linked by
(A) Glycosidic bond (B) Peptide bond
(C) Hydrogen bond (D) Phosphoester bond

33. The Golgi Complex
(A) Synthesizes proteins
(B) Produces ATP
(C) Provides a pathway for transporting chemicals
(D) Forms glycoproteins

34. A person who has allergy, the type of antibody produced in his body is
(A) IgE (B) IgA (C) IgM (D) IgG

35. Patch clamp technique is used for
(A) Measuring action potential (B) Protein expression
(C) Single ion channel activity (D) DNA degradation

36. For the translocation of mRNA and tRNA within the ribosome
(A) ATP is required (B) AMP is required
(C) ADP is required (D) GTP is required

37. For a triclinic lattice type, the crystal parameters are
(A) a=b=c, α=β=γ=90° (B) a≠b=c, α≠β=γ=90°
(C) a≠b≠c, α≠β≠γ≠90° (D) a≠b≠c, α=β=γ=90°

38. Kupffer cells are found in which organ?
(A) Kidney (B) Lungs (C) Liver (D) Heart

39. Unstained living cells can be visualized by which microscopy?
(A) SEM (B) Confocal microscopy
(C) Flourescent Microscopy (D) Phase contrast microscopy

40. In prokaryotic cells the ribosome binds to the 5' end of the mRNA at a sequence known as a ribosome binding site which is also called as
(A) TATA box (B) CAT box
(C) Pribnow box (D) Shine–Dalgarno sequence

41. Electromagnetic radiation used to sterilize milk is

(A) Radiowaves (B) UV rays (C) Gamma - ray (D) X - ray

42. Which colour of the light has the longest wavelength?
(A) Red (B) Blue (C) Green (D) Violet

43. Increase in temperature of a gas filled in a container would lead to :
(A) Increase in its mass
(B) Increase in its kinetic energy
(C) Decrease in its pressure
(D) Decrease in intermolecular distance

44. Which of the following acts as a circuit protecting device?
(A) Conductor (B) Inductor (C) Switch (D) Fuse

45. α-particle consists of:
(A) 2 protons and 2 neutrons only
(B) 2 electrons, 2 protons and 2 neutrons
(C) 2 electrons and 4 protons only
(D) 2 protons only

46. Which part of the brain is responsible for thermoregulation?
(A) Cerebrum
(B) Hypothalamus
(C) Corpus callosum
(D) Medulla oblongata

47. Ozone hole refers to
(A) Hole in ozone layer
(B) Decrease in the ozone layer in troposphere
(C) Decrease in thickness of ozone layer in stratosphere
(D) Increase in the thickness of ozone layer in troposphere

48. How does steroid hormone influence the cellular activities?
(A) Changing the permeability of the cell membrane
(B) Binding to DNA and forming a gene hormone complex
(C) Activating cyclic AMP located on the cell membrane
(D) Using aquaporin channels as second Messenger

49. The correct sequence of phases of cell cycle is:
(A) M → G1 → G2 → S
(B) G1 → G2 → S → M
(C) S → G1 → G2 → M
(D) G1 → S → G2 → M

50. The ciliated epithelial cells are required to move particles or mucus in a specific direction. In humans, these cells are mainly present in
(A) Bile duct and Bronchioles
(B) Fallopian tubes and Pancreatic duct
(C) Eustachian tube and Salivary duct
(D) Bronchioles and Fallopian tubes

51. Which of the following statements is not correct?
(A) Lysosomes have numerous hydrolytic enzymes
(B) The hydrolytic enzymes of lysosomes are active under acidic pH

(C) Lysosomes are membrane bound structures
(D) Lysosomes are formed by the process of packaging in the endoplasmic reticulum

52. Which one of the following equipments is essentially required for growing microbes on a large scale, for industrial production of enzymes?
(A) BOD incubator (B) Sludge digester
(C) Industrial oven (D) Bioreactor

53. Which of the following pair of organelles does not contain DNA?
(A) Mitochondria and Lysosomes (B) Chloroplast and Vacuoles
(C) Lysosomes and Vacuoles (D) Nuclear envelope and Mitochondria

54. Which of the following facts will distinguish whether a cell is prokaryotic or eukaryotic?
(A) The presence or absence of a rigid cell wall
(B) The presence or absence of internal membranes partitioning the cells
(C) The presence or absence of Ribosomes
(D) The presence or absence of DNA as the Genetic material

55. Facultative absorption of water from primary urine is influenced by the hormone
(A) Vasopressin (B) Androgens (C) Thyroxine (D) Epinephrine

56. The immune system when work against self is called
(A) Self immune system (B) Autoimmunity
(C) Specific immunity (D) None of these

57. Movement of cell against concentration gradient is called
(A) Osmosis (B) Active transport
(C) Diffusion (D) Passive transport

58. Which of the following is not a fat soluble vitamin?
(A) Vitamin A (B) Vitamin D (C) Vitamin C (D) Vitamin E

59. Based on per molecule, which of the following gas has the most powerful greenhouse effect?
(A) CO_2 (B) CH_4 (C) N_2O (D) CFCs

60. DNA is associated with highly basic- proteins called—
(A) Histones (B) Non-Histones (C) Albumins (D) All of these

61. Which among the following is the simplest method to estimate the concentration of glycerol in an aqueous solution of glycerol?
(A) UV absorption spectroscopy (B) Gas chromatography
(C) pH measurement (D) Viscosity measurement

62. Insulin is secreted by _____
(A) Spleen (B) b-cells of pancreas

(C) a-cells of pancreas (D) Mucosa oesophagus

63. Serum is—
(A) Blood minus fibrinogen (B) Lymph minus corpuscles
(C) Lymph (D) Blood minus corpuscles and fibrinogen

64. The study related to the structure and function of cell is known as—
(A) Cytology (B) Histology
(C) Anatomy (D) Palynology

65. Origin of replication usually contains:
(A) GC rich sequences (B) Both AT and GC rich sequences
(C) No particular stretch of sequences (D) AT rich sequences

66. Thymine dimers are formed due to:
(A) High temp (B) UV radiations
(C) 5-bromouracil (D) Nitrous acid

67. During PAGE gel formation, acrylamide is activated by free radicals of:
(A) Ammonium persulfate (APS) (B) Tetramethylethylenediamine (TEMED)
(C) Sodium dodecyl sulfate (SDS) (D) Oxygen

68. Genbank is the database of :
(A) The European Molecular Biology Laboratory (EMBL)
(B) DNA Data Bank of Japan (DDBJ)
(C) SWISSPROT
(D) The National Center for Biotechnology Information (NCBI)

69. Which of the following is a sulphur containing amino acid?
(A) Glycine (B) Methionine (C) Threonine (D) Cytosine

70. Combination of purine pyrimidine base with pentose sugar is known as :
(A) Nucleotide (B) Nucleoside (C) Nucleic acid (D) Ribosome

71. In an alpha helical polypeptide, the back bone hydrogen bonds are between
(A) NH of n and CO of n + 4 amino acids (B) CO of n and NH of n + 3 amino acids
(C) CO of n and NH of n + 4 amino acids (D) NH of n and CO of n + 3 amino acids

72. Elongation during DNA synthesis begins from the :
(A) 5′end of a RNA primer (B) 5′end of the leading strand
(C) 3′end of DNA polymerase (D) 3′end of RNA primer

73. The most widely used scripting language in Bioinformatics is :
(A) Pascal (B) C (C) Oracle (D) Perl

74. The site of oxidation in a cell is the :
(A) Mitochondrion (B) Endoplasmic reticulum

(C) Golgi apparatus (D) Ribosomes

75. The structure of collagen is :

(A) Triple helix (B) Double helix

(C) Single helix (D) Beta stranded

x-x-x

M.E. Biotechnology

1. Which one of the following is the unit of heat transfer coefficient
   A. Wm^2K^{-1}
   B. $Wm^{-2}K$
   C. $Wm^{-2}K^{-1}$
   D. Wm^2K

2. The bacteria known to be naturally competent for transformation of DNA is
   A. *Escherichia Coli*
   B. *Bacillus Subtilis*
   C. *Mycobacterium tuberculosis*
   D. *Yersinia pestis*

3. Major stimulus for spore formation in bacteria is
   A. Nutrition limitation
   B. Heat stress
   C. Cold stress
   D. pH stress

4. Secondary sewage treatment involves
   A. Physical removal of solids from polluted water by filteration and sedimentation
   B. Removal of chemical remains by precipitation
   C. Removal of dissolved organic compounds by activated sludge or trickling filters
   D. Removal of microbial pathogens by chlorination or ozonation

5. The study of evolutionary relationships is known as
   A. Genomics
   B. Proteomics
   C. Phylogenetics
   D. Genetics

6. Thermal death of microorganisms in the liquid medium follows first order kinetics. If the initial cell concentration in the fermentation medium is 10^8 cells/ml and the final acceptable contamination level is 10^{-3} cells, for how long should 1 m^3 medium be treated at temperature of 120°C to achieve acceptable load. Thermal deactivation rate constant is 0.23/min
   A. 59 min
   B. 80 min
   C. 120 min
   D. 149 min

7. What amount of 11 N HCl is required to make 50 ml of 2 N HCl
   A. 2 ml
   B. 6.03 ml
   C. 9.09 ml

D. 11 ml

8. An enzyme that hydrolyses starch to maltose is
A. Alpha amylase
B. Beta amylase
C. Glucoamylase
D. Cyclodextrin glcanotransferase

9. How many fold would the g number of a centrifuge increase by doubling both the spinning speed and the bowl diameter
A. 2
B. 4
C. 8
D. 10

10. Which of the following is not a plant hormone
A. Corticosterone
B. Ethylene
C. Jasmonic acid
D. Abscisic acid

11. An equimolar mixture of species 1 and 2 is in equilibrium with its vapour at 300 K. At this temperature, the vapour pressures of the species are p_1^{sat} = 150 kPa and p_2^{sat} = 110 kPa. Assuming that Raoult's law is valid, the value of y_1 is
A. 0.33
B. 0.45
C. 0.50
D. 0.57

12. Bacteria used in biogas plant
A. Methanogens
B. Nitrifying bacteria
C. Denitrifying bacteria
D. Ammonifying bacteria

13. 12 moles of O_2 is added to 12 moles of H_2. How many moles of H_2O will it produce?
A. 6
B. 12
C. 18
D. 24

14. The dimensionless group in mass transfer that is equivalent to Prandlt number in heat transfer is

A. Nusselt number
B. Sherwood number
C. Schmidt number
D. Stanton number

15. Which amongst the following is not a polymer
A. Vinyl alcohol
B. Rubber
C. Polystyrene
D. Polyethylene

16. In an experimental population the birth rate is 16 per 1000 and death rate is 10 per 1000. If the size of the population is 10,000 at time, t, what will be the size of the population at time, t+1
A. 10,000
B. 10,060
C. 10,600
D. 11,600

17. Which part of a fermenter is used for thorough mixing of medium and inoculum
A. Sparger
B. Shaft
C. Headspace
D. Impeller

18. Flow cytometer is used to measure the number of
A. Cells
B. RNA
C. DNA
D. Proteins

19. What amongst the following does not affect the K_{La} value in fermentation vessel
A. Rheological properties of the medium
B. Presence of chelating agents
C. Air flow rate
D. Degree of agitation

20. Hydrolysis of a peptide involves cleavage of the bond between the atoms
A. N and C_α
B. C and O
C. C_α and C
D. N and C

21. An air lift fermenter uses _____ for mixing
A. Impeller
B. Air bubbles
C. Differential density

D. Sparger

22. Mass spectrometer separates ions on the basis of which of the following?
A. Mass
B. Mass to charge ratio
C. Molecular weight
D. Charge

23. Before freezing, the blanching of vegetables is done to
A. Denature enzymes
B. Maintain colour
C. Improve texture
D. Prevent microbial activity

24. Which property of polymeric sutures helps them keep the wound closed?
A. Low melting point
B. High thermoplasticity
C. High tensile strength
D. Low coefficient of friction

25. Lineweaver-Burk plot is a plot between
A. $\frac{1}{V_o} and \frac{1}{[S]}$
B. $V_o and [S]$
C. $V_o and \frac{1}{[S]}$
D. $\frac{1}{V_o} and [S]$

26. The ability of the immune system to recognize self antigens versus nonself antigen is an example of:
A. Specific immunity
B. Tolerance
C. Cell mediated immunity
D. Antigenic immunity

27. Nitrogenase reduces N_2 to NH_3. Metal co-factors required for this activity are _____
A. Fe & Cu
B. Mo & Fe
C. Mo & Mn
D. Cu & Mn

28. In gas chromatography, the separation of components is based on the difference in
A. Molarity
B. Molecular weight
C. Partition coefficient

D. Conductivity

29. Organic solvent used for yeast cell lysis

A. Toluene
B. Acetonitrile
C. Methanol
D. Dichloromethane

30. A Fab fragment

A. Is produced by pepsin treatment
B. Has no inter chain disulfide bond
C. Is produced by separation of heavy and light chains
D. Binds antigen

31. The process useful in harvesting microbial cells from fermentation broth is

A. Dialysis
B. Ultra filtration
C. Microfiltration
D. Reverse osmosis

32. For a chemical reaction the ratio of the rate constant at 600 K and 500 K is 3. The value of activation energy is

A. 10.5 kJ mol^{-1}
B. 12 kJ mol^{-1}
C. 20.2 kJ mol^{-1}
D. 27.4 kJ mol^{-1}

33. Teflon is used as coating on mechanical heart valves as it

A. Increases strength
B. Enhances rigidity
C. Lowers friction
D. Prevent wear resistance

34. The primary structure of proteins is maintained by

A. Peptide bonds
B. Hydrogen bonds
C. Ionic bonds
D. Disulphide bonds

35. Tear drops are rich in

A. Amylase
B. Lysozyme
C. Phosphates

D. Protease

36. In order to allow for bone ingrowth, the surface of the implants should be
A. Abrasive
B. Smooth
C. Porous
D. Adhesive

37. The antibody molecule is held together by _____ bonds
A. Sodium
B. Hydrogen
C. Amino acid
D. Disulfide

38. In a contnous ferementer if input supply is decreased, what would be effect on standing biomass and rate of production?
A. Standing biomass decrease and productivity increase
B. Standing biomass increase and productivity increase
C. Both decreases
D. Both increases

39. Gene mapping provides useful information about chance of
A. Inheritance of disorders
B. Inheritance of genes
C. Inheritance of recessive gene
D. Inheritance of dominant gene

40. Recombinant proteins are
A. Proteins synthesized in animals
B. Proteins synthesized by transgene in host cell by rDNA technology
C. Protein synthesized in cells that are produced by protoplast fusion
D. Proteins synthesised in mutated cell lines

41. What material coating helps the body to accept titanium implants?
A. Hydrogenated fat
B. Hydroxyapatite
C. Hydrangea
D. Hydrochloric acid

42. B and T cells are produced by stem cells that are formed in_____
A. Bone marrow
B. Liver
C. Spleen
D. lymph nodes

43. IgE:

A. Is abundant in saliva
B. Binds strongly to mast cells
C. Cannot bind to macrophages
D. Activates the complement cascade

44. Biofilm produced by bacteria is detected by
A. Saffranin
B. Malachite green
C. Basic fuchsin
D. Congo red

45. The dilution rate, D is defined as
A. Volumetric flow rate/ total volume of culture in the reactor
B. Total volume of culture in the reactor/ volumetric flow rate
C. Specific growth rate/ volumetric flow rate
D. Volumetric flow rate/ specific growth rate

46. A culture of *Rhizobium* is grown in a chemostat (100 m^3 bioreactor). The feed contains 12 gL^{-1} sucrose, K_s for the organism is 0.2 gL^{-1} and μ_m=0.3 h^{-1}. Flow rate required for steady state sucrose concentration of 1.5 gL^{-1} in the reactor will be
A. 2.6 m^3h^{-1}
B. 15 m^3 h^{-1}
C. 26 m^3 h^{-1}
D. 150 m^3 h^{-1}

47. Which device is used to measure the flow rate of a fluid
A. Orifice meter
B. Venture meter
C. Rotameter
D. Weir

48. Which of the following valves is used in an autoclave
A. Gate valve
B. Diaphragm valve
C. Safety valve
D. Globe valve

49. B cells that produce and release large amounts of antibody are called_____
A. Plasma cells
B. Memory cells
C. Basophils
D. Neutrophils

50. Purines in RNA are
- A. Adenine and Guanine
- B. Adenine and Thymine
- C. Adenine and Uracil
- D. Adenine and Cytosine

51. The complementary strand of 5'-ATCGAG-3' is
- A. 5'-TAGCTC-3'
- B. 5'-CTCGAT-3'
- C. 5'-ATCGAG-3'
- D. 5'-GAGCTA-3'

52. Carbohydrates binding proteins are called
- A. Lectins
- B. Alexins
- C. Polysacch-proteins
- D. Glycoproteins

53. Which of the following substances will not stimulate an immune response unless they are bound to a larger molecule?
- A. Antigen
- B. Hapten
- C. Antibody
- D. Virus

54. Wash out condition in seady state fermentation occurs when
- A. Cell concentration reaches maximum
- B. Substrate concentration is maximum
- C. Specific growth rate is maximum
- D. All of these

55. The homologue of β-catenin in *Drosophila* is
- A. Fushi Tarazu
- B. Engrailed
- C. Armadillo
- D. Cubitus Interruptus

56. How many overlapping trinucleotide units can be obtained for a DNA sequence of length 15 nucleotides
- A. 12
- B. 13
- C. 14
- D. 15

57. For moist heat sterilization, steam is used in the range of temperatures
- A. 100-120 °C

B. 121-140 °C
C. 141-160 °C
D. 161-180 °C

58. First developed database from protein sequences is
A. SWISS-PROT
B. TrEMBL
C. UniProt
D. PIR

59. *E.Coli* proliferates faster on GLUCOSE that it does on LACTOSE because lactose is
A. Taken up slowly as compared to glucose
B. Not hydrolyzed by *E.Coli*
C. Taken up faster as compared to glucose
D. Toxic to the cells

60. A chromosome aberration leads to change in the order of genes in a genetic map but does not alter its linkage group due to
A. Inversion
B. Transposition
C. Recombination
D. Translocation

61. What amongst the following is not favourable for protein folding?
A. Hydrophobic interaction
B. Hydrogen bonding
C. Van der Waals interaction
D. Conformational entropy

62. Mycobacterium Tuberculosis is an intra-cellular bacterium. It prefers to infect
A. B cells
B. T cells
C. Neutrophils
D. Macrophages

63. B lymphocytes develop immune competence in the
A. Thymus
B. Spleen
C. Lymph nodes
D. Bone marrow

64. The protein in eukaryotes subjected to degradation undergoes
A. Phosphorylation
B. Ubiquitation
C. Carboxylation
D. Methylation

65. In an exponentially growing batch culture of *Saccharomyces cerevisiae*, the cell density is 15 gL^{-1} (DCW), the specific growth rate(μ) is 0.2 $h^{-1}$and substrate uptake rate (ν) is 15 $gL^{-1}h^{-1}$. The cell yield coefficient $Y_{x/s}$ will be

A. 0.20
B. 0.35
C. 0.45
D. 0.50

66. The standard enthalpies of formation of H_2O (g) , CH_4 (g), CO_2 (g) are -241.8 kJ/mol, -74.52 kJ/mol, -393.5 kJ/mol respectively. Determine the heat of reaction for the following reaction

$$CH_4(g) + 2H_2O(g) \rightarrow CO_2(g) + 4\,H_2(g)$$

A. 164.62 kJ mol^{-1}
B. -77.18 kJ mol^{-1}
C. -164.62 kJ mol^{-1}
D. +77.18 kJ mol^{-1}

67. Which of the following is employed for the repeated use of enzymes in bioprocesses?

A. Polymerization
B. Ligation
C. Isomerisation
D. Immobilization

68. In a batch culture of *Penicillium chrysogenum*, maximum penicillin synthesis occurs during the

A. Exponential phase
B. Stationary phase
C. Lag phase
D. Death phase

69. The unit of reaction rate constant for a second order reaction is

A. $Conc^{-1}$ $time^{-1}$
B. $Time^{-1}$
C. Concentration $time^{-1}$
D. $Concentration^{-1}$

70. Under steady state conditions _____ is zero

A. Rate of disappearance of substrate
B. Rate of output of substrate
C. Rate of accumulation of substrate
D. All of these

71. The yield coefficient $Y_{\frac{X}{S}}$ *is defined as*

A. Grams of biomass produced per gram of substrate added
B. Grams of biomass produced per gram of substrate consumed

C. Rate of biomass production pe gram of substrate consumed
D. None of these

72. A continuous reactor has a dilution rate of 0.5 per hour. The hydraulic retention time would be
A. 0.5 h B. 1 h C. 1.5 h D. 2 h

73. At constant temperature and pressure, the molar density of a binary mixture is given by V = $1+x_2$, where x_2 is the mole fraction of component 2. The partial molar volume at infinite dilution for component 1, $\overline{V}_{1_\infty}$ is
A. 0.5 B. 1.0 C. 1.5 D. 2.0

74. The most effective method for air sterilization for the fermenter is
A. Heat
B. UV rays
C. Filtration
D. Chemical spray

75. The following is not a product of anaerobic digestion process
A. Antibiotics
B. Biogas
C. Hydrogen sulphide
D. Biofertilizer

x-x-x

M.Tech.(Material Science & Technology)

1. Which of the following is not an allotrope of carbon

A) Diamond B) Graphite
C) Dendrimer D) Carbon nanotube

2. Which of the following cubic cell has minimum packing fraction

A) Simple Cubic Cell B) Body Centre Cubic Cell
C) Face Centre Cubic Cell D) Hexagonal Cubic Cell

3. Residual resistivity in metals owes its origin due to

A) Zero point energy of free electron gas.
B) Presence of impurities/vacancies and defects in the metal crystal
C) Different modes of lattice vibration in metal crystals.
D) Minimum scattering of free electrons in metal crystals.

4. The pure semiconductor having highly –ve temperature coefficient of resistivity are

A) Thermistor B) Conductor C) Insulator D) Transistor

5. In the polycrystalline structures, the grain boundaries are not characterised by property that

A) Atomic packing is loose
B) Prone to diffusion and chemical activity
C) Form cleavage surfaces in the crystals
D) The mechanical strength is maximum

6. The number of four-fold rotation axes in a cubic unit cell are

A) 7 B) 9 C) 3 D) 5

7. Which of the following information about crystal is not yielded by X-ray diffraction studies:

A) Dimensions of unit cell of the crystal
B) Shape of the unit cell of the crystal
C) Symmetries observed by the crystal
D) Atoms or molecules or group of atoms occupying lattice positions

8. Silver has FCC structure. If inter-atomic separation between atoms 0.288nm then lattice constant is

A) 0.204nm B) 0.408nm C) 0.144nm D) 10nm

9. The spacing between the principal planes of a crystal is $0.2nm$. It is found that the first order Bragg reflection of a beam of monochromatic x-rays occurs at an angle of 30^{o}, then the wavelength of x-rays is:

A) 0.05nm B) 0.1nm C) 0.2nm D) 0.4nm

10. Which of these is not a ferroelectric material

A) Rochelle salt B) Potassium Diphosphate
C) $SrTiO_3$ D) Quartz.

11. Which of the following are temperature independent
A) Ferromagnetism B) Paramagnetism C) Ferrimagnetism D) Diamagnetism

12. Which is not true about effective mass of electron in a crystal:
A) It is positive within the allowed energy regions
B) It is zero at the topmost level of band
C) It is negative in the forbidden zone
D Always remains positive

13. Which of the following phenomena indicate the onset of superconductivity
A) Very high electric resistance and high thermal conductivity
B) Nearly zero electric resistance and perfect diamagnetic nature.
C) Very low specific heat and high bend gap energy.
D) Very high specific heat and low electric resistance.

14. Electric resistance of a metal owes its origin to
A) Lattice vibration of ions.
B) Scattering of conduction electrons.
C) Trapping of electrons in the vacant site of crystal
D) Recombination of free electrons with ions on regular sites in kernel.

15. At very high frequency of alteration of electric field applied on a dielectric medium, the insulating nature is observed only if
A) Electronic polarizability is non-vanishing.
B) Ionic polarizability vanishes.
C) All the three polarizabilities vanish.
D) Dipolar polarizability vanishes.

16. In the polycrystalline structures, the grain boundaries are not characterised by the property that
A) Atomic packing is loose.
B) Prone to diffusion and chemical activity.
C) Form cleavage surfaces in the crystals.
D) The mechanical strength is maximum.

17. Two consecutive planes having Millers indices (034) and lattice constants a=b=c=10nm are separated by distance of
A) 2.8nm B) 3.2nm C) 3nm D) 2nm

18. Which of the following is not an ionic defect
A) Frankel defect B) Schottky defect C) Color Centre D) Screw dislocation

19. The tensile strength of metals is much less than theoretically prediction because
A) Most of the metals have dislocations induced in them.
B) Most metals are extractable in pure form.
C) Point defects reduce the actual strength.
D) Point defects enhance mechanical strength.

20. The interference differs from diffraction
A) It can be observed with white light
B) Unlike diffraction, the interference fringes are of varying intensity
C) Interference minima are completely dark and that of diffraction are not
D) The diffraction fringes are of equal width

21. If the Fermi energy of silver at 0K is 5eV, the mean energy of electron in silver at 0K is
A) 5 eV B) 7.5 eV C) 12 eV D) 3 eV

22. The amplitude (E) of the light waves and the distance(x) from the source are related as
A) $E \propto x^{-2}$ B) $E \propto x^{-1}$ C) $E \propto x$ D) $E \propto x^{2}$

23. In metals which of the equation will hold good?
A) $\vec{\nabla} \times \vec{H} = \vec{J}$ B) $\vec{\nabla} \times \vec{H} = \vec{D}$ C) $\vec{\nabla} \times \vec{H} = \frac{\partial \vec{D}}{\partial t}$ D) $\vec{\nabla} \times \vec{J} = \frac{\partial \vec{D}}{\partial t}$

24. The wave function of a certain particle is $\Psi = A\, e^{i \propto x}$ for $0 < x < L$. The value of normalization constant A is
A) $\sqrt{\frac{2}{L}}$ B) $\sqrt{\frac{1}{L}}$ C) $\frac{2}{L}$ D) $\frac{1}{L}$

25. A pendulum of length L having supporting mass M swings back and forth with period T. If the mass is doubled, what is the new period?
A) T B) T/2 C) 2T D) $T\sqrt{2}$

26. The Lagrange's equations of motion for a system of particles is equivalent to _____ equations of motion
A) Laplace B) Poisson C) Newton's (D) Maxwell's

27. Two electric bulbs rated P_1 and P_2 watt at V volts are connected in series across V volt mains, then their total power consumption P is
A) P_1+P_2 B) $\sqrt{P_1P_2}$ C) $P_1P_2/(P_1+P_2)$ D) $(P_1+P_2)/P_1P_2$

28. A proton and an alpha particle enters in a uniform magnetic field with the same velocity. The period of rotation of the alpha particle will be
A) Four times that of proton B) Two times that of proton
C) Same as that of proton D) Less than that of proton

29. The mass equivalent to 931 MeV energy is
A) 1.66×10^{-27} kg B) 6.02×10^{-24} kg
C) 1.66×10^{-20} kg D) 6.02×10^{-27} kg

30. In which of the medium sound travels faster?

A) Gas B) Liquid C) Solid D) Water vapour

31. Rayleigh Jeans Law holds good for which of the following:

A) Shorter wavelength B) Longer wavelength

C) High temperature D) High energy

32. What is the lattice constant for FCC lattice having atomic radius 1.476 Å

A) 1.476 Å B) 5.216 Å C) 4.175 Å D) 3.408 Å

33. A superconducting material when placed in a magnetic field will

A) Attract the magnetic field towards its centre

B) Repel all the magnetic lines of forces passing through it

C) Attract the magnetic field but transfer it into a concentrated zone

D) Not influence the magnetic field

34. The decay constant of a radioactive sample is λ. The half life and the average life of the sample are respectively

A) $\frac{1}{\lambda}$ and $\frac{\ln 2}{\lambda}$ B) $\frac{\ln 2}{\lambda}$ and $\frac{1}{\lambda}$ C) $\frac{\lambda}{\ln 2}$ and $\frac{1}{\lambda}$ D) $\frac{1}{\lambda}$ and λ ln2

35. The time independent Schrodinger's equation of a system represents the conservation of

A) Total energy of the system B) Total potential energy of the system

C) Total Kinetic energy of the system D) Total binding energy of the system

36. For azimuthal quantum number $l = 2$, the total number of possible values of magnetic quantum number m_l is

A) 3 B) 5 C) 2 D) 1

37. The de-Broglie wavelength of an electron accelerated from rest on application of potential of 400 V is:

A) 0.165 Å B) 0.512 Å C) 0.613 Å D) 0.251 Å

38. Which of the following cannot be polarized?

A) Radio waves B) Sound waves C) X-rays D) UV rays

39. Identify the initiator used in anionic addition polymerization

A) BuLi B) BF_3

C) Ziegler Natta catalyst D) Benzoyl peroxide

40. Which is the correct order of energy required for various electronic transitions

A) n to Π* › σ to σ* › Π to Π* › n to σ* B) σ to σ* › n to σ* › Π to Π* › n to Π*

C) σ to σ* › Π to Π* › n to Π* › n to σ* D) n to σ* › Π to Π* › n to Π* › σ to σ*

41. For a solution of camphor in hexane in a 10 cm cell, the absorbance was found to be 2.52 at 295 nm with ε_{max} = 14. What will be the concentration of camphor

A) 0.0018 moles/lt B) 0.018 moles/lt
C) 1.8 moles/lt D) 0.18 moles/lt

42. The specific corrosive environment for stress corrosion of stainless steel is
A) Nitrate solution B) Ammonical solution
C) Alkali solution D) Water containing electrolytes

43. In acidic solution which of the following is not used to control corrosion
A) Amine B) Na_2SO_3 C) Marcaptans D) Antimony oxide

44. The attack of O_2 on Mo leads to formation of which type of layer
A) Non stable B) Stable C) Porous D) Volatile

45. Identify the non conducting polymer
A) Polyacetylene B) Polypyrrole C) Polythiophene D) Polyethylene

46. Identify the amorphous polymer
A) High density polyethylene B) Low density polyethylene
C) Nylon D) Polyester

47. Select one of the monomer for nylon 6,6 from the given choices
A) Sebacic acid B) Adipic acid C) Caprolactum D) ε-amino acid

48. The number of peaks observed in IR spectra of H_2O is
A) 3 B) 4 C) 2 D) 5

49. In which of the given solvents the value of λ of ethylene will be maximum
A) Water B) Chloroform C) Methyl alcohol D) Hexane

50. The value of CFSE for the complex $[TiCl_4]^{2-}$ is
A) -8 Dq B) -5.34 Dq C) -12 Dq D) 8.90 Dq

51. Which of the following is the catalyst for hydrogenation reaction of alkenes
A) K_2PdCl_4 B) $RhHCO(PPh_3)_3$ C) Zn-Cu Oxide D) $RhCl(PPh_3)_3$

52. Entropy change in an isobaric process is given by
A) $nC_p\ln T_2/T_1$ B) $-nR\ln P_2/P_1$ C) $nR\ln V_1/V_2$ D) $-nR\ln P_1/P_2$

53. Which of the following does not favour the formation of tetrahedral complex
A) Weak field ligand B) Bulky ligands
C) Low oxidation state of metal D) High oxidation state of metal

54. The entropy change accompanying the heating of one mole of helium (C_v = 3/2R) from a temperature of 100K to 300K at constant pressure is
A) 25.17 J/K mol B) -13.17 J/K mol
C) 22.83 J/K mol D) 13.17 J/K mol

55. The enthalpy change for combustion of one mole of sulfur dioxide in bomb calorimeter at 25 ^{o}C which releases 97.030 kJ of heat is

A) -97.030 kJ B) -98.14 kJ C) +98.14 kJ D) 97.030 kJ

56. Which of the following is not the property of a enzyme catalysis

A) Organic in nature
B) Operate by lock and key mechanism
C) Very specific in action
D) Their activity is independent of temperature

57. Select the one absorbing IR radiation at highest frequency

A) O-H B) O-D C) F-H D) F- D

58. The general solution of the ordinary differential equation $3x^2\, y\ dx + (y^4 - x^3)dy = 0$ is

A) $3\,x^3 + y^4 = cy$ B) $3\,x^3 + c\,y^4 = y$

C) $y = c\,x^4 + y^2$ D) $y = e^{5x} + 4\,y$

59. An integrating factor of the differential equation $\frac{dy}{dx} + P(x)\,y = Q(x)$ is given by

A) $e^{\int Q(x)dx}$ B) $e^{P(x)}$ C) $e^{Q(x)}$ D) $e^{\int P(x)dx}$

60. The general solution of the differential equation $(D+1)^2 y = e^{-x}$ where $D = \frac{d}{dx}$, is given by

(E) $y = (c_1 + c_2)x\, e^{-x} + x\, e^{-x^2}$ B) $y = (c_1 + c_2\, x)e^{-x} + \frac{x^2}{2}e^{-x}$

C) $y = c_1 e^{x} + c_2 e^{2x}$ D) $y = (c_1 + c_2 x^2)e^{-2x} + x^3$

61. Find the Fourier integral representation of the function $f(x) = \begin{cases} 1 & if\ |x| < 1 \\ 0 & if\ |x| > 1 \end{cases}$.

A) $\int_0^{\infty} \frac{\cos(wx)\sin(w)}{w^2}\, dw$

B) $\frac{2}{\pi}\int_0^{\infty} \frac{\sin(wx)\sin(w)}{w}\, dw$

C) $\frac{2}{\pi}\int_0^{\infty} \frac{\cos(wx)\sin(w)}{w}\, dw$

D) $\frac{2}{\pi}\int_0^{\infty} \frac{\cos(wx)\cos(w)}{w}\, dw$

62. Let $f(x) = x^2, (-1 < x < 1)$ e a periodic function with period p=2, then using the concept of Fourier series of f(x) , find the sum of the following

$1 - \frac{1}{4} + \frac{1}{9} - \frac{1}{16}$+-…….

A) $\frac{\pi^2}{12}$ B) $\frac{\pi}{3}$ C) $\frac{\pi}{6}$ D) 0

63. Let $z = f(x^2 - y^2)$, then the partial differential equation representing this surface is given by

(B) $y\,p = x^2 q$ B) $y^2 q = x\,p$ C) $y\,p + x\,q = 0$ D) $y\,q + xp = 0$

64. The partial differential equation of all the planes having equal x and y intercepts is given by

A) $\frac{\partial z}{\partial x} = \left(\frac{\partial z}{\partial x}\right)^2$ B) $\frac{\partial z}{\partial x} = x^2 + y^2$ C) $\frac{\partial z}{\partial y} = x^2 + y^2$ D) $\frac{\partial z}{\partial x} = \frac{\partial z}{\partial y}$

65. Find the volume of the solid generated by revolving the region between the y-axis and the curve $x = \frac{2}{y},\ 1 \le y \le 4$, about the y-axis

A) $3\,\pi$ B) 10 C) π D) 1

66. Find the length of the curve $x = \int_0^y \sqrt{\sec^4(t) - 1}\ \ dt,\ -\frac{\pi}{4} \le y \le \frac{\pi}{4}$.

A) 1.5 B) 2 C) 3 D) 2.5

67. The sum of the series $1 - \frac{1}{3} + \frac{1}{9} - \frac{1}{27} + \frac{1}{81} \mp \cdots$ ... ... is given by

A) 1 B) $\frac{3}{4}$ C) $\frac{2}{3}$ D) -2

68. The value of $\lim_{n\to\infty} \sqrt[n]{n^2}$ is

(B) -1 B) -2 C) 1 D) 0

69. Let $(x, y) = x^2 - xy + \frac{1}{2}y^2 + 3$. Find an upper bound for the error in the approximation of $(x, y) \approx L(x.y)$ (Linearization of f) over the rectangle R: $|x - 3| \le 0.1,\ |y - 2| \le 0.1$?

(B) 0.04 B) 1.40 C) 0.004 D) 0.40

70. Find the Laplace Transform of $f(t) = t\sin(3t)$

A) $s^3 + \frac{2}{s^2+9}$ B) $\sin(s) + \cos(s)$ C) $\frac{6s}{(s^2+9)^2}$ D) $\frac{s^3}{S^4+9}$

71. Let $f(t) = L^{-1}\left(\overline{f(s)}\right)$, then the inverse Laplace transform of $e^{-as}\overline{f\ (s)}$ is given by

A) $f(t - a)u(t)$ B) $f(t - a)\ u(t - a)$

C) $f(t)u(t - a)$ D) $f(t)u(t)$

72. Find the value of the integral $\int_{t=0}^{\infty}\int_{u=0}^{u=t} e^{-t}\,\frac{sinu}{u}\ du\ dt$

A) $\frac{\pi}{4}$ B) $-\frac{\pi}{4}$ C) $\frac{\pi}{2}$ D) $-\frac{\pi}{2}$

73. If $r = 5.0\ cm$ and $\square = 12.0\ cm$ to the nearest millimeter, what should we expect the maximum percentage error in calculating $V = \pi\, r^2\square$ to be?

A) 2.8% B) $\pm$ 3.5% C) $\pm$ 9% D) $\pm$4.83%

74. Which one of the following fields is conservative?

A) $(y + 3x)\hat{\imath}\ + (2x + z)\ \hat{\jmath}\ + (x - y)\hat{k}$

B) $(y^2 + z)\hat{\imath}\ + (x^2 + z)\ \hat{\jmath}\ + (x^2 + y)\hat{k}$

C) $(y + z)\hat{\imath}\ + (x + z)\ \hat{\jmath}\ + (x + y)\hat{k}$

D) $(y - z)\hat{\imath}\ + (x - z)\ \hat{\jmath}\ + (x - y)\hat{k}$

75. Evaluate the integral $\oint_C (y^2\,dx + x^2 dy)$, C: The triangle bounded by x=0, x+y=1, y=0 in the xy-plane.

A) 0 B) -1 C) 1 D) 2

x-x-x

M.E. Electrical Engg. (Power System)

1. Which of the following meters has a linear scale?
A) Thermocouple meter
B) Moving iron meter
C) Hot wire meter
D) Moving coil meter

2. The full scale deflection current of an ammeter is 1 mA and its internal resistance is 100 Ω. This is to have full deflection when 100 V is measured. What is the value of series resistor to be used?
A) 99.99 KΩ
B) 100 KΩ
C) 99.99 Ω
D) 100 Ω

3. In the case of power measurement by two wattmeters method in a balanced three phase system with a pure inductive load-.....
A) Both the Wattmeter will indicate the same but of opposite sign.
B) Both the Wattmeter will indicate zero.
C) Both the Wattmeter will indicate same value and of the same sign.
D) One Wattmeter will indicate zero and the other non-zero value.

4. Strain gauge is a passive transducer and is used for converting mechanical displacement into a change in-
A) Temperature
B) Resistance
C) Inductance
D) Capacitance

5. For an instrument the degree of repeatability in measurements is an alternative way of expressing its-
A) Precision
B) Accuracy
C) Sensitivity
D) Linearity

6. The pressure coil of a Dynamo type wattmeter is-
A) Highly inductive
B) Highly resistive
C) Purely resistive
D) Purely inductive

7. Consider the following statement
(i) The compensating coil of a low power factor wattmeter compensates the effect of the impedance of the current coil.
(ii) The compensating coil of a low power factor wattmeter compensates the effect of the impedance of the voltage coil circuit.
A) (i) is true but (ii) is false

B) (i) is false but (ii) is true
C) Both (i) and (ii) are true
D) Both (i) and (ii) are false

8. Which of the following represents the current gain of a common collector configuration?
A) α
B) ß
C) (1+ß)
D) $ß/(1+ß)$

9. An Average-reading digital multimeter reads 10 V when fed with a triangular wave, symmetric about time-axis. For the same input an RMS-reading meter will read-
A) $20/\sqrt{3}$
B) $20\sqrt{3}$
C) $10/\sqrt{3}$
D) $10\sqrt{3}$

10. The reverse current in a diode is of the order of-
A) kA
B) mA
C) μA
D) A

11. An ideal OP-AMP is an ideal-
A) Current controlled Current source
B) Current controlled Voltage source
C) Voltage controlled Voltage Source
D) Voltage controlled Current source

12. The purpose of an Attenuator is to-
A) Increase signal strength
B) Provide impedance matching
C) Decrease reflections
D) Decrease value of signal strength

13. The upper 128 bytes of an internal data memory from 80H through FFH usually represent……
A) General purpose registers
B) Special function registers
C) Stack pointer
D) Program counters

14. Which location specify the storage/loading of vector address during the interrupt generation?
A) Stack Pointer
B) Program Counter
C) Data Pointer

D) All of the above

15. The instruction, MOV AX, 1234H is an example of which addressing mode-
A) Register
B) Immediate
C) Direct
D) Based indexed

16. Which of the following form of Angle modulation in this?
If e= $10\sin(10^8 t + 3\sin 10^4 t)$
A) AM
B) FM
C) AM or FM
D) AM or PCM

17. In a network made up of linear resistors and ideal voltage sources, values of all resistors are doubled. Then the voltage across each resistor is
A) Doubled
B) Halved
C) Decreases four times
D) Not changed

18. Two networks are said to be dual when
A) Their node equations are the same
B) The loop equations of one network are analogous to the node equations of the other
C) Their loop equations are the same
D) The voltage sources of one networks are the current sources of the other

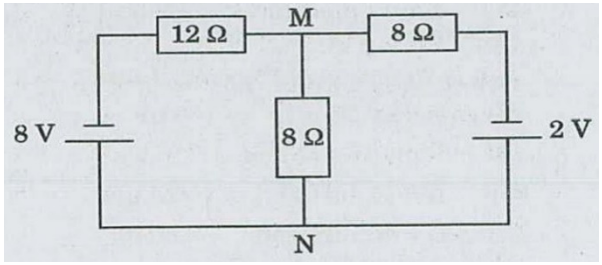
19. A voltage source having an internal impedance of 8+j6 Ω supplies power to resistive load. What should be the load resistance for maximum power transferred to it?
A) 8 Ω
B) 6Ω
C) 10 Ω
D) 0 Ω

20. If a voltmeter is connected like an ammeter in series with a load
A) The measurement reading will be too high
B) Almost no current will flow in the circuit
C) The meter will burn out
D) An inadmissibly high current will flow

21. The self-inductances of two coils are 8 mH and 18 mH. If the co-efficient of coupling is k=0.5, the mutual inductance of the coils is

A) 4 mH
B) 5 mH
C) 6 mH
D) 12 mH

22. What is the current through the 8Ω resistance connected across the terminals, M and N in the circuit?



A) 0 .34 A from M to N
B) 0.29 A from M to N
C) 0.29 A from N to M
D) 0.34 A from N to M

23. Two resistors 5Ω and 10Ω and an inductor L are connected in series across a 50cos(wt) voltage source. If the power consumed by the 5Ω resistor is 10W, the power factor of the circuit is

A) 1.0
B) 0.8
C) 0.6
D) 0.4

24. Consider the following statements:

Skewing of rotors slots in a 3-phase induction motor (cage rotor) may
1. introduce additional leakage reactance
2. eliminate slot harmonics
Which of the statements given above is/are correct?

A) Both 1 and 2
B) 1 only
C) 2 only
D) Neither 1 nor 2

25. A delta/star transformer has a phase to phase voltage transformation ratio of K (where K= delta phase voltage/ star phase voltage). The line to line voltage ratio of star/ delta connection is given by

A) K/√3
B) K
C) K√3
D) √3/K

26. In an auto transformer, power is transferred through,

A) Conduction process only

B) Induction process only
C) Both conduction and induction processes
D) Mutual coupling

27. The direction of rotation of a dc series motor can be reversed
A) By interchanging supply terminals
B) By interchanging supply terminals
C) Either by interchanging supply terminals or by interchanging field terminals
D) By interchanging supply terminals as well as field terminals

28. A dc shunt generator is supplying load of 1.8kW at 200 V. Its armature and field resistances are 0 .4Ω and 200Ω respectively. What is the generated emf?
A) 190V
B) 196V
C) 204V
D) 210V

29. The power factor of a synchronous motor
A) Improves with increase in excitation and may even become leading at high excitations
B) Decreases with increase in excitation
C) Is independent of its excitation
D) Increases with loading for a given excitation

30. A starting torque of 80 Nm is developed in an induction motor by an auto-transformer starter with a tapping of 30%. If the tapping of auto-transformer starter is 60%, then what is the starting torque?
A) 40 Nm
B) 160 Nm
C) 240 Nm
D) 320 Nm

31. In an induction motor what is the ratio of copper loss and rotor input?
A) 1/s
B) S
C) (1-s)
D) s/(1-s)

32. Consider the following statements:
The speed of a dc motor can be controlled by the variation of
1. Armature voltage
2. Field current
3. Armature circuit resistance
4. Angle of brush shift

Which of these statements are correct?
A) 1,2, and 3
B) 2,3, and 4

C) 1,3 and 4
D) 1,2 and 4

33. If P_1 and P_2 be the iron losses and copper losses of a transformer at full load, and the maximum efficiency of the transformer is at 75% of the full load, then what is the ratio of P_1 and P_2?
A) 9/16
B) 10/16
C) 3/4
D) 3/16

34. The snubber circuit is used in thyristor circuits for
A) Triggering
B) dv/dt protection
C) di/dt protection
D) Phase shifting

35. In a three phase full wave ac to dc converter, the ratio of output ripple frequency to the supply voltage frequency is
A) 2
B) 3
C) 6
D) 12

36. In a single phase semi-converter with discontinuous condition and extinction angle $\beta<\pi$, freewheeling action takes place for
A) α
B) α-β
C) β-π
D) Zero degree

37. A converter which can operate both in 3-pulse and 6-pulse modes is a
A) 1-phase converter
B) 3-phase half wave converter
C) 3-phase semi-converter
D) 3-phase full converter

38. What is the waveform of the current flowing through the diode in a buck boost converter?
A) Square wave
B) Triangular wave
C) Trapezoidal wave
D) Sinusoidal wave

39. For a step up dc-dc chopper with an input dc voltage of 220 volts, if the output voltage required is 330 volts and the non-conducting time of thyristor-chopper is 100μs, the ON time of thyristor-chopper would be
A) 66.6μs
B) 100μs

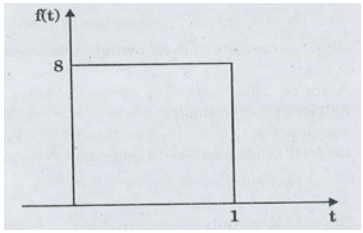
C) 150µs
D) 200µs

40. For a band pass signal extends from 1 KHz to 2 KHz. Then the minimum sampling frequency that needed to retain all information of the sampled signal is
A) 1 KHz
B) 2 KHz
C) 3 KHz
D) 4 KHz

41. A 500 MVA, 50 Hz, 3 phase turbo generator produces power at 22 kV. Generator is Y-connected and its neutral is solidly grounded. Its sequence reactances are $X_1=X_2=0.15$ and $X_0=0.05$ p.u. It is operating at rated voltage and disconnected from rest of the system. The magnitude of the sub-transient line current for single line to ground fault at the generator terminal in pu will be

A) 2.851
B) 6.667
C) 8.553
D) 3.548

42. The Laplace transform of the below function is:



A) F(s)= 8s(1-exp^-5)
B) F(s)= (8/s)(1+exp^-s)
C) F(s)= 8s(1+exp^-5)
D) F(s)= (8/s)(1-exp^-s)

43. Which one of the following describes correctly the effect of adding a zero to the system?
A) System becomes oscillatory
B) Root locus shifts towards imaginary axis
C) Relative stability of the system increases
D) Operating range of K for stable operation decreases

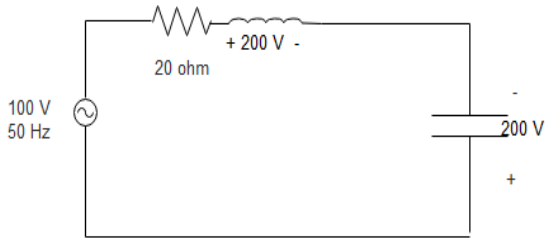
44. What is the initial slope of Bode magnitude plot of a type-2 system?
A) -20 db/decade
B) +20 db/decade
C) +40 db/decade
D) -40 db/decade

45. For a second-order differential equation, if the damping ratio ξ is unity, then
A) Then poles are imaginary and complex conjugate

B) The poles are in the right half of s plane
C) The poles are equal, negative and real
D) Both the poles are unequal, negative and real

46. The natural frequency of an undamped second-order system is 40 rad/s. If the system is damped with a damping ratio 0.3, the damped natural frequency in rad/s is
A) 20 rad/sec
B) 30 rad/sec
C) 35.5 rad/sec
D) 38.15 rad/sec

47. The current in the RLC circuit shown is



A) 5A
B) 10 A
C) 15 A
D) 25 A

48. The characteristic equation of a control system is given by
$$s(s + 4)(s^2 + 2s + 1) + k(s + 1) = 0$$
What are the angles of the asymptotes for the root loci of $k \geq 0$?
A) 60°, 180°, 300°
B) 0°, 180°, 300°
C) 120°, 180°, 240°
D) 0°, 120°, 240°

49. The direction of the net encirclements of the origin of Real-Imaginary plane in a Nyquist plot for the system to be stable is
A) Clockwise of the origin
B) Counter-Clockwise of the origin
C) Left hand side s-plane
D) Right hand side s-plane

50. The lag system of a 'lag-lead compensator' has one pole and one zero. Then pole and zero are
A) Real and pole is to the left of zero
B) Real and pole is to the right of zero
C) Imaginary and pole is above zero
D) Imaginary and pole is below zero

51. A system with characteristic equation $F(s) = S^4 + 6s^3 + 23s^2 + 40s + 50$ will have closed loop poles such that

A) All poles lie in the left half of the s-plane and no pole lies on imaginary axis
B) Two poles lie symmetrically on the imaginary axis of the s-plane
C) All four poles lie on the imaginary axis of the s-plane
D) All four poles lie in the right half of the s-plane

52. Which of the following is a binary equivalent of 5_8?

A) 001
B) 011
C) 101
D) 111

53. In a combinational logic circuit, which of the following is not correct?

A) Input is a Boolean function
B) The output is fixed for a given input
C) Output is dependent on inputs and previous outputs
D) All of these

54. In NOR-NOR configuration, the minimum number of NOR gates needed to implement the switching function X+XY'+XY'Z is

A) 5
B) 3
C) 2
D) 0

55. On a master-slave flip-flop, when is the master enabled?

A) When the gate is LOW
B) When the gate is HIGH
C) Both of the above
D) Neither of the above

56. A cascaded arrangement of flip-flops where the output of one flip-flop drives the clock input of the following flip-flop, is known as

A) Synchronous counter
B) Ripple counter
C) Ring counter
D) Up counter

57. The number of flip- flops required to construct an 8-bit shift register will be

A) 32
B) 16
C) 8
D) 4

58. Which of the following satisfies the condition for a critically damped RLC series circuit?

A) $0\left(\frac{R}{2L}\right) < \frac{1}{\sqrt{LC}}$
B) $\left(\frac{R}{2L}\right) > \frac{1}{\sqrt{LC}}$

C) $\left(\frac{R}{2L}\right) = \frac{1}{\sqrt{LC}}$
D) None of these

59. When a delta connected network, with all its branches having an equal resistance, is converted into an equivalent star connected network, the magnitude of the resistance of each branch is
A) Equal to the branch resistance in delta
B) Greater than the branch resistance in delta
C) Less than the branch resistance in delta
D) None of these

60. The form factor of an alternating quantity is given by
A) $\frac{\text{average value}}{\text{rms value}}$
B) $\frac{\text{average value}}{\text{maximum value}}$
C) $\frac{\text{rms value}}{\text{average value}}$
D) $\frac{\text{rms value}}{\text{maximum value}}$

61. To which of the following circuits, the two wattmeter method is not suitable to measure power in a three phase circuit?
A) Unbalanced star connected loads with neutral inaccessible
B) Balanced star or delta connected loads
C) Unbalanced delta connected loads
D) None of these

62. Which of the following theorems help in simplifying computations when the load across a circuit is varying?
A) Superposition
B) Norton's
C) Thevenin's
D) Maximum power transfer

63. Reactive power in a circuit signifies
A) Energy consumed by the magnetic/electric field
B) Energy consumed by the resistance of the inductance/capacitance
C) Energy exchanged between the magnetic/electric field and the source
D) Energy consumed by the resistance in the circuit

64. When a pure LC parallel circuit is in resonance, the circuit condition can be represented by
A) A short circuit
B) An open circuit
C) A normal parallel circuit
D) None of these

65. A network delivers maximum power to the load resistance when it is
A) Greater than Norton's equivalent resistance of the network
B) Equal to Thevenin's equivalent resistance of the network
C) Less than source resistance

D) Less than Norton's equivalent resistance of the network

66. The impedance of a parallel circuit is (10 j30 –Ω) at 1 MHz. The values of circuit elements will be
A) 10 and 6.4 mH
B) 100 and 4.7 nF
C) 10 and 4.7 mH
D) 100 and 6.4 nF

67. As the frequency is increased, the skin effect
A) Decreases
B) Increases
C) Remains the same
D) Any of the above

68. The corona loss in a 50 Hz system is 0.2 Kw per phase per Km. At a frequency of 60 Hz the corona loss would be
A) 0.17 kW/phase/km
B) 0.3 kW/phase/km
C) 0.22 kW/phase/km
D) 0.24 kW/phase/km

69. The insulation resistance of a 2 km long cable is 150 MΩ. For a length of 20 km, the insulation resistance will be
A) 15 MΩ
B) 1500 MΩ
C) 300 MΩ
D) 150 MΩ

70. An Acceleration factor is used in load flow studies by
A) G-S method
B) NR method
C) De-coupled method
D) All the above

71. The inertia constant H of a turbo generator of 200 MVA is 6. The value of H corresponding to a base of 300 MVA will be
A) 9
B) 4
C) 6
D) 13.5

72. The regulation of a line at full load 0.8 power factor lagging is 11%. The regulation at full load 0.8 power factor leading can be
A) About 20 %
B) About 15 %
C) About 3 %
D) About 30 %

73. In actual practice the string efficiency is improved by using
A) Capacitance grading
B) Guarding ring
C) Discs of different sizes
D) Any of the above

74. Which one of the following is used for communication with the aim of achieving high figure of merit in HVDC circuit breakers?
A) Oil interrupter
B) Air interrupter
C) Vacuum interrupter
D) SF6 interrupted
`

75. The maximum demand on a steam power station is 480 MW. If the annual load factor is 40%, then the total energy generated annually is
A) 19819.2×10^5 kWh
B) 18819.2×10^5 kWh
C) 17819.2×10^5 kWh
D) 16819.2×10^5 kWh

x-x-x

M.E.(Computer Science & Engg.)

1. Which one of the following is true?

A) $R \cap S = (R \cup S) - [(R - S) \cup (S - R)]$

B) $R \cup S = (R \cap S) - [(R - S) \cup (S - R)]$

C) $R \cap S = (R \cup S) - [(R - S) \cap (S - R)]$

D) $R \cap S = (R \cup S) \cup (R - S)$

2. The time complexity of computing the transitive closure of a binary relation on a set of n elements is known to be

A) O(nlogn)

B) $O(n^{3/2})$

C) $O(n^3)$

D) O(n)

3. The power set of the set $\{\phi\}$ is

A) $\{ \phi \}$

B) $\{ \phi, \{ \phi \} \}$

C) $\{0\}$

D) $\{0, \phi, \{ \phi \} \}$

4. Cyclometric complexity of a flow graph G with n vertices and e edges is

A) V(G)= e+n-2

B) V(G)= e-n+2

C) V(G)= e+n+2

D) V(G)= e-n-2

5. A relation R in {1,2,3,4,5,6} is given by {(1,2),(2,3),(3,4),(4,4),(4,5)}. This relation is:

A) Reflexive

B) Symmetric

C) Transitive

D) Not reflexive, not symmetric and not transitive

6. a<<1 is equivalent to:

A) Multiplying a by 2

B) Dividing a by 2

C) Adding 2 to a

D) Subtracting 2 to a

7. Which of the following algorithms has running time $O(n^2)$ in the worst case but O(nlogn) on average?

A) Bubble Sort

B) Tournament Sort

C) Merge Sort

D) Quick Sort

8. The upper bound on T(n)=3T(n/2) +n is

A) $O(n^{lgn})$

B) $O(n^{lg3})$

C) $O(n^2)$

D) $O(n^{lgn}+n)$

9. Which one of the following statements is false?

A) Optimal binary search tree construction can be performed efficiently using dynamic programming

B) Breadth- first search cannot be used to find converted components of a graph

C) Given the prefix and postfix walks over a binary tree, the binary tree cannot be uniquely constructed

D) Depth-first search can be used to find connected components of a graph

10. An error detecting code in which code is the remainder resulting from dividing the bits to be checked by a predetermined binary number, is known as

A) Cyclic redundancy check

B) Checksum

C) Error detecting code

D) Error rate

11. Which address is the loopback address?

A) 0.0.0.1

B) 127.0.0.0

C) 127.0.0.1

D) 255.255.255.255

12. As a frame travels through a routed network the MAC address will always

A) Change to reflect the current source and destination

B) The source address will remain the same but the destination address will change

C) The source address will change and the destination address will change.

D) Nothing changes

13. Which two of the following four regular expressions are equivalent? (ε is the empty string).

(i) (00) * (ε + 0)

(ii) (00)*

(iii) 0*

(iv) 0 (00)*

A) (i) and (ii)

B) (ii) and (iii)

C) (i) and (iii)

D) (iii) and (iv)

14. What will be the output of the following Program

```
main (){
Int a=10,b,c;
```

```
b=!a;
c=~a;
printf("%d %d", b,c);
}
```

A) 10 -10
B) 0 -11
C) -10 -10
D) 0 0

15. Suppose that the set A contains 5 elements and the set B contains 2 elements. How many different functions f : A → B can one define?

A) 10
B) 25
C) 16
D) 32

16. Which of the following is false

A) A graph is a sub-graph of its union with any other graph.
B) The intersection of two graphs is not necessarily a sub-graph of both of them.
C) A spanning sub-graph of a graph G is a sub-graph that contains all the vertices of G.
D) Hamilton path is a path that includes all the vertices of a graph.

17. A full binary tree with ***n*** leaves contains:

A) n nodes
B) $\log_2$ n nodes
C) 2n – 1 nodes
D) 2^n nodes

18. Which of the following is a hash function?

A) Shortest distance
B) Mid square
C) Folding
D) Extraction

19. If A ⊕ B = C, then

A) A ⊕ C = B
B) B ⊕ C = A
C) A ⊕ B ⊕ C = 0
D) All of the above

20. How many pulses are needed to change the contents of a 8 bit up-counter from 10101100 to 00100111?

A) 134
B) 133
C) 124
D) 123

21. The correct way to de-allocate dynamically created one dimensional array arr is
A) free(arr)
B) free(arr[0])
C) free(*arr)
D) realloc(arr)

22. Given the declaration statement, int* p[2][3][4]; which of the following definitions of q is valid?
A) Int* (*q)[3][4]=p;
B) Int* (*q)[2][3][4]=p;
C) Int ****q=p;
D) Int *q[2][3][4]=(*)p;

23. The 8085 microprocessor responds to the presence of an interrupt
A) as soon as the TRAP pin becomes 'high'
B) by checking the TRAP pin for ' high' status at the end of each instruction fetch
C) by checking the TRAP pin for 'high' status at the end of the execution of each instruction
D) by checking the TRAP pin for 'high' status at regular intervals

24. Consider a weighted complete graph G on the vertex set $\{v_1,...,v_n\}$ such that the weight of the edge (v_i,v_j) is $2|i - j|$. The weight of a minimum spanning tree of G is:
A) n-1
B) 2n-2
C) nc_2
D) n^2

25. The maximum number of binary trees that can be formed with three unlabeled nodes is:
A) 1
B) 4
C) 5
D) 3

26. Let G be the non-planar graph with the minimum possible number of edges. Then G has
A) 9 edges and 5 vertices
B) 9 edges and 6 vertices
C) 10 edges and 5 vertices
D) 10 edges and 6 vertices

27. Suppose a processor does not have any stack pointer register. Which of the following statements is true?
A) It cannot have subroutine call instruction
B) In can have subroutine call instruction, but no nested subroutine calls
C) Nested subroutine calls are possible, but interrupts are not
D) All sequences of subroutine calls and also interrupts are possible

28. A certain pipelined RISC machine has 8 general-purpose registers R0, R1, . . . , R7 and supports the following operations.
ADD Rs1, Rs2, Rd Add Rs1 to Rs2 and put the sum in Rd
MUL Rs1, Rs2, Rd Multiply Rs1 by Rs2 and put the product in Rd
An operation normally takes one cycle; however, an operation takes two cycles if it produces a result required by the immediately following operation in an operation sequence. Consider the expression *AB+ ABC+ BC*, where variables *A*, *B*, *C* are located in registers R0, R1, R2. If the contents of these three registers must not be modified, what is the minimum number of clock cycles required for an operation sequence that computes the value of *AB+ ABC+ BC* ?

A) 5
B) 6
C) 7
D) 8

29. Consider a 2-way set associative cache consisting of 128 lines with line size of 128 words. CPU generates a 20-bit address of a word in main memory. The number of bits in the TAG, LINE and WORD fields are respectively:

A) 9,6,5
B) 7,7,6
C) 6,6,8
D) 7,6,7

30. Consider a grammar with the following productions

I. $S \rightarrow a\ \alpha\ b \mid b\ \alpha\ c \mid \alpha\ B$
II. $S \rightarrow \alpha\ S \mid b$
III. $S \rightarrow \alpha\ bb \mid ab$
IV. $S\ \alpha \rightarrow bdb \mid b$

The above grammar is

A) Context free
B) Regular
C) Context sensitive
D) LR (k)

31. Context free languages are closed under

A) Union, Kleene Closure, Complement, Reversal
B) Union, Kleene Closure, Concatenation, Reversal
C) Union, Kleene Closure, Reversal, Intersection
D) Complement, Kleene Closure, Union, Concatenation

32. For the settings of *pfile* using the following command
>chmod 2666 *pfile*, Which of the following is not true

A) The file has the SUID bit set
B) Mandatory locking has been enabled
C) The file is not executable by any user
D) The associated group has read and write permissions

33. Purpose of a start bit in RS 232 serial communication protocol is

A) to synchronise receiver for receiving every byte
B) to synchronise receiver for receiving a sequence of bytes
C) a parity bit
D) to synchronise receiver for receiving the last byte

34. Analysis models depict software in which three representations?

A) Architecture, Interface, Component
B) Cost, Risk, Schedule
C) Information, Function, Behavior
D) ER Diagram, DFD, Class Diagram

35. Identify error in following SQL:

```
SELECT RollNo , Sum(Marks)
FROM Student_table
GROUP BY RollNo
HAVING Student_name='Rahul';
```

A) Syntax Error
B) SUM() is not an aggregate function
C) HAVING cannot be used with GROUP BY
D) The Having condition has to be based on some column that appears in the select list

36. Which of the following is not a type of DMA

A) Block Transfer DMA
B) Cycle stealing DMA
C) Interleaved DMA
D) Phase shifted DMA

37. For a pipelined CPU with s ingle ALU, consider the following situations

1. The $j+1^{st}$ instruction uses the result of the jth instruction as an operand.
2. The execution of conditional jump instruction
3. The jth and $j+1^{st}$ instruction requires ALU at the same time.

A) 1 and 2 only
B) 2 and 3 only
C) 3 Only
D) All of the three

38. In a public key cryptographic system, a sender has encrypted a message with the recipient's public key. What key does the recipient use to decipher the message?

A) Recipient's public key
B) Recipient's private key
C) Sender's public key
D) Sender's private key

39. The address sequence generated by tracing particular program executing in a pure demand paging system with 100 records (addresses) per page with 1 free main memory frame is recorded

as follows. What is the number of page faults?
0100,0200,0430,0499,0510,0530,0560,0120,0220,0240,0260,0320,0370

A) 13
B) 8
C) 7
D) 10

40. Which of the following statements is false?
A) Every NFA can be converted to an equivalent DFA
B) Every non-deterministic Turing machine can be converted to an equivalent deterministic Turing machine
C) Every regular language is also a context-free language
D) Every subset of a recursively enumerable set is recursive

41. A linker reads four modules whose lengths are 200,800,600 and 500 words, respectively. If they are loaded in that order, what are the relocation constants?
A) 0,200,500,600
B) 0,200,1000,1600
C) 200,500,600,800
D) 200,700,1300,2100

42. The contents of accumulator after the execution of following instruction will be
MVI A, A7H
ORA A
RLC
A) CFH
B) 4FH
C) 4EH
D) CEH

43. Which of the following statements is false?
A) Virtual memory implements translation of a program's address space into physical memory address space
B) Virtual memory allows each program to exceed the size of the primary memory
C) Virtual memory increases the degree of multiprogramming
D) Virtual memory reduces the context switching overhead

44. Which of the following is not a necessary condition for a deadlock to occur?
A) Mutual Exclusion
B) Hold & Wait
C) Pre-emption
D) Circular wait

45. Banker's algorithm for resource allocation deals with
A) Deadlock prevention

B) Deadlock avoidance
C) Deadlock recovery
D) Mutual exclusion

46. A computer has a 24-bit virtual address space and 512 byte pages. A page table entry takes 2 – bytes. A multilevel page table is used because each page table must be contained with a page. How many levels are required?
A) 2
B) 3
C) 4
D) 5

47. For all the delayed branch instructions, irrespective of whether the condition evaluates to true or false.
A) The instruction following the conditional branch instruction in memory is executed.
B) The first instruction in fall through path is executed.
C) The first instruction in taken path is executed.
D) The branch takes longer to execute than any other instruction.

48. The primary key on table STUDENT is the RollNO column. Which of the following statements will not use the associated index on RollNO?
A) select * from STUDENT where nvl (RollNO, '00000') = '12';
B) select * from STUDENT where RollNO = '12';
C) select RollNO, LASTNAME from STUDENT where RollNO = '12';
D) select 1 from STUDENT where RollNO = '12';

49. Your unmask value is set to 022 and you create a file. Which set of permissions are associated with this file?
A) rw -rw - rw -
B) rwxr- -r --
C) rw-r- -r--
D) rwxrwxrwx

50. Which of the following IP address is not in range of IP address spanned by CIDR address 192.168.10.0/20
A) 192.168.12.0
B) 192.168.11.0
C) 192.168.16.0
D) 192.168.15.0

51. What can be the maximum size of stage -1 boot program at the beginning of a hard disk, assuming a 4 bytes bootstrap magic bit pattern, 64 bytes of for partition table and 512 bytes of sector size.
A) 448 bytes
B) 508 bytes

C) 444 bytes
D) 512 bytes

52. An LALR(1) parser for a grammar G can have shift-reduce (S-R) conflicts if and only if
A) The SLR(1) parser for G has S-R conflicts
B) The LR(1) parser for G has S-R conflicts
C) The LR(0) parser for G has S-R conflicts
D) The LALR(1) parser for G has reduce-reduce conflicts

53. Consider a machine with 128 MB physical memory and a 24-bit logical address space. If the page size is 2KB, what is the size of the page table?
A) 16 KB
B) 8 KB
C) 2 KB
D) 24 KB

54. What are the port numbers used by FTP for File Transfer and Control connection respectively
A) 21,20
B) 20,21
C) 20,25
D) 21,22

55. Which of the following statement(s) is (are) true
(i) In a tree, there is only one unique path connected any two nodes
(ii) If G is a tree with p vertices and q edges then q=p-1
A) Only (i)
B) Only (ii)
C) Both (i) and (ii)
D) None is true

56. A B+ tree index is to be created on the name attribute of relation STUDENT. Assume that all the students names are of length 8 bytes, disk blocks are of size 512 bytes and index pointers are of size 4 bytes. Given this scenario, what would be the best choice of degree(i.e. number of pointers per node) of the B+ tree.
A) 16
B) 42
C) 43
D) 44

57. Which of the following statements are true?
1. Every left recursive grammar can be converted into the right recursive grammar and vice versa
2. All ε -productions can be removed from the context free grammar by suitable transformations

3. The language generated by the context free grammar all of whose productions are of form $X \rightarrow w$ or $X \rightarrow wY$ (where w is string of terminals and Y is non terminal), is always regular.
4. Derivation trees of strings generated by a context free grammar in Chomsky Normal form are always binary trees

A) All are true
B) 2, ,3, and 4 only
C) 1, 3, 4 only
D) 1,2, and 4 only

58. Testing of software in actual environment with actual data is called
A) Alpha Testing
B) Beta Testing
C) Gamma testing
D) Real Testing

59. To provide more subnets, a class B address is assigned the subnet mask of 255.255.248.0. How many hosts are possible per subnet?
A) 2048
B) 2046
C) 2044
D) 4096

60. What is the sequence of execution of constructor in following derivations, if object of Class D is instantiated

```
Class A: public B, virtual C
{};
Class D: Public A
{};
```

A) C, B, A, D
B) A, B, C, D
C) D, A, B, C
D) D, B, C, A

61. In a demand –paged memory system, it takes 200 ns to satisfy a memory request if the page is in memory. If the page is not in memory, the request takes 7ms if a free frame is available or the page to be swapped out has not been modified. It takes 15ms if the page to be swapped out has been modified. What is the effective access time if the page fault rate is 5% and 60% of the time the page to be replaced has been modified.
A) 715.34 µs
B) 590.19µs
C) 780.01 µs
D) 800.12 µs

62. Which one of the following statements if FALSE?
A) Any relation with two attributes is in BCNF
B) A relation in which every key has only one attribute is in 2NF

C) A prime attribute can be transitively dependent on a key in a 3 NF relation.
D) A prime attribute can be transitively dependent on a key in a BCNF relation.

63. Which command in UNIX shell displays the file and directory names that begin with characters a,b, or c and that end with number 1
A) ls –d abc*1
B) ls [a-c*1]
C) ls –ld [abc]*1
D) ls {1,b,c} /* 1

64. For a function of three variables, how many robust and worst test cases are to be generated
A) 13, 15
B) 13, 125
C) 18, 125
D) 18, 32

65. Which of the following is not associated with the DHCP relay agents?
A) It is BOOTP relay agent
B) It direct DHCPDISCOVER packets to DHCP server
C) It is used to find the DHCP server on other networks
D) It is used when multiple DHCP servers are present on the netework.

66. The recurrence equation
T(1)=1
T(n) = 2 T(n-1) +n, n>=2 evaluates to
A) 2^{n+1} –n-2
B) 2^{n} –n
C) 2^{n+1} –2n -2
D) 2^{n+1} + n

67. Suppose you are developing a software product in organic application mode. Estimated size of product is 10,0000 lines of code. The nominal effort using COCOMO
A) Should be more than 24 but less than 30 Person months
B) Should be more than 30 but less than 36 Person months
C) Should be more than 36 Person months
D) Should be less than 24 Person months

68. What will be the length and volume of a program using Halstead's measure if number of unique operators and operands are 8 each and total count of operators and operands are 20,15 respectively.
A) 48, 140
B) 46, 150
C) 40, 150
D) 48,150

69. In Unified Modelling Language, - sign in class diagram represents

A) Constructor
B) Positive attributes
C) Public visibility
D) Private Visibility

70. Your current working directory is the /mount/drive_1/first directory. Which command string put you into the /mount/drive_2/second directory?
A) cd ../second
B) cd /drive_2/second
C) cd ../ .. /drive_2/second
D) cd ../ ../second

71. Which of the following statement is not true?
A) Virtual functions should not be static and must be a member of a class
B) Virtual functions may be declared as friend of another class
C) Constructors cannot be declared as virtual but destructors can be declared as virtual.
D) Virtual functions cannot return value when defined in public or protected section.

72. Which of the characteristic is common to traps, subroutine calls and supervisor calls but different in interrupts?
A) Interrupts calls are synchronous and others are asynchronous
B) Interrupts calls are asynchronous and others are synchronous
C) Only Interrupt calls are caused due to hardware errors
D) Only Interrupt calls change the execution mode to kernel mode.

73. Which of the following instruction can only be executed in the Kernel mode?
A) Write the program counter
B) Read the time-of- day clock.
C) Subroutine Calls
D) Change Memory Management Registers

74. Consider a hash table with hash function (4x +3)mod 5 with starting value 0 and no linear probing. What should be contents of hash table after inserting following values 2,5,7,9. Note that "_" represents blank space.
A) _2759
B) _2_59
C) _7_5_9
D) 72_59

75. Which one of the following uses UDP as the transport protocol?
A) HTTP
B) Telnet
C) DNS
D) SMTP

x-x-x

M.Sc. Statistics

1. The probability density function (pdf) of a random variable X is $f(x) = (x^{-1/2})/4$, $0< x<4$ and zero otherwise. The value of $P(X>1)$ is :

A) 1 B) ½ C) ¾ D) ¼

2. Probability is .7 that an industrial worker suffers from respiratory problem if exposed to toxic gases and probability is .2 that the worker suffers from respiratory problem if not exposed to toxic gases. The probability that an industrial worker suffers from respiratory problem is:

A) .14 B) .7 C) .9 D) 1

3. Let Q_i be the ith quartile of a distribution, i= 1, 2, 3. The distribution is positively skewed if:

A) $Q_3 - Q_1 > Q_2 - Q_1$ B) $Q_3 - Q_1 < Q_2 - Q_1$

C) $Q_3 - Q_2 < Q_2 - Q_1$ D) $Q_3 - Q_2 > Q_2 - Q_1$

4. The total number of simple random samples with replacement each of size n which can be drawn from a population of size N are:

A) n^N B) N^n C) ${}^NC_n$ D) nN

5. The total number of simple random samples without replacement each of size n which can be drawn from a population of size N are:

A) ${}^NC_n$ B) N^n C) n^N D) nN

6. Let the random variable X follows binomial distribution with parameters n and p. Define random variable Y = X/n . Variance of Y is:

A) np(1-p) B) p(1-p) C) p(1-p)/n D) $p(1-p)/n^2$

7. Let the random variable W follows Poisson distribution such that 2P[W=0] = P[W=1]. Variance of W is:

A) 2 B) 1 C) ½ D) e^2

8. The mean and variance of a binomial random variable X are 4 and 3, respectively. The value of the parameters (n, p) is

A) (4, ¾) B) (12, 3/4) C) (16, 3/ 4) D) (16, ¼)

9. A person selects a lottery ticket from a bag containing 10 lottery tickets numbered from 1 to 10. The probability the number on the drawn ticket is either even or a multiple of 3 is:

A) 8/10 B) 2/10 C) 7/10 D) 5/10

10. Area under normal probability density function above third quartile is:

A) .75 B) .25 C) .5 D) .40

11. A simple random sample without replacement of size two was drawn from a lot containing 2 defective and 4 non defective items. The probability of the event that the first drawn item is defective and second is non-defective is:

A) 8/36 B) 1/8 C) 7/9 D) 4/15

12. A discrete random variable X takes values -2, -1, 0, 1, 2 with probabilities .2, .1, .4, .1, .2 , respectively. Variance of X is:

A) 1.8 B) 0 C) ½ D) .18

13. Poisson distribution is:

A) Symmetric B) Positively skewed

C) Negatively skewed D) Continuous

The three units, say I, II and III of an industrial organization manufacture identical items in the proportion 2: 3: 5, respectively. It is also known that the units I, II and III manufacture 3%, 4% and 10% defective items, respectively. From the entire daily production of all the three units a person selects one item randomly.

Answer questions 14 and 15 using the above information:

14. The probability that the selected item will be non-defective is:

A) .932 B) .068 C) .17 D) .83

15. If the drawn item was defective, then the probability that it was manufactured by unit III is:

A) .068 B) .932 C) .204 D) .735

16. Let the random variable X follows normal distribution. The distribution of –X will be:

A) Binomial B) Poisson C) Normal D) Negatively Skewed

17. An unbiased coin and an unbiased die are tossed simultaneously. Probability that the coin shows head and die shows an even number on upper faces is:

A) 1/12 B) 1 C) 3/4 D) ¼

18. Two unbiased dice are tossed simultaneously. The probability that the sum of numbers on the upper faces of both dice will be odd is:

A) ¼ B) ¾ C) ½ D) 2/3

19. The probability density function (pdf) of a random variable X is $f(x) = 1$, $0<x<1$. Variance of X will be:

A) ½ B) 1/12 C) ¾ D) ¼

20. Let b_{xy} and b_{yx} be the two regression coefficients in simple linear regression. Then the relation between Karl Pearson's correlation coefficient, denoted by r, and these regression coefficients is:

A) $r^2 = (b_{xy}/b_{yx})^2$ B) $r^2 = (b_{xy}b_{yx})^2$ C) $r = (b_{xy}b_{yx})^2$ D) $r^2 = (b_{xy}\, b_{yx})$

Let A and B be two events in the sample space S such that $P(A \cup B) = .7$, $P(A) = .4$ and $P(B) = x$. Answer questions 21 and 22 using this information.

21. The value of x for which A and B are mutually exclusive is :

A) .3 B) ½ C) .28 D) 0

22. The value of x for which A and B are independent is:

A) .3 B) ½ C) ¾ D) ¼

A lot contains 4 defective and 6 Non-defective items. A person selects a simple random sample of 4 items from the lot. Use this information to answer questions 23 and 24.

23. The probability that the sample contains two defective and two non defective if the items were drawn with replacement is:

A) .52 B) .0576 C) .3456 D) 3/7

24. The probability that the sample contains two defective and two non defective if the items were drawn without replacement is:

A) .52 B) .0576 C) .3456 D) 3/7

25. The mean, mode and standard deviation of a distribution are 15, 12 and 3 respectively. The coefficient of skewness of this distribution is:

A) 1 B) -1 C) 4 D) 5

26. Let the matrix G be such that $\begin{pmatrix} 5 & 4 \\ 1 & 1 \end{pmatrix}$ G = $\begin{pmatrix} 1 & -2 \\ 1 & 3 \end{pmatrix}$, then G is equal to:

A) $\begin{pmatrix} 3 & -14 \\ 4 & -17 \end{pmatrix}$ B) $\begin{pmatrix} 1 & -2 \\ 3 & 1 \end{pmatrix}$ C) $\begin{pmatrix} 1 & 3 \\ -2 & 1 \end{pmatrix}$ D) $\begin{pmatrix} -3 & -14 \\ 4 & 17 \end{pmatrix}$

27. The quadratic form x^tGx is said to be positive semidefinite when all the eigen values of G are:

A) Positive B) Negative C) Non-negative D) non-positive

28. The sum of the characteristic roots of the matrix $\begin{bmatrix} 3 & 10 & 15 \\ -2 & -3 & -4 \\ 3 & 5 & 7 \end{bmatrix}$ is

A) 13 B) 7 C) -9 D) 15

29. The product of the eigen values of the matrix $\begin{bmatrix} 2 & 2 & 1 \\ 1 & 3 & 1 \\ 1 & 2 & 2 \end{bmatrix}$

A) 5 B) 7 C) 12 D) 4

30. If H = $\begin{pmatrix} 3 & -4 \\ 1 & -1 \end{pmatrix}$, then H^n is:

A) $\begin{pmatrix} 1+2n & -4n \\ n & 1-2n \end{pmatrix}$ B) $\begin{pmatrix} 3^n & (-4)^n \\ 1 & (-1)^n \end{pmatrix}$ C) $\begin{pmatrix} 1+3n & 1-4n \\ 1+n & 1-n \end{pmatrix}$ D) $\begin{pmatrix} 1+2n & -4n \\ 1+n & 1-2n \end{pmatrix}$

31. The extreme value of $(x)^{1/x}$ is:

A) e B) $(1/e)^e$ C) $(e)^{1/e}$ D) 1

32. If f(x) = sinx - x/2 is an increasing function, then the range of x is

A) $0< x <\pi/3$ B) $-\pi/3 < x < 0$ C) $-\pi/6 < x <\pi/6$ D) $-\pi/3< x <\pi/3$

33. The Jacobean of the transformation $x= r\cos\theta$, $y = r\sin\theta$ is:

A) 1 B) –r C) r D) 1/r

34. The value of $\iint 2x(x-y)dx\,dy$ over the region R={(x,y): 0<x<1, |y|<x} is:

A) 2/3 B) 0 C) ½ D) 1

35. The value of $\sum_{x=0}^{3}\sum_{y=0}^{2}(x+y)$ is:

A) 12 B) 30 C) 15 D) 1/30

36. $\frac{d^2}{dxdy}(1-e^{-x}-e^{-y}+e^{-x-y})$ is equal to:

A) 0 B) $-e^{-x-y}$ C) e^{-x-y} D) e^{-xy}

37. Let f(x,y) = 1/y, then the value of $\iint f(x,y)dxdy$ over the region R = {(x,y): 0<x<y, 0<y<1} is:

A) 1 B) ½ C) 2 D) ¾

38. The value of $\iint 2dx\,dy$ over the region R={(x,y): 0<x, 0<y, x+y <1} is:

A) ½ B) 1 C) 2 D) ¾

39. $\int_0^{\pi/2}\frac{\sqrt{\sin x}}{(\sin x)^{1/2}+(\cos x)^{1/2}}dx$ is equal to:

A) 0 B) π/2 C) π/4 D) 1

40. $\int_0^{\pi}\frac{x\sin x\ dx}{1+\cos^2 x}$ is equal to :

A) $\pi^2/2$ B) $\pi^2/4$ C) ¼ D) π/4

41. $\int_0^{1}\frac{\log(1+x)\ dx}{1+x^2}$ is equal to

A) (π/8)log2 B) (π/4)log2 C) (π/2)log2 D) log2

42. $\int_0^{\pi}\sin^7 x\,dx$ is equal to

A) 0 B) 16/35 C) 32π/35 D) 32/35

43. $\int_0^{\pi/2}\sin^4 x\cos^2 x dx$ is equal to

A) 1/16 B) 1/32 C) π/32 D) π/4

44. The value of $\iint xydxdy$ over the region R = { (x,y): 0<x<1, x^2<y<2-x} is:

A) ¾ B) 3/8 C) 3/5 D) 3/7

45. The area of the segment cut off from the parabola $x^2 = 8y$ by the line x-2y+8 =0 is:

A) 48 B) 120 C) 36 D) 24

46. $\int_0^1 \int_0^{1-x} dx\,dy$ represents the area of a:

A) Rectangle B) Triangle C) Square D) Circle

47. $\int_0^1 \frac{\sin^{-1} x}{x} dx$ is equal to:

A) π/2 B) log2 C) (π/2)log2 D) -(π/2)log2

48. $\int_0^{\pi} \log \sin x dx$ is equal to:

A) –π log2 B) -(π/2)log2 C) (π/2)log2 D) log2

49. $\int_0^{\pi/6} \cos^4 3\theta \sin^3 6\theta d\theta$ is equal to:

A) 0 B) π/30 C) 8/45 D) 1/15

50. The value of $\int_0^{\infty} \frac{dx}{(1+x^2)^{7/2}}$ is :

A) 8/15 B) 8π/15 C) π/15 D) 3π/4

51. $\int_0^a \frac{dx}{x+(a^2-x^2)^{1/2}}$ is equal to:

A) π/2 B) π/4 C) $a^2/4$ D) aπ/4

52. Let $y = x^x$. Then dy/dx is:

A) $x\, x^{x-1}$ B) $x^x \log x$ C) $x^x (\log x + 1)$ D) $x^{x+1}\log x$

53. Let $y = a^x$, then dy/dx is:

A) xa^{x-1} B) $a^x \log a$ C) (aloga)/x D) $xa^{x-1}\log a$

54. Let the matrix $G = \begin{pmatrix} 1 & 4 \\ 2 & 3 \end{pmatrix}$ Then the value of G^2 -4G -5I is

A) O B) G^{-1} C) I D) G

55. The value of $\lim_{x\to 0}(1+x)^{1/x}$ is:

A) ∞ B) 1 C) e D) 1/e

56. The value of $\lim_{x\to \pi/2}(\sin x)^{\tan x}$ is:

A) 0 B) 1 C) e D) 1/e

57. The value of $\lim_{x\to 0}\{(xe^x - \log(1+x))/x^2\}$ is:

A) ½ B) 3 C) 1 D) 3/2

58. The value of $\lim_{x\to 0}(1/\sin x - 1/x)$ is:

A) ∞ B) 1 C) 0 D) 1/2

59. The slope of the normal at any point θ to the curve $x = a(\cos\theta + \theta\cos\theta)$, $y = a(\sin\theta - \theta\cos\theta)$ is

A) $\tan\theta$ B) $\cot\theta$ C) $-\tan\theta$ D) $-\cot\theta$

60. The value of $\lim_{x\to 0}(\log x/\cot x)$ is:

A) 1 B) 0 C) 2 D) ½

61. The series $1 - 1/\sqrt{2} + 1/\sqrt{3} - 1/\sqrt{4}$ is

A) Convergent B) Divergent C) Oscillatory D) Both B and C

62. The series 5/2 -7/4 +9/6- 11/8 + ……. is

A) Convergent B) Divergent C) Oscillatory D) Both A and C

63. The series $1 + 1/2^2 - 1/3^2 - 1/4^2 + 1/5^2 + 1/6^2 - 1/7^2 - 1/8^2$ ……. is

A) Convergent B) Divergent C) Oscillatory D) Both B and C

64. The series $1 + x + x^2/2 + x^3/3 +$…… is convergent for:

A) All values of B) $x > 0$ C) $x < 0$ D) $x < -1$

65. The series $x - x^2/2 + x^3/3 -$ ….. $+ (-1)^n x^n/n +$ …. is convergent for values of x the interval:

A) (-1, 1) B) $|x| > 1$ C) (-1, 1] D) $|x| \le 1$.

66. The value of $\int_a^{a+2\pi} \sin^2 nx\,dx$ is

A) 0 B) π C) $\pi/2$ D) n/2

67. The value of $\int_a^{a+2\pi} \sin mx \cos mx\,dx$ is.

A) 0 B) π C) $\pi/2$ D) m/2

68. $\sin(ix)$ is equal to (here $i = \sqrt{-1}$)

A) sinhx B) i sinhx C) e^{ix} D) $e^{ix + 2\pi}$

69. For complex number Z = x + i y, if $\frac{e^{Z} + e^{-z}}{2} = i$, then e^{Z} is equal to

A) 1 B) -1 C) i D) –i

70. For complex number Z , the value of $\tanh^{-1} z$ is:

A) log [(1-Z)/(1+z)] B) .5 log [(1-Z)/(1+z)]

C) log [(1+Z)/(1-z)] D) .5 [log {(1+Z)/(1-z)}]

71. For complex number Z = x +iy, the imaginary part of e^{Z^2} is:

A) e^{i2xy} B) e^{ixy} C) $e^{ix^2y^2}$ D) $e^{i(x+y)}$

72. The value of $\int_C \frac{e^{2Z}}{(Z^2 - 3Z + 2}dz$, where C: |Z| = 3 is:

A) $2\pi i$ B) $2\pi i e^4$ C) $2\pi i (e^4 - e^2)$ D) $2\pi i (e^4 + e^2)$

73. The value of $\int_0^{2+i} (\overline{Z})^2 dz$ along the real axis to 2 and then vertically to 2+i is:

A) 5(2-i)/3 B) 14/3 C) 14 + 11i D) (14 + 11i)/3

74. The solution of the differential equation dy/dx +y/x = x^2 under the condition that y=1 when x= 1, is:

A) $4xy = x^3+3$ B) $4xy = x^4 +3$ C) $4xy = y^4+3$ D) $4xy = y^3 +3$

75. The particular integral of the differential equation $(D^2 +D)y = x^2+2x+4$ is (here D =d/dx):

A) $(x^2/3) +4x$ B) $(x^3/3) +4$ C) $(x^3/3)+4x$ D) $(x^3/3)+4x^2$

x-x-x

M.E. Civil Engg. (Construction Technology & Management)

1. If the volume of voids is equal to the volume of solids in a soil mass, then the values of porosity and voids ratio respectively are

A) 1.0 and 0.0
B) 0.0 and 1.0
C) 0.5 and 1.0
D) 1.0 and 0.5

2. In hydrometer analysis for a soil mass

A) Both meniscus correction and dispersing agent correction are additive
B) Both meniscus correction and dispersing agent correction are subtractive
C) Meniscus correction is additive and dispersing agent correction is subtractive
D) Meniscus correction is subtractive and dispersing agent correction is additive

3. When the plastic limit of a soil is greater than the liquid limit, then the plasticity index is reported as

A) Negative
B) zero
C) Non-plastic (NP)
D) One

4. The hydraulic head that would produce a quick condition in a sand stratum of thickness 1.5 m, specific gravity 2.67 and voids ratio 0.67 is equal to

A) 1.0m
B) 1.5 m
C) 2.0 m
D) 3m

5. The slope of isochrone at any point at a given time indicates the rate of change of

A) Effective stress with time
B) Effective stress with depth
C) Pore water pressure with depth
D) Pore water pressure with time

6. The slenderness ratio of a column supported throughout its length by a masonry wall is

A) zero

B) 10

C) 100

D) Infinity

7. Select the incorrect statement

A) Effective cohesion of a soil can never have a negative value.
B) Effective angle of internal friction for coarse grained soils is rarely below 30°.
C) Effective angle of internal friction for a soil increases as state of compact-ness increases.
D) Effective angle of internal friction is a complicated function of mineralogy and clay size content.

8. For supplying water to rabi crop, kharif crop and sugarcane, the channel is designed for a capacity equal to the greater of the water requirement of

A) Rabi or kharif
B) Rabi and kharif or sugarcane
C) Rabi and sugarcane or kharif and sugarcane
D) Rabi or kharif or sugarcane

9. A simply supported beam A carries a point load at its mid span. Another identical beam B carries the same load but uniformly distributed over the entire span. The ratio of the maximum deflections of the beams A and B, will be

A) 2/3
B) 3/2
C) 5/8
D) 8/5

10. The ratio of crippling loads of a column having both the ends fixed to the column having both the ends hinged, is

A) 1
B) 2
C) 3
D) 4

11. If a solid shaft (diameter 20 cm, length 400 cm, N = 0.8 × 105 N/mm2) when subjected to a twisting moment, produces maximum shear stress of 50 N/mm 2, the angle of twist in radians, is

A) 0.001
B) 0.002

C) 0.0025
D) 0.003

12. Infiltration rate is always
A) more than the infiltration capacity
B) less than the infiltration capacity
C) equal to or less than the infiltration capacity
D) equal to or more than the infiltration capacity

13. Lacing bars in a steel column should be designed to resist
A) bending moment due to 2.5% of the column load
B) shear force due to 2.5% of the column load
C) 2.5% of the column load
D) Both (A) and (B)

14. If d is the depth of the aquifer through which water is flowing, then the relationship between permeability k and transmissible T isgiven by
A) T = kd
B) T = k/d
C) T= Vkd
D) k= VTd

15. If the ratio of the span to the overall depth does not exceed 10, the stiffness of the beam will ordinarily be satisfactory in case of a
A) Simply supported beam
B) Continuous beam
C) Cantilever beam
D) Fixed Beam

16. For M 150 grade concrete (1:2:4) the moment of resistance factor is
A) 0.87
B) 8.50
C) 7.50
D) 5.80

17. In the zone of R.C.C. beam where shear stress is less than 5 kg/cm^2, nominal reinforcement is provided at a pitch of
A) One -half lever arm of the section
B) One-third lever arm of the section
C) Lever arm of the section
D) One and half lever arm of the section

18. Spacing of stirrups in a rectangular beam, is
A) Kept constant throughout the length
B) Decreased towards the centre of the beam
C) Increased at the ends
D) Increased at the centre of the beam

19. By over-reinforcing a beam, the moment of resistance can be increased not more than
A) 10 %
B) 15 %
C) 20 %
D) 25 %

20. The diameter of transverse reinforcement of columns should be equal to one-fourth of the diameter of the main steel rods but not less than
A) 4 mm
B) 5 mm
C) 6 mm
D) 7 mm

21. Turbidity is measured on
A) Standard silica scale
B) Standard cobalt scale
C) Standard platinum scale
D) Platinum cobalt scale

22. The length of lap in tension reinforcement should not be less than the bar diameter × (actual tension / four times the permissible average bond stress) if it is more than
A) 18 bar diameters
B) 24 bar diameters
C) 30 bar diameters
D) 36 bar diameters

23. Based on punching shear consideration, the overall depth of a combined footing under a column A, is
A) (Area of the column A × Safe punching stress)/Load on column A)
B) (Perimeter of column A × Safe punching stress)/(Load on column A + Upward pressure × Area of the column)
C) (Perimeter of column A × Safe punching stress)/(Load on column A × Upward pressure × Area of the column)
D) None of these

24. Trap efficiency of a reservoir is a function of

A) Capacity/inflow ratio
B) Capacity/outflow ratio
C) Outflow/inflow ratio
D) None of the above

25. The width of the flange of a T-beam should be less than
A) One- third of the effective span of the T -beam
B) Distance between the centres of T-beam
C) Breadth of the rib plus twelve times the thickness of the slab
D) Least of the above

26. The amount of reinforcement for main bars in a slab, is based upon
A) Minimum bending moment
B) Maximum bending moment
C) Maximum shear force
D) Minimum shear force

27. The desirable length of overtaking zone as per IRC recommendation is equal to
A) Overtaking sight distance
B) Two times the overtaking sight distance
C) Three times the overtaking sight distance
D) Five times the overtaking sight distance

28. If b is the wheel track of a vehicle and h is the height of centre of gravity above road surface, then to avoid overturning and lateral skidding on a horizontal curve, the centrifugal ratio should always be
A) Less than b/2h and greater than co-efficient of lateral friction
B) Less than b/2h and also less than co-efficient of lateral friction
C) Greater than b/2h and less than co-efficient of lateral friction
D) Greater than b/2h and also greater than coefficient of lateral friction

29. The absolute minimum radius of curve for safe operation for a speed of 110 kmph
A) 110 m
B) 220 m
C) 440 m
D) 577 m

30. The transition curve used in the horizontal alignment of highways as per IRC recommendations is
A) Spiral
B) Lemniscate
C) Cubic parabola
D) Any of the above

31. The percentage compensation in gradient for ruling gradient of 4%

and horizontal curve of radius 760 m is

A) 0.1 %
B) 1 %
C) 10%
D) No compensation

32. If an ascending gradient of 1 in 50 meets a descending gradient of 1 in 50, the length of summit curve for a stopping sight distance of 80 m will be

A) Zero
B) 64m
C) 80m
D) 60m

33. Which of the following is known as design capacity?

A) Basic capacity
B) Theoretical capacity
C) Possible capacity
D) Practical

34. The percentage of filtered water, w hic h is used for back washing in rapid sand filter is about

A) 0.2 t o 0.4
B) 0.4 t o 1.0
C) 2 t o 4
D) 5 t o 7

35. As compared to ordinary portland cement, high alumina cement has

A) Higher initial setting time but lower final setting time
B) Lower initial setting time but higher final setting time
C) Higher initial and final setting times
D) Lower initial and final setting times

36. The factor of safety for

A) Steel and concrete are same
B) Steel is lower than that for concrete
C) Steel is higher than that for concrete
D) Cannot be compared

37. Select the correct statement

A) Material cost of a rivet is higher than that of a bolt.
B) Tensile strength of a bolt is lesser than that of a rivet.
C) Bolts are used as a temporary fastenings whereas rivets are used as permanent fastenings.
D) Riveting is less noisy than bolting.

38. For a continuous slab of 3 m x 3.5 m size, the minimum overall depth of slab to satisfy vertical deflection limits is

A) 50 mm
B) 75 mm
C) 100 mm
D) 120 mm

39. The percentage of reinforcement in case of slabs, when high strength deformed bars are used is not less than

A) 0.15
B) 0.12
C) 0.30
D) 1.00

40. For satisfactory working of a sludge digestion unit, the pH range of digested sludge should be maintained as

A) 4.5 to 6.0
B) 6.5 to 8.0
C) 8.5 to 10.0
D) 10.5 to 12.0

41. The diameter of ties in a column should be

A) More than or equal to one fourth of diameter of main bar
B) More than or equal to 5 mm
C) More than 5 mm but less than one-fourth of diameter of main bar
D) More than 5 mm and also more than one-fourth of diameter of main bar

42. The main reinforcement in the toe of a T- shaped R C. Retaining wall is provided on

i) Top face parallel to the wall
ii) Top face perpendicular to the wall
iii) Bottom face paralleUo the wall
iv) Bottom face perpendicular to the wall

The correct answer is

A) only (ii) is correct
B) (i) and (ii) are correct
C) (iii) and (iv) are correct
D) only (iv) is correct

43. In a counterfort retaining wall, the main reinforcement in the stem at mid span is provided on

A) front face only
B) inner face only
C) both front face and inner face
D) from the toe

44. Assertion A : The load factor for live load is greater than that for dead load.
Reason R : The live loads are more uncertain than dead loads.
Select your answer based on the coding system given below :
A) Both A and R are true and R is the correct explanation of A.
B) Both A and R are true but R is not the correct explanation of A.
C) A is true but R is false.
D) A is false but R is true.

45. Shrinkage of concrete depends upon
i) humidity of atmosphere
ii) passage of time
iii) stress The correct answer is
A) (i) and (ii)
B) (ii) and (iii)
C) only (iii)
D) All (i), (ii) and (iii)

46. High carbon content in the steel causes
A) Decrease in tensile strength but increase in ductility
B) Increase in tensile strength but decrease in ductility
C) Decrease in both tensile strength and ductility
D) Increase in both tensile strength and ductility

47. Cube strength of controlled concrete to be used for pretensioned and post-tensioned work respectively should not be less than
A) 35 MPa and 42 MPa
B) 42 MPa and 35 MPa
C) 42 MPa and 53 MPa
D) 53 MPa and 42 MPa

48. Which of the following losses of prestress occurs only in pretensioning and not in post-tensioning?
A) Elastic shortening of concrete
B) Shrinkage of concrete
C) Creep of concrete
D) Loss due to friction

49. In a ring beam subjected to uniformly distributed load
i) shear force at mid span is zero
ii) shear force at mid span is maximum
iii) torsion at mid span is zero
iv) torsion at mid span is maximum The correct answer is
A) (i) and (iii)
B) (i)and(iv)
C) (ii) and (iii)

D) (ii) and (iv)

50. The maximum tolerance in a 20 m chain is
A) ±2 mm
B) ±3 mm
C) ±5 mm
D) ±8 mm

51. In the quadrantal bearing system, a whole circle bearing of 293° 30′ can be expressed as
A) W23°30'N
B) N66°30'W
C) S113°30'N
D) N23°30'W

52. Size of a theodolite is specified by
A) The length of telescope
B) The diameter of vertical circle
C) The diameter of lower plate
D) The diameter of upper plate

53. A telescope is said to be inverted if its
A) Vertical circle is to its right and the bubble of the telescope is down
B) Vertical circle is to its right and the bubble of the telescope is up
C) Vertical circle is to its left and the bubble of the telescope is down
D) Vertical circle is to its left and the bubble of the telescope is up

54. If a tripod settles in the interval that elapses between taking a back sight reading and the following foresight reading, then the elevation of turning point will
A) Increase
B) Decrease
C) Not change
D) Both A and B

55. If the R.L. of a B.M. is 100.00 m, the back- sight is 1.215 m and the foresight is 1.870 m, the R.L. of the forward station is
A) 99.345 m
B) 100.345 m
C) 100.655m
D) 101.870m

56. Which of the following methods of con-touring is most suitable for a hilly terrain?
A) Direct method
B) Square method
C) Cross-sections method
D) Tacheometric method

57. Bowditch rule is applied to
A) An open traverse for graphical adjustment
B) A closed traverse for adjustment of closing error
C) Determine the effect of local attraction
D) To measure the true bearing

58. For a tacheometer the additive and multi-plying constants are respectively
A) 0 and 100
B) 100 and 0
C) 0 and 0
D) 100 and 100

59. When a liquid rotates at a constant angular velocity about a vertical axis as a rigid body, the pressure intensity varies
A) Linearly with radial distance
B) As the square of the radial distance
C) Inversely as the square of the radial distance
D) Inversely as the radial distance

60. If the velocity is zero over half of the cross-sectional area and is uniform over the remaining half, then the momentum correction factor is
A) 1
B) 4/3
C) 2
D) 4

61. In a forced vortex motion, the velocity of flow is
A) Directly proportional to its radial distance from axis of rotation
B) Inversely proportional to its radial distance from the axis of rotation
C) Inversely proportional to the square of its radial distance from the axis of rotation
D) Directly proportional to the square of its radial distance from the axis of rotation

62. Coefficient of velocity for Borda's mouth piece running full is
A) 0.611
B) 0.707
C) 0.855
D) 1.00

63. The discharge over a broad crested weir is maximum when the depth of flow is
A) H/3
B) H/2
C) 2 H/5
D) 2 H/3
Where H is the available head.

64. Which of the following statements is correct?

A) Lower critical Reynolds number is of no practical significance in pipe flow problems.
B) Upper critical Reynolds number is significant in pipe flow problems.
C) Lower critical Reynolds number has the value 2000 in pipe flow
D) Upper critical Reynolds number is the number at which turbulent flow changes to laminar flow.

65. Stanton diagram is a

A) Log-log plot of friction factor against Reynolds number
B) Log-log plot of relative roughness against Reynolds number
C) Semi-log plot of friction factor against Reynolds number
D) Semi-log plot of friction factor against relative roughness

66. For hydro-dynamically smooth boundary, the friction coefficient for turbulent flow is

A) Constant
B) Dependent only on Reynolds number
C) A function of Reynolds number and relative roughness
D) Dependent on relative roughness only

67. The process of lagooning is primarily a means of

A) Reducing the excessive flow in sewers
B) Disposing of sludge
C) Increasing the capacity of storage re-servoirs
D) Increasing flow of sewage through imhoff tanks

68. In PERT analysis, the time estimates of activities and probability of their occurrence follow

A) Normal distribution curve
B) Poisson's distribution curve
C) Beta distribution curve
D) Parabolic curve

69. If the optimistic time, most likely time and pessimistic time for activity A are 4, 6 and 8 respectively and for activity B are 5, 5.5 and 9 respectively, then

A) Expected time of activity A is greater than the expected time of activity B
B) Expected time of activity B is greater than the expected time of activity A
C) Expected time of both activities A and B are same
D) Not related to each other

70. The constraints in case of resource smoothening operation would be

A) Resources

B) Project duration time
C) Both resources and project duration time
D) Critical time

71. Interfering float is the difference between
A) Total float and free float
B) Total float and independent float
C) Free float and independent float
D) Free float and slack

72. Chlorine demand of water is equal to
A) Applied chlorine
B) Residual chlorine
C) Sum of applied and residual chlorine
D) Difference of applied and residual chlorine

73. The method of analysis of distribution system in which the domestic supply is neglected and fire demand is considered is
A) Circle method
B) Equivalent pipe method
C) Electrical analysis method
D) Hardy cross method

74. The self cleansing velocity for all sewers in India is usually
A) Less than 1.0 m/sec
B) 1.0 m/sec to 1.2 m/sec
C) 1.5 m/sec to 2.0 m/sec
D) 3.0 m/sec to 3.5 m/sec

75. The correct relation between theoretical oxygen demand (TOD), Biochemical oxygen demand (BOD) and Chemical oxygen demand (COD) is given by
A) TOD>BOD>COD
B) TOD>COD>BOD
C) BOD>COD>TOD
D) COD>BOD>TOD

x-x-x