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1. A cycle consists of two isothermal and two isentropic processes is known as :
   - (A) Otto cycle
   - (B) Joule cycle
   - (C) Stirling cycle
   - (D) Carnot cycle

2. In an isometric projection the radius of a sphere it is equal to :
   - (A) 0.82 R
   - (B) R
   - (C) 1.22 R
   - (D) 2 R

3. The function of steam nozzle is to convert :
   - (A) heat energy steam into kinetic energy
   - (B) heat energy steam into rotational energy
   - (C) kinetic energy into heat energy of steam
   - (D) heat energy steam into pressure energy

4. Dryness fraction is the ratio of :
   - (A) mass of dry steam to the mass of water vapour in suspension
   - (B) mass of water vapour in suspension to the mass of water vapour and mass of dry steam
   - (C) mass of dry steam to the mass of dry steam and mass of water vapour in suspension
   - (D) mass of water vapour in suspension to the mass of dry steam

5. If the thermal efficiency of Carnot heat engine is 50 percent, then coefficient of performance of a refrigerator working within the same temperature limit would be :
   - (A) 1
   - (B) 2
   - (C) 3
   - (D) 4

6. During throttling process :
   - (A) internal energy does not change
   - (B) pressure does not change
   - (C) volume does not change
   - (D) enthalpy does not change

7. Which one of the following parameter is significant to ascertain chemical equilibrium of a system?
   - (A) Clapeyron of equation
   - (B) Maxwell relation
   - (C) Gibb's function
   - (D) Helmholtz function

A

3

8. The percentage of carbon in cast iron usually varies between :
   (A) 0.1 to 0.2 %
   (B) 0.5 to 1.0%
   (C) 1.5 to 2.5%
   (D) 2.5 to 3.5%

9. Martensite is a supersaturated solution of carbon in :
   (A) Alpha iron
   (B) Beta iron
   (C) Gamma iron
   (D) Delta iron

10. Dislocation in materials is a ——————— defect.
    (A) Point
    (B) Line
    (C) Plane
    (D) Volumetric

11. The head over a 90° V-notch increases from 0.15 to 0.3 m. The ratio of the new discharge to the original discharge is :
    (A) 1.414
    (B) 2.25
    (C) 4.00
    (D) 5.657

12. A floating body will remain in stable equilibrium so long as :
    (A) the metacentre M lies below the centre of gravity
    (B) the metacentre M lies above the centre of gravity
    (C) the metacentre and centre of gravity remain at the same position
    (D) None of these

13. The nominal thickness of boundary layer represents the distance from the surface to a point where :
    (A) the flow ceases to be laminar
    (B) velocity is 99 percent of its asymptotic limit
    (C) the shear stress becomes maximum
    (D) the flow behaves as if it were rotational

14. A pitot-tube is an instrument for measuring :
    (A) pressure of flow
    (B) discharge of fluid
    (C) velocity of flow
    (D) total energy

15. The specific speed $Ns = \left(N\sqrt{Q}\right)/ H^{3/4}$ for a double suction pump is to be evaluated. The discharge would be taken :
    (A) half the actual discharge
    (B) actual discharge
    (C) double the actual discharge
    (D) square of the actual discharge

16. If two pumps identical in all respects and each capable of delivering a discharge Q against a head H are connected in series, the resulting discharge is :

    (A)   2Q against a head 2H   (B)   2Q against a head H

    (C)   Q against a head 2H   (D)   Q against a head H.

17. The power obtained from an impulse turbine is proportional to the number of nozzles used. A pelton turbine with six nozzles has a specific speed of 8.1. The specific speed per nozzle is :

    (A)   1.35   (B)   2

    (C)   3.3   (D)   8.1

18. During idling of a petrol engine requires :

    (A)   chemically correct mixture   (B)   variable mixture

    (C)   lean mixture   (D)   rich mixture

19. In investment casting the pattern :

    (A)   is made of wax

    (B)   is made of plastic

    (C)   is always made of the material to be cast

    (D)   is not used

20. In the Orsat apparatus KOH solution is used to absorb :

    (A)   carbon monoxide   (B)   carbon dioxide

    (C)   oxygen   (D)   none of the above

21. For the same compression ratio :

    (A)   thermal efficiency of otto cycle is greater than that of diesel cycle

    (B)   thermal efficiency of otto cycle is less than that of diesel cycle

    (C)   thermal efficiency of otto cycle is same as that for a diesel cycle

    (D)   thermal efficiency of diesel cycle cannot be predicted

22. The knocking in SI engine gets reduced :

    (A)   by increasing the compression ratio

    (B)   by retarding the spark advance

    (C)   by increasing the inlet air temperature

    (D)   by increasing the cooling water temperature

23. Where is the Hook's joint used in an automobile?

    (A)   between gearbox and propeller shaft

    (B)   between flywheel and clutch

    (C)   between differential gear and wheel

    (D)   between clutch and gear box

24. Work input to the air compressor with *n* as index of compression :
   (A) increases with increase in value of *n*
   (B) decrease with increase in value of *n*
   (C) remains same whatever the value of *n*
   (D) first increases and then decreases with value of *n*

25. 1 tonne of refrigeration is equivalent to:
   (A) 336 kJ/min
   (B) 210 kJ/min
   (C) 1400 kJ/min
   (D) 540 kJ/min

26. The thermal conductivity is expressed as :
   (A) W/mK
   (B) W/m²K
   (C) W/hmK
   (D) W/h²m²K

27. In SI engines which one of the following is the correct order of the fuels with increasing detonation tendency :
   (A) Paraffins, Olefins, Naphthenes, Aromatics
   (B) Aromatics, Naphthenes, Paraffins, Olefins
   (C) Naphthenes, Olefins, Aromatics, Paraffins
   (D) Aromatics, Napthenes, Olefins, Paraffins

28. The Nusselt number in natural convection is a function of Prandtl number and :
   (A) Stanton number
   (B) Biot number
   (C) Reynolds number
   (D) Grashoff number

29. Which of the following properties of a refrigerant is undesirable?
   (A) high critical temperature
   (B) low specific heat of liquid
   (C) low specific volume vapour
   (D) high boiling point

30. The emissivity of a body is equal to absorptivity when the body remains in thermal equilibrium. This law refers to as :
   (A) Planck's law
   (B) Lambert's law
   (C) Kirchoff's law
   (D) Wien's displacement law

31. In a vapour compression cycle the condition of refrigerant is saturated liquid :
   (A) before entering the compressor
   (B) before passing through the condenser
   (C) after passing through the condenser
   (D) after passing through the expansion valve

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A

32. Which of the following processes is generally used in winter air conditioning?
   (A) dehumidification   (B) humidification
   (C) cooling and dehumidification (D) heating and humidification

33. Upto critical radius of insulation the heat flow :
   (A) decreases
   (B) increases
   (C) heat flux decreases
   (D) convection heat loss is less than conduction heat loss

34. As relative humidity decreases the dew point will be ——————— wet bulb temperature.
   (A) higher than   (B) equal to
   (C) lower than   (D) none of the above

35. A two stroke engine has a speed of 750 rpm. A four stroke engine having an identical cylinder size running at 1500 rpm. The theoretical output of the two stroke engine will be :
   (A) twice that of the four stroke engine
   (B) half that of the four stroke engine
   (C) the same as that of the four stroke engine
   (D) depend upon whether it is a CI or SI engine

36. The main reason for adopting the axial flow compressors instead of centrifugal compressors in aircraft turbine is that :
   (A) starting torque for axial flow compressor is high
   (B) the frontal area of axial flow compressor is considerably less
   (C) the efficiency of middle speed range is higher
   (D) pressure ratio per stage is high

37. Morse test measures the indicated power of :
   (A) SI engine   (B) CI engine
   (C) Steam engines (D) Steam turbine

38. Which one of the following is a lower pair?
   (A) cam and follower   (B) toothed gearing
   (C) shaft in a bearing (D) ball and race in bearing

39. Coriolis component of acceleration is present exists whenever a point moves along a path that has :
   (A) tangential acceleration   (B) centripetal acceleration
   (C) linear motion   (D) rotational motion

40. The speed of an engine is seen to fluctuate Continuously above and below mean speed. The governor is said to be :

    (A) isochronous   (B) hunting

    (C) over sensitive   (D) unstable

41. Which motor will be suitable for traction?

    (A) DC series motor   (B) DC shunt constant speed

    (C) DC shunt adjustable speed   (D) compound motor

42. When two spur gears having involute profiles on their tooth engage the line of action is tangential to :

    (A) pitch circle   (B) dedendum circle

    (C) addendum circle   (D) base circle

43. Crowning of pulleys is generally done :

    (A) to reduce the belt friction

    (B) to dissipate the heat generated due to friction

    (C) to perfect the belt joint so that it may not break while running

    (D) to prevent the belt from running of the pulley

44. A simply supported beam of span 10 m carrying a load of 500 N at the midspan will have a maximum bending moment of :

    (A) 500 Nm   (B) 1250 Nm

    (C) 2500 Nm   (D) 5000 Nm

45. The diameter of shaft is increased from 50 mm to 100 mm all other conditions remaining unchanged. How many times the torque carrying capacity increases?

    (A) 2 times   (B) 4 times

    (C) 8 times   (D) 16 times

46. If a compression coil spring of stiffness 10 N/m is cut into two equal parts and the used in parallel the equivalent spring stiffness will be :

    (A) 10 N/m   (B) 20 N/m

    (C) 40 N/m   (D) 80 N/m

47. A differential gear in an automobile is :

    (A) simple gear train   (B) epicyclic gear train

    (C) compound gear train   (D) none of these

48. The engine of an aeroplane rotates in clockwise direction when seen from the tail end and the aeroplane takes turn to left. The effect of gyroscopic couple on the aeroplane will be :
    (A) to raise the nose and dip the tail   (B) to dip the nose and raise the tail
    (C) to raise the nose and tail   (D) to dip the nose and tail

49. In a locomotive the ratio of the connecting rod length to crank radius is kept large in order to :
    (A) minimise the effect of primary force   (B) minimise the effect of secondary force
    (C) have perfect balancing   (D) start the locomotive quickly

50. In order to facilitate the starting of locomotive in any position, the crank of a locomotive with two cylinders are placed :
    (A) 45°   (B) 90°
    (C) 120°   (D) 180°

51. The ratio of maximum displacement of the forced vibration to the deflection due to static force is known as :
    (A) damping factor   (B) damping coefficient
    (C) logarithmic decrement   (D) magnification factor

52. A mild steel rod having 50 mm diameter and 500 mm length is to be turned on a lathe. Determine the machining lime to reduce the rod to 45 mm in one pass when cutting speed is 30 m/min and a feed of 0.7 mm/rev is used :
    (A) 1.74 min   (B) 2.74 min
    (C) 3.74 min   (D) 4.74 min

53. For producing more accurate holes, the sequence of operations to be followed is :
    (A) centering, drilling, boring, reaming   (B) centering, boring, drilling, reaming
    (C) drilling, centering, boring, reaming   (D) drilling, reaming, boring, centering

54. The main purpose of chaplets used in foundary practice are :
    (A) to provide efficient venting   (B) to ensure directional solidification
    (C) to support the core   (D) to align the mould boxes

55. In oxy-acetylene gas welding the volume of oxygen required per unit volume of acetylene :
    (A) 1   (B) 1.5
    (C) 2   (D) 2.5

56. Tempering of hardened steel is done to increase its :
    (A) grain size   (B) surface condition
    (C) ductility   (D) carbon content

57. The angle which is found between the face of the cutting tool and the normal to the machined surface at the cutting edge is called :

(A) rake angle
(B) relief angle
(C) clearance angle
(D) cutting angle

58. The hardness with which the bond holds the cutting points or abrasives in place defined by the term :

(A) structure
(B) grit size
(C) grain size
(D) grade

59. Which of the following is not a part of Capstan lathe?

(A) chuck
(B) tailstock
(C) spindle
(D) tool post

60. The gears manufactured on generating principle in :

(A) hobbing
(B) milling
(C) broaching
(D) shaping

61. Quick returning mechanism is used in :

(A) milling machine
(B) broaching machine
(C) slotting machine
(D) lathe machine

62. During ultrasonic machining the metal removal is achieved by :

(A) high frequency eddy currents
(B) high frequency sound waves
(C) hammering action of abrasive particles
(D) rubbing action between tool and work piece

63. According to Indian standard specifications the total number of designated grades of fundamental tolerances are :

(A) 18
(B) 21
(C) 24
(D) 28

64. In a metric thread designated by M12 × 1.5 specify that the thread has :

(A) cross sectional area 12 mm² and depth 1.5
(B) nominal diameter 12 mm and pitch 1.5
(C) nominal diameter 12 mm and number of threads per mm is 1.5
(D) Pitch 1.5 and depth 12 mm

65. In a steam engine the joint to be used for connecting the piston rod and cross-head is :

    (A)   knucle joint   (B)   cotter joint

    (C)   oldham's coupling   (D)   bolted joint

66. Creep in a belt drive is due to :

    (A)   improper crowning

    (B)   plasticity of belt material

    (C)   differential elongation of belt due to difference in tension on two sides of the pulley

    (D)   Change in the coefficient of friction due to over heating

67. Annual demand for a product costing Rs. 100 is 400. Ordering cost per order is Rs. 100 and carrying cost is Rs. 2 per unit per year. The economic lot size is then :

    (A)   200   (B)   300

    (C)   400   (D)   500

68. CPM and PERT techniques are used for :

    (A)   layout planning   (B)   financial management

    (C)   executing a new project   (D)   increasing productivity

69. ABC analysis in materials management is a method of classifying the inventories based on :

    (A)   the value of annual usage item   (B)   economic order quantity

    (C)   volume of material consumption   (D)   quantity of material used

70. Break even point is the point where :

    (A)   fixed and variable cost line will intersect

    (B)   variable and total cost lines intersect

    (C)   total cost and fixed cost lines intersect

    (D)   total cost and sales revenue lines intersect

71. The core product model required for any CAD/CAM system :

    (A)   Data model   (B)   Solid model

    (C)   Prototype   (D)   Geometric model

72. Group technology is suitable for production of :

    (A)   medium range variety and high range quality

    (B)   high range variety and high range quantity

    (C)   medium range variety and medium range quantity

    (D)   low range variety and low range quality

73. In FMS the tools are identified by means of :
    - (A) colour code
    - (B) bar code
    - (C) PLC
    - (D) digital code

74. Just in time manufacturing philosophy emphasizes on :
    - (A) man power
    - (B) manufacturing
    - (C) profit
    - (D) inventory

75. A joint sector undertaking :
    - (A) is jointly owned by several share holders
    - (B) is jointly owned by private parties and government
    - (C) is jointly managed by two directors
    - (D) is jointly owned by state and central governments

76. C-charts are the best example of :
    - (A) Binomial distribution
    - (B) Poisson distribution
    - (C) Normal distribution
    - (D) None of these

77. Cellular manufacturing system is designed on the basis of :
    - (A) JIT
    - (B) MRP
    - (C) GT
    - (D) Layout

78. In linear programming the shadow prices are :
    - (A) the values assigned to one unit of capacity
    - (B) maximum cost per item
    - (C) cost of bought out items
    - (D) cost of items manufactured in the plant

79. A feeler gauge is used to check :
    - (A) pitch of gears
    - (B) shape of screw threads
    - (C) bore of discs and pulleys
    - (D) thickness of a clearance

80. The relation between tool life (T) and cutting speed (V) is expressed as :
    - (A) $TV^n = C$
    - (B) $V + nT = C$
    - (C) $T + nV = C$
    - (D) $VT^n = C$

81. Which amendment of the constitution lowering the voting age from 21 to 18?
    - (A) 73
    - (B) 62
    - (C) 64
    - (D) 61

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82. The power to create new state or alter the boundaries of existing state vested upon —————— authority.

    (A) Supreme Court   (B) Prime Minister

    (C) Parliament   (D) State legislature

83. The constitution prescribe the age qualification for being appointed as Governor of the state :

    (A) 25 years   (B) 35 years

    (C) 45 years   (D) 40 years

84. Which article of the constitution provides the right to protection against arrest and sentention?

    (A) Article 21   (B) Article 19

    (C) Article 20   (D) Article 22

85. The chief legal advicer of the President of India :

    (A) Comptroller and Auditor General   (B) Chief Justice of Supreme Court

    (C) Attorney General   (D) Division bench of Supreme Court

86. Sarkaria commission related to :

    (A) Minorities rights   (B) River water and Border disputes

    (C) Backward class commission   (D) Centre State relations

87. In 1975 the National Emergency Declaration signed by :

    (A) V.V. Giri   (B) Neelam Sanjeev Reddy

    (C) Zakir Huzzain   (D) Fakhruddin Ali Ahmed

88. Modern states are called "Professional States" called by :

    (A) Norman D Palmer   (B) Rajani Kothari

    (C) S.L. Sikri   (D) Frederic C. Mosher

89. Write the odd one :

    (A) A.B. Vajpayee   (B) Rajeev Gandhi

    (C) ManMohan Singh   (D) Jawaharlal Nehru

90. The youngest person who became the Chief Minister of the State :

    (A) Omar Abdulla   (B) Akhilesh Yadav

    (C) Praphulla Mahanta   (D) Aravind Khejriwal

91. Operation Protective Edge is associated with :
    (A) Egypt
    (B) Israel
    (C) Kuwait
    (D) Afghanistan

92. Bachpan Bachchavo Andolan is founded by :
    (A) Vinobabave
    (B) Baba Amte
    (C) Kailesh Satyarthi
    (D) Aravind Khejriwal

93. Malayali poet known as 'Singing Sword of Kerala' is :
    (A) T.S. Tirumumpu
    (B) Changampuzha
    (C) Kumaranasan
    (D) Vailoppalli

94. The ruler of Travancore who abolished 'Shucheendram Kaimukku' :
    (A) Swati Tirunal
    (B) Utram Tirunal
    (C) Sree Moolam Tirunal
    (D) Sree Visakham Tirunal

95. 'Jeevitha Samaram' is the autobiography of :
    (A) EMS Namboothirippadu
    (B) C. Kesavan
    (C) A.K. Gopalan
    (D) V.T. Bhattathirippad

96. Who was the internal Minister of Kerala in 1957?
    (A) EMS Namboothirippadu
    (B) T.V. Thomas
    (C) V.R. Krishnaiyyer
    (D) K.R. Gouri

97. The real name of Vagvadananta was :
    (A) Kunhiraman
    (B) Kunhikannan
    (C) Damodaran
    (D) Bala Krishnan

98. The editor of the journal 'Mitavadi' was :
    (A) Ramakrishnappilla
    (B) Vakkam Abdul Khader
    (C) C. Krishnan
    (D) T.K. Madhavan

99. Who founded 'Kochi Pulaya Mahasabha'?
    (A) K.P. Karuppan
    (B) Ayyankali
    (C) Sahodaran Ayyappan
    (D) None of these

100. 'Aruvippuram Pratishta' was conducted in the year :
    (A) 1878
    (B) 1887
    (C) 1898
    (D) 1787