Section I

Maximum Marks – 60 **Time – 45 minutes**

Instructions: -

1. There are total 60 question in this section.
2. All question have four choices out of which only one is correct.
3. There is no negative marking.

1. Find the unit place of 3674 x 8596 + 5699 x 1589

a) 3 b) 4

c) 5 d) 6

2. What will be the highest three digit number which when divided by 3, 7 and 21 leaves remainder 2?

a) 978 b) 982

c) 983 d) 989

3. Two persons A & B travelling towards each other from P & Q respectively which is 396 kms apart meet after 11 hours. Speed of A is 6 kms/hr more than B. Find the speed of B.

a) 15 b) 18

c) 21 d) 24

4. Train travelling at a speed of 90 km/hr crosses a man standing on a platform in 8 seconds. Find the time taken by the train to cross the platform of length 250 kms.

a) 15 sec b) 16 sec

c) 18 sec d) 20 sec

5. There are three numbers A, B and C. A is 50% of C and B is 75% of C, then A is what percentage of B?

a) 66.66% b) 50%

c) 75% d) 80%

6. A = 36% B, B = 6% C. If C = 100 then A is equal to –

a) 2.18 b) 2.21

c) 2.16 d) 2.24

7. A shopkeeper purchased two qualities of rice A & B. He bought 10 kg of rice A at Rs.35/kg and 20 kg rice B at Rs. 47/kg. Find the overall cost price per kgs if he mixes both types of rice.

a) 43 b) 42

c) 41 d) 40

8. Sachin has a batting average of 99 in 80 innings. He was out for duck in his 80^{th} innings. If he were to have a batting average of 100 how much should have been scored by him in his 80^{th} match?

a) 80 b) 180

c) 99 d) 100

9. A and B together can complete a particular task in 4 days. If A alone can complete the same task in 6 days, how many days will B take to complete the task if he works alone?

a) 8 b) 7

c) 12 d) None of these

10. If the perimeter of a rectangle is 138 metres and the difference between the length and the breadth is 7 metres, what is the area of the rectangle?

a) 1216 square meters b) 1147 square metres

c) 1184 square metres d) 1178 square metres

11. What will come in place of question mark (?) in the following question?

25% of 84 × 24% of 85 =?

a) 144.4 b) 244.4

c) 428.4 d) 333.4

12. If in a triangle ABC, AB = AC, $\angle A = x + 15°$, $\angle B = 2x + 25°$ then value of $\angle C$

a) 71° b) 51°

c) 61° c) 41°

13. A point P is located outside the circle with centre O. A tangent from point P touches the circle at A and a secant from P cuts the circle at B and C respectively. PA =12cm PC= 16cm. Find the length of chord BC.

a) 12 b) 8

c) 9 d) None of these

14. If $\sin A + \sin^2 A = 1$ then what is the value of $\cos^2 A + \cos^4 A$?

a) 0 b) 1

c) -1 d) 2

15. The length of a rectangular field is increased by 30% and breadth is decreased by 30%. What is the per cent increase or decrease in its area?

a) 9% increase b) 21% decrease

c) 21% increase d) 9% increase

16. If $a + b + c = 9$, $ab + bc + ca = 26$, $a^3 + b^3 = 91$, $b^3 + c^3 = 72$ and $c^3 + a^3 = 35$, then what is the value of abc?

a) 23 b) 24

c) 25 d) 26

17. The value of x for which the expressions 19 - 5x and 19x + 5 become equal is

a) 7/24 b) 7/12

c) 11/12 d) 11/24

18. If $x + y = 10$ and $x^2 + y^2 = 68$, then find xy

a) 18 b) 24

c) 17 d) 16

19. The mode and mean is given by 7 and 8, respectively. Then the median is:

a) 1/13

b) 13/3

c) 23/3

d) 33

20. If Mean of a, a+3, a+6, a+9 and a+12 is 10, then a is equal to;

a) 1

b) 2

c) 3

d) 4

Directions (21 – 25): Below each four pairs of words have been denoted by numbers (a), (b), (c), and (d). Find out which pair of words can be filled up in the blanks in the sentence in the same sequence to make the sentence meaningfully complete.

21. **Mr. Srinivasan is ___ to become Chairman of the group _____ the retirement of his father.**

(a) set, following
(b) voted, subsequent
(c) selected, despite
(d) approved, because

22. **____ to your error the ____ consignment has been delayed by a week.**

(a) According, important
(b) Duly, urgent
(c) Owing, entire
(d) Added, crucial

23. **On account of the ____ in sales the software firm has achieved an eight per cent ____ in net profit.**

(a) surge, fall
(b) increase, rise
(c) decline, slope
(d) hike, loss

24. **We are proud to say that today ___ 26 per cent of our total accoun are ___ by women and senior citizens.**

(a) approximate, held
(b) nearly, authorized
(c) over, maintain
(d) above, open

25. **The company has _____ special training to employees on _____ to trade online.**

(a) announced, benefits
(b) offered, course
(c) imparted, risks
(d) sanction, skills

26. In the following question, out of the four alternatives, select the word similar in meaning to the word given.

Cynicism

a) Conviction
b) Bitterness
c) Credence
d) Intuition

27. In the following question, out of the four alternatives, select the word similar in meaning to the word given.

Pinnacle

a) Culmination
b) Nadir
c) Nethermost
d) Basal

28. In the following question, out of the four alternatives, select the word opposite in meaning to the word given.

Befuddle

a) Baffle
b) Daze
c) Fluster
d) Explicate

29. In the following question, a sentence has been given in Direct/Indirect speech. Out of the four alternatives suggested, select the one which best express the same sentence in Indirect/Direct speech.

John said, "There is a monkey outside the window."

a) John said that there was a monkey outside the window.

b) John said that there is a monkey outside the window.

c) John says that there was a monkey outside the window.

d) John says that there is a monkey outside the window.

30. In the following question, a sentence has been given in Direct/Indirect speech. Out of the four alternatives suggested, select the one which best express the same sentence in Indirect/Direct speech.

She said, "I will have cooked the food by the time they arrive".

a) She said that she will have cooked the food by the time they would arrive.

b) She said that she would cooked the food by the time they will arrive.

c) She said that she would have cooked the food by the time they will arrive.

d) She said that she would have cooked the food by the time they arrived.

In the following question Q31 – Q32, a sentence has been given in Active/Passive Voice. Out of the four alternatives suggested, select the one which best expresses the same sentence in Passive/Active Voice.

31. **You'll be missing the sunshine in home.**

a) You'll miss the sunshine in home.

b) You would be missing the sunshine in home.

c) You'll are going to be missing the sunshine in home.

d) None of the above.

32. **The presiding officer vetoed the committee's decision.**

a) The committee's decision is vetoed by the presiding officer.

b) The committee's decision was vetoed by the presiding officer.

c) The committee's decision has been vetoed by the presiding officer.

d) The committee's decision is being vetoed by the presiding officer.

33. In the following question, out of the four alternatives, select the alternative which best expresses the meaning of the idiom/phrase.

Tight - lipped

a) To have very thin lips

b) To be boisterous

c) To have a thin voice

d) Unwilling to speak about an event

34. Out of the four alternatives, choose the one which can be substituted for the given words/sentence.

To confirm with the help of evidence

a) Philanthropist

b) Bilingual

c) Refute

d) Corroborate

35. In the following question, one part of the sentence may have an error. Find out which part of the sentence has an error and click the button corresponding to it. If the sentence is free from error, click the "No error" option.

Rohan had been playing (1) for his club since fifteen years, (2) but then his elbow got injured. (3) No error (4)

a) Rohan had been playing

b) for his club since fifteen years,

c) but then his elbow got injured.

d) No error

36. When was the Constitution of India amended for the first time?

a) 1951 b) 1952

c) 1950 d) 1953

37. Who wrote the book Indica?

a) Megasthenese
b) Aristotle
c) Chanakya
d) None of these

38. Soil contains decayed remains of living organisms. This is called _____.

a) Minerals
b) Biosphere
c) Saline Soil
d) Humus

39. Dairy comes under which sector of economic activity?

a) Tertiary sector
b) Primary sector
c) Secondary sector
d) Quaternary sector

40. Who is appointed as the first Lt. Governor of Union Territory of Ladakh?

a) Raj Manohar Joshi
b) G C Murmu
c) Satyapal Malik
d) R K Mathur

41. What phenomenon is responsible for twinkling of stars?

a) Diffraction
b) Refraction
c) Dispersion
d) Scattering of Light

42. What will be the power consumption of two 300 W bulbs, three 100 W fans and one 1200 W Refrigerator for continuous operation of 30 hours?

a) 54 kWh
b) 60 kWh
c) 63 kWh
d) None of these

43. What type of image is formed by the eye lens on the retina?

(a) Real and erect
(b) Virtual and inverted
(c) Real and inverted
(d) Virtual and erect

44. The magnetic field is the strongest at

(a) middle of the magnet.
(b) north pole.
(c) south pole.
(d) both poles.

45. The heating element of an electric iron is made up of:

(a) copper
(b) nichrome
(c) aluminium
(d) iron

46. A zygote which has an X-chromosome inherited from the father will develop into

(a) girl
(b) boy
(c) either boy or girl
(d) X-chromosome does not influence the sex of a child.

47. The ability of a cell to divide into several cells during reproduction in Plasmodium is called

(a) budding
(b) multiple fission
(c) binary fission
(d) reduction division

48. Tomato is a natural source of which acid?

(a) Acetic acid
(b) Citric acid
(c) Tartaric acid
(d) Oxalic acid

49. Which of the following has more inertia – a rubber ball and a stone of same size?

a) Rubber ball

b) Stone

c) Both have equal inertia

d) Both have zero

50. A bus at rest starts moving with an acceleration of 0.1 m/s^2. What will be its speed after 2 minutes?

a) 15 m/s

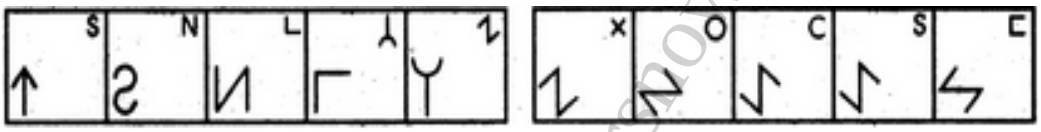
b) 18 m/s

c) 9 m/s

d) 12 m/s

51. Select a figure from amongst the Answer Figures which will continue the same series as established by the five Problem Figures.

Problem Figures: Answer Figures:



A B C D C 1 2 3 4 5

a) 4 b) 3

c) 1 d) 2

52. Marathon is to race as hibernation is to

a) winter b) bear

c) dream d) sleep

53. Choose the correct order of letters which are required to form a correct meaningful word

VARSTE

a) 2,3,1,6,4,5

b) 3,2,4,5,6,1

c) 4,5,2,3,1,6

d) 6,3,4,5,2,1

54. In these series, you will be looking at both the letter pattern and the numbe pattern. Fill the blank in the series.

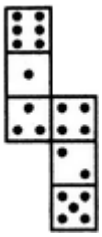
SCD, TEF, UGH, _____, WKL

a) CMN
b) VIJ
c) IJT
d) UJI

55. Introducing a boy, a girl said, "He is the son of the daughter of the father of my uncle." How is the boy related to the girl?

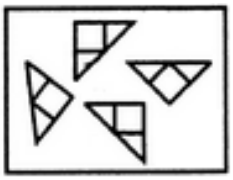
a) Brother
b) Nephew
c) Uncle
d) Son-in-law

56. How many dots lie opposite to the face having three dots, when the given figure is folded to form a cube?

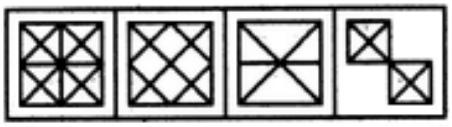


a) 2
b) 3
c) 5
d) 6

57. Find out which of the figures (1), (2), (3) and (4) can be formed from the pieces given in figure (X).



(X)



(1) (2) (3) (4)

a) 2
b) 3
c) 1
d) 4

58. Which of the following diagrams indicates the best relation between Travelers, Train and Bus ?

a) 

b) 

c) 

d) 

59. In a certain code language,

'134' means 'good and tasty';

'478' means 'see good pictures' and

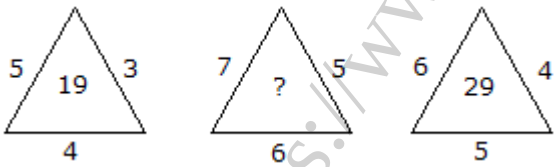
'729' means 'pictures are faint'.

Which of the following digits stands for 'see'?

a) 1 b) 9

c) 8 d) None of these

60. Which one will replace the question mark ?



a) 24 b) 36

c) 29 d) 41

Section II

Maximum Marks – 50 **Time – 30 minutes**

Instructions: -

1. There are total 50 question in this section.
2. All question have four choices out of which only one is correct.
3. There is no negative marking.

1. The value of $\int_0^1 \sqrt{1+\sin\frac{x}{2}}\,dx$ is

(a) 0
(b) 2
(c) 4
(d) None of these

2. The area bounded by the parabola $x=4-y^2$ and y-axis, in square units, is

(a) $\frac{3}{32}$ (b) $\frac{32}{3}$ (c) $\frac{33}{2}$ (d) None of these

3. The general solution of the differential equation $\frac{y\,dx-x\,dy}{y} = 0$, is

(a) $xy = C$ (b) $x = Cy^2$
(c) $y - Cx$ (d) None of these

4. If A, B, C be three sets such that $A \cup B = A \cup C$ and $A \cap B = A \cap C$, then,

(a) B = C
(b) A = C
(c) A = B = C
(d) None of these

5. If $f(x) = e^x$ and $g(x) = \log_e x$ then the value of fog(1) is

(a) 0
(b) 1
(c) -1
(d) None of these

6. The value of $\cos^2 x + \cos^2 y - 2\cos x \times \cos y \times \cos(x + y)$ is

(a) $\sin(x + y)$
(b) $\sin^2(x + y)$
(c) $\sin^3(x + y)$
(d) None of these

7. $1/(1 \cdot 2) + 1/(2 \cdot 3) + 1/(3 \cdot 4) + \ldots\ldots + 1/\{n(n + 1)\}$
(a) $n(n + 1)$
(b) $n/(n + 1)$
(c) $2n/(n + 1)$
(d) None of these

8. if z lies on $|z| = 1$, then $2/z$ lies on
(a) a circle
(b) an ellipse
(c) a straight line
(d) None of these

9. Four dice are rolled. The number of possible outcomes in which at least one dice show 2 is
(a) 1296
(b) 671
(c) 625
(d) None of these

10. If the third term in the binomial expansion of $(1 + x)^m$ is $(-1/8)x^2$ then the rational value of m is
(a) 2
(b) 1/2
(c) 3
(d) None of these

11. Let Tr be the r th term of an A.P., for r = 1, 2, 3, … If for some positive integers m, n, we have Tm = 1/n and Tn = 1/m, then Tm n equals
(a) 1/m n
(b) 1/m + 1/n
(c) 1
(d) None of these

12. The equation of straight line passing through the point (1, 2) and parallel to the line y = 3x + 1 is
(a) y + 2 = x + 1
(b) y + 2 = 3 × (x + 1)
(c) y – 2 = 3 × (x – 1)
(d) None of these

13. The parametric coordinate of any point of the parabola $y^2 = 4ax$ is
(a) $(-at^2, -2at)$
(b) $(-at^2, 2at)$
(c) $(a \sin^2 t, -2a \sin t)$
(d) None of these

14. The coordinate of foot of perpendicular drawn from the point A(1, 0, 3) to th join of the point B(4, 7, 1) and C(3, 5, 3) are
(a) (5/3, 7/3, 17/3)
(b) (5, 7, 17)
(c) (5/3, -7/3, 17/3)
(d) None of these

15. $\text{Lim}_{y\to\infty}\ \{(x + 6)/(x + 1)\}^{(x+4)}$ equals
(a) e
(b) e^3
(c) e^5
(d) None of these

16. Which of the following is not a negation of the statement A natural number is greater than zero
(a) A natural number is not greater than zero
(b) It is false that a natural number is greater than zero
(c) It is false that a natural number is not greater than zero
(d) None of these

17. The median and SD of a distributed are 20 and 4 respectively. If each item is increased by 2, the new median and SD are
(a) 20, 4
(b) 22, 6
(c) 22, 4
(d) None of these

18. If A and B are two events such that $P(a) \neq 0$ and $P(B/A) = 1$, then
(a) $B \subset A$
(b) $B = \varphi$
(c) $A \subset B$
(d) None of these

19. The maximum value of the object function $Z = 5x + 10y$ subject to the constraints $x + 2y \leq 120$, $x + y \geq 60$, $x - 2y \geq 0$, $x \geq 0$, $y \geq 0$ is
(a) 300
(b) 600
(c) 400
(d) None of these

20. Let A be a non-singular matrix of the order 2×2 then $|A^{-1}|=$
(a) $|A|$
(b) $1/|A|$
(c) 0
(d) None of these

21. The area of a triangle with vertices (-3, 0) (3, 0) and (0, k) is 9 sq. units. Th value of k will be
(a) 9
(b) 3
(c) -9
(d) None of these

22. The function f(x) = cot x is discontinuous on the set
(a) {x = nπ, n ∈ Z}
(b) {x = 2nπ, n ∈ Z}
(c) {x = (2n + 1) π2 n ∈ Z}
(d) None of these

23. The area of the region bounded by the curve y = 16−x2−−−−−−√ and x-axis is
(a) 8π sq.units
(b) 20π sq. units
(c) 16π sq. units
(d) None of these

24. If the curve $ay + x^2 = 7$ and $x^3 = y$, cut orthogonally at (1, 1) then the value of a is
(a) 1
(b) 0
(c) 6
(d) None of these

25. Solution of differential equation xdy – ydx = Q represents
(a) a rectangular hyperbola
(b) parabola whose vertex is at origin
(c) straight line passing through origin
(d) None of these

26. Wave picture of light failed to explain.
(a) the photoelectric effect
(b) polarization of light
(c) diffraction of light
(d) None of these

27. A force F is given by $F = at + bt^2$, where t is time. What are the dimensions of a and b?
(a) MLT-1 and MLT0
(b) MLT^{-3} and MLT^{-4}
(c) MLT-4 and MLT1
(d) None of these

28. A body starts from rest and travels for five seconds to make a displacement of 25 m if it has travelled the distance with uniform acceleration a then a is
(a) 3 m/s²
(b) 4 m/s²
(c) 2 m/s²
(d) None of these

29. The path of a particle is given by the expression $y = at + bt^2$, where a and b are constants. Y is the displacement at time t. Its velocity at any instant is given by
(a) a + 2bt
(b) zero
(c) 2bt
(d) None of these

30. A body is sliding down a rough inclined plane which makes an angle of 30 degree with the horizontal. If the coeffcient of friction is 0.26, the acceleration in m/s² is
(a) 1.95
(b) 2.78
(c) 3.47
(d) None of these

31. When the linear momentum of a particle is increased by 1% its kinetic energy increases by x%. When the kinetic energy of the particle is increased by 300%, its linear momentum increases by y%. The ratio of y to x is
(a) 300
(b) 150
(c) 50
(d) None of these

32. If a body is rotating about an axis, passing through its centre of mass then its angular momentum is directed along its
(a) Radius
(b) Tangent
(c) Axis of rotation
(d) None of these

33. The time – period of a satellite of earth is 5 hours. If the separation between the earth and the satellite is increased to 4 times the previous value, the new time – period will become
(a) 10 hours
(b) 20 hours
(c) 40 hours
(d) None of these

34. Hookes law essentially defines
(a) Stress
(b) Strain
(c) Elastic limit
(d) None of these

35. Choose the wrong statement from the following.
(a) Small droplets of a liquid are spherical due to surface tension
(b) Oil rises through the wick due to capillarity
(c) In drinking the cold drinks through a straw, we use the phenomenon of capillarity
(d) None of these

36. A bucket full of hot water is kept in a room and it cools from 75°C to 70°C in t1 minutes from 70°C to 65°C in t2 minutes and from 65°C to 60°C in t3 minutes; then
(a) $t1 - t2 = t3$
(b) $t1 < t2 < t3$
(c) $t1 > t2 > t3$
(d) None of these

37. An engine has an efficiency of 1/6. When the temperature of sink is reduced by 62°C, its efficiency is doubled. Temperature of the source is:
(a) 99°C
(b) 37°C
(c) 62°C
(d) None of these

38. One of the two clocks on the earth is controlled by a pendulum and other by a spring. If both the clocks are taken to the moon, then which clock will have the same time – period of the earth?
(a) spring clock
(b) pendulum clock
(c) both
(d) None of these

39. An observer is moving towards a stationary source of frequency 250 Hz with a velocity of 40 m/s. If the velocity of sound is 330 m/s, the apparent frequency heard by the observer will be
(a) 320 Hz
(b) 300 Hz
(c) 280 Hz
(d) None of these

40. A siren placed at a railway platfrom is emitting sound of frequency 5 kHz. A passenger sitting in a moving train A records a frequency of 5.5 kHz while the train approaches the siren. During his return journey in a different train B he records a frequency of 6.0 kHz while approaching the same siren. The ratio of velocity of train

B to that of train A is
(a) 242 / 252
(b) 2
(c) 5 / 6
(d) None of these

41. Two capacitors of capacitance 6 μF and 4 μF are put in series across a 120 V battery. What is the potential difference across the 4 μF capacitor?
(a) 72 V
(b) 60 V
(c) 48 V
(d) None of these

42. A charged particle of mass m and charge q travels on a circular path of radius r i.e., perpendicular to the magnetic field B. The time taken by particle to complete on revolution is :
(a) 2πqB/m
(b) 2πm/qB
(c) 2πmq/B
(d) None of these

43. The magnetic field strength due to a short bar magnet directed along its axial line at a distance r is B. What is its value at the same distance along the equatorial line?
(a) B
(b) 2/B
(c) B/2
(d) None of these

44. The phase difference b/w the A.C. and e.m.f. is π/2. Which of the following cannot be the instituent of the circuit?
(a) LC
(b) L alone
(c) C alone
(d) None of these

45. A concave mirror of focal length f produces an image n times the size of the object. If the image is real then the distance of the object is:
(a) (n – 1)/ f
(b) (n + 1)/f
(c) (n+1)f/n
(d) None of these

46. The concept of electron spin was introduced by:
(a) Becquerel
(b) Goudsmit

(c) Uhlenbeek and Goudsmit
(d) None of these

47. According to Yukawa's theory of nuclear forces, the origin of nuclear force between nucleons is due to the exchange of
(a) mesons
(b) photons
(c) electrons
(d) None of these

48. To obtain electrons as majority charge carriers in a semiconductor the impurity mixed is:
(a) monovalent
(b) divalent
(c) trivalent
(d) None of these

49. In space communication, the sound waves can be sent from one place to another:
(a) through space
(b) through wires
(c) by superimposing it on undamped electro-magnetic waves
(d) None of these

50. The SI units of electric dipole moment are:
(a) C
(b) Cm^{-1}
(c) Cm
(d) None of these