

Candidate's Roll number

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Booklet Code:

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Time Allowed: 120 Minutes

Total Questions : 100

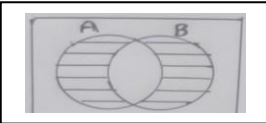
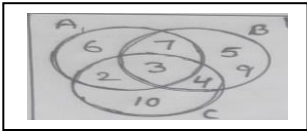
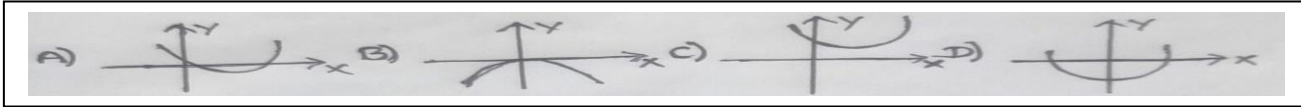
Maximum Marks : 100

Instructions to Candidates

Read the following instructions carefully before you answer the questions. Answers are to be SHADED on a SEPARATE OMR Answer sheet given, with **Black or Blue Ball Point Pen**. Read the **Instructions printed on the OMR sheet carefully before answering the questions.**

- The candidate Roll No. and all other relevant information is printed on the OMR.
- This test consists of 100 questions(Q.Nos. 1 to 50 Mathematics, 51 to 75 Physical Science, 76 to 100 Biological Science).
- Each question carries **one** mark.
- Blank pages are provided for rough work at the end of question paper.
- REMEMBER YOU HAVE TO SHADE ANSWERS ON A SEPARATE OMR ANSWER SHEET PROVIDED**
- Shade the correct answer in the OMR Sheet for the corresponding question.
- The candidate **need not return** this Question Paper booklet and can take it after completion of the examination. No candidate should leave the examination hall before the end of the examination.
- Now turn to the next page and start answering the questions.

MATHEMATICS

- 0.098 can be written as
 A) $49/(2 \times 5)$ B) $49/(2^2 \times 5^3)$ C) $49/(2^3 \times 5^3)$ D) $49/(2^2 \times 5^2)$ []
- If $2\log_{10}4 + 2\log_{10}12 - 2\log_{10}12 = \log_{10}X$, then X=
 A) 0 B) 4 C) 2 D) 1 []
- If $\log_2(x^2-3x) = 2$ then the value of x
 A) 4 B) -1 C) -4 D) Both A and B []
- Set theory was proposed by
 A) Pythagoras B) Euclid C) Cantor D) Hipparchus []
- Match the following
 1) {1,2,3,...,10} P) {x/x is a multiple of 5}
 2) {5,10,15,20,25} Q) {x/x is even natural number less than 32}
 3) {2,3,5,7,9} R) {x/x ∈ N and 1 ≤ x ≤ 10}
 4) {2,4,6,8,10} S) {x/x is a prime number less than 10}
 A) 1-P,2-Q,3-R,4-S B) 1-R,2-P,3-S,4-Q C) 1-S,2-Q,3-P,4-R D) 1-Q,2-R,3-S,4-P []
- Adjacent figure represents
 A) A-B B) B-A
 C) $A \Delta B$ D) All the above
 []
- From the diagram estimate sum of elements in $(A \cup B) \cap C$
 A) 18 B) 12
 C) 9 D) 3
 []
- The curve $y=x^2-5x+6$ passes through
 A) (2,0) B) (8,0) C) (0,3) D) (4,1) []
- The graph of $y=ax^2+bx+c$ so that polynomial ax^2+bx+c has no real roots
 []
- If $p(x) = 2x^2-7x+3$ then $\alpha^2 + \beta^2$
 A) $37/4$ B) $1/4$ C) $4/3$ D) $4/37$ []
- If the system of equations $2x+3y=7$, $(a+b)x + (2a-b)y = 21$ has infinitely many solutions then $a = \underline{\hspace{1cm}}$, $b = \underline{\hspace{1cm}}$
 A) 1,5 B) 5,1 C) -1,5 D) 5,-1 []
- Statement I : Independent pair of linear equations always inconsistent
 Statement II : Independent pair of linear equations have infinitely many solutions
 A) I,II are true B) I,II are false C) I is true, II is false D) I is false, II is true []

13. If $2^x + 3^y = 17$ and $3(2^x) - 2(3^y) = 6$ then []
 A) $x=2, y=3$ B) $x=-2, y=3$ C) $x=-2, y=3$ D) $x=3, y=2$
14. A fraction in the form a/b becomes equal to $6/5$, if 2 is added to both numerator and Denominator fraction becomes $3/2$ the $a/b =$ []
 A) $3/4$ B) $4/3$ C) $7/5$ D) $10/8$
15. The roots of the equation $3x^2 - 2\sqrt{6}x + 2 = 0$ are []
 A) $2/\sqrt{3}, -2/\sqrt{3}$ B) $1/\sqrt{3}, -1/\sqrt{3}$ C) $\sqrt{2}/3, \sqrt{2}/3$ D) $1/\sqrt{3}, 5/\sqrt{3}$
16. If α, β are the roots of $x^2 - px + 36 = 0$ such that $\alpha^2 + \beta^2 = 9$ then $p =$ []
 A) ± 9 B) 6 C) -6 D) 3
17. If $2 + \sqrt{3}$ and $2 - \sqrt{3}$ are the roots of quadratic equation, then the quadratic equation is []
 A) $x^2 + 4x + 1 = 0$ B) $x^2 + 4x - 1 = 0$ C) $x^2 - 4x - 1 = 0$ D) $x^2 - 4x + 1 = 0$
18. If $1/(x+2), 1/(x+3), 1/(x+5)$ are in A.P then $x =$ []
 A) 0 B) 1 C) 2 D) -1
19. -9, -14, -19, ... are in A.P then find the value of $a_{30} - a_{20}$ []
 A) -35 B) -50 C) -55 D) -65
20. How many numbers of two digits divisible by 7 ? []
 A) 13 B) 15 C) 12 D) 14
21. If ka^a, kb^b, kc^c are in G.P then a, b, c are in []
 A) G.P B) A.P C) H.P D) Both A and B
22. If $x > 0, y < 0$ then the point $(-x, y)$ lies in []
 A) Q_1 B) Q_2 C) Q_3 D) Q_4
23. The distance between the points $(5 \cos 35^\circ, 0)$ and $(0, 5 \cos 55^\circ)$ is [] units
 A) 25 B) 5 C) 1 D) 6
24. The slope of the line $x/a + y/b = 1$ is []
 A) $-b/a$ B) $-a/b$ C) 1 D) -1
25. The centroid of the triangle formed by the line $x+y=8$ with coordinate axes is []
 A) (2,2) B) (4,4) C) $(8/3, 8/3)$ D) (8,8)
26. In the figure $AB \parallel CD$ the $x =$ []
 A) 2
 B) 4
 C) 2
 D) 7
-
27. In ΔPQR , $PQ = 6\sqrt{3}$ cm, $PR = 12$ cm and $QR = 6$ cm then $\angle Q =$ []
 A) 30° B) 45° C) 90° D) 60°
28. Two _____ are always similar []
 A) Circles B) Triangles C) Trapeziums D) All of these
29. From the adjacent figure, which of the following is true? []
 A) $\Delta ABC = 2/3 \Delta A^1B^1C^1$
 B) $\Delta A^1B^1C^1 = 2/3 \Delta ABC$
 C) $\Delta A^1B^1C^1 = 3/2 \Delta ABC$
 D) All the above
-
30. In the figure, if $\angle APB = 60^\circ$ and $OP = 10$ cm, then $PA =$ []
 A) 5 cm
 B) $5\sqrt{2}$ cm
 C) $5\sqrt{3}$ cm
 D) 20 cm
-
31. The angle made by the minutes hand in a clock during a period of 20 minutes is []
 A) 120° B) 20° C) 360° D) 90°
32. OACB is a quadrant of a circle with centre 'O' and radius 3.5 cm. If $OD = 2$ cm, then the area of shaded region []
 A) 5.5 cm^2 B) 6.125 cm^2
 C) 7.15 cm^2 D) 5.25 cm^2
-
33. If the two circular cylinders of equal volume have their heights in the ratio 1:2 then ratio of their radii is []
 A) $\sqrt{2}:1$ B) $1:\sqrt{2}$ C) 1:2 D) 2:1
34. Match the following []
 1) Ice cream is combination of P) Frustum of cone and cylinder
 2) A cylindrical pencil is Q) Hemisphere, Cone
 3) A shuttle cock is R) Cone, Cylinder
 4) A funnel is combination of S) Cone, Hemisphere

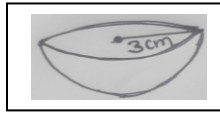
A) 1-Q,2-P,3-S,4-R B) 1-Q,2-R,3-S,4-P C) 1-S,2-R,3-P,4-Q D) 1-S,2-R,3-Q,4-P

35. Ratio of volumes of cone, a cylinder and a hemisphere of same base, radius and equal height is []

- A) 1:2:3 B) 3:2:1 C) 3:1:2 D) 1:3:2

36. The value of the solid in the given figure is []

- A) $8\pi \text{ cm}^3$ B) $18\pi \text{ cm}^3$
C) $10\pi \text{ cm}^3$ D) $15\pi \text{ cm}^3$



37. The value of $\sin^2 29^\circ + \sin^2 61^\circ$ []

- A) 1 B) 0 C) $2\sin^2 29^\circ$ D) $2\cos^2 61^\circ$

38. If $\cos \theta = \frac{2\sqrt{m}\sqrt{n}}{m+n}$ then $\sin \theta =$ []

- A) $\frac{m+n}{m-n}$ B) $\frac{m-n}{m+n}$ C) $\frac{2\sqrt{m}\sqrt{n}}{m+n}$ D) $\frac{m+n}{mn}$

39. If $x = a \cos \theta$, $y = b \sec \theta$ then []

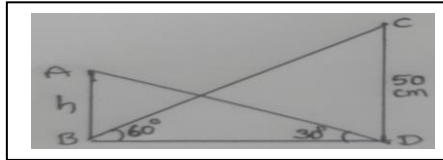
- A) $xy = a^2 b^2$ B) $x^2 y^2 = ab$ C) $x^2 y^2 = a^2 b^2$ D) $xy = a^2/b^2$

40. The value of $\tan 1^\circ \times \tan 2^\circ \times \tan 3^\circ \times \dots \times \tan 89^\circ$ []

- A) 0 B) 1 C) -1 D) $\sqrt{3}$

41. From the adjacent figure $h =$ []

- A) $50/\sqrt{3}$ m
B) $50\sqrt{3}$ m
C) $50/3$ m
D) 150 m

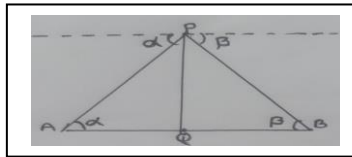


42. The ratio of the lengths of a tree and its shadow is $1:1/\sqrt{3}$ then the angle of sun's elevation is []

- A) 30° B) 45° C) 60° D) 90°

43. From the adjacent figure $h =$ []

- A) $\frac{\tan \alpha - \tan \beta}{\tan \alpha + \tan \beta}$
B) $\frac{\tan \alpha + \tan \beta}{\tan \alpha - \tan \beta}$
C) $\frac{\tan \alpha - \tan \beta}{\tan \alpha - \tan \beta}$
D) $\frac{\cot \alpha + \cot \beta}{\cot \alpha - \cot \beta}$



44. From the letters of word "MOBILE" a letter is selected then the probability that the letter is a vowel []

- A) $1/3$ B) $3/7$ C) $1/6$ D) $1/2$

45. If two dice are rolled at a time, then the probability that the two faces show different numbers []

- A) $1/6$ B) $35/36$ C) $5/6$ D) $1/36$

46. Among the given, which does not represent the probability of an event? []

- A) 0.3 B) $1/3$ C) $7/5$ D) 40%

47. The mode of $\log_2 8$, $\log_3 27$, $\log_{10} 100$, $\log_5 5$, $\log_4 64$ is []

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

48. The mean of first 7 odd multiples of 3 is []

- A) 9 B) 15 C) 21 D) 27

49. Pie diagrams consists of []

- A) circles B) sectors C) rectangles D) triangles

50. Statement I : Median can be graphically determined from ogive curves []

Statement II: Mean is effected by extreme values

- A) I, II are true B) I,II are false C) only I is true D) only II is true

R.A. GANAPATHI RAO

SPSMCH SCHOOL

LBS NAGAR

VIJAYAWADA

PHYSICAL SCIENCE

51. The quantity of heat energy required to raise the temperature of 1 kg of water by 1°C is []

- A) 1 J B) 1 cal C) 1 K.cal D) 41.86 J

52. If two substances of masses m_1, m_2 ; specific heats S_1, S_2 at initial temperatures T_1 and T_2 are Mixed, then the final temperature of a mixture is []

- A) $\frac{m_1 T_1 + m_2 T_2}{m_1 + m_2}$ B) $\frac{m_1 T_1 - m_2 T_2}{m_1 + m_2}$ C) $\frac{m_1 S_1 T_1 + m_2 S_2 T_2}{m_1 S_1 + m_2 S_2}$ D) $\frac{m_1 S_1 T_1 + m_2 S_2 T_2}{m_1 + m_2}$

53. Slaked lime + Water + Carbon dioxide \rightarrow X []

The chemical formula of the product X is

- A) CaCl_2 B) CaCO_3 C) $\text{Ca}(\text{HCO}_3)_2$ D) $\text{Ca}(\text{OH})_2$

54. Which of the following is not a base? []

- a) HCOOH b) $\text{C}_6\text{H}_{12}\text{O}_6$ c) $\text{C}_2\text{H}_5\text{OH}$ d) NaOH

- A) only a B) a and b C) a,b and c D) a,b,c and d

55. The refractive indices of four materials P,Q,R and S are 1.33, 1.44, 1.77 and 1.50 respectively. []

The speed of the light is minimum in the substance

- A) P B) Q C) R D) S

56. $n_1 = 3/2$, $n_2 = 4/3$ so critical angle of denser medium []

- A) $\sin^{-1}(9/8)$ B) $\sin^{-1}(4/9)$ C) $\sin^{-1}(8/9)$ D) $\sin^{-1}(8/17)$

57. A bird is flying down vertically towards the surface of water in a pond with constant speed. There is a fish inside the water. If the fish is exactly vertically below the bird, then the bird will appear to the fish to be

- i) Farther away than its actual distance ii) Closer than its actual distance
 iii) Moving faster than its actual speed iv) Moving slower than its actual speed

Which of the above options are true

- A) only i B) i and iii C) i and iv D) ii and iv

58. An object is placed at the following distance from a convex lens of focal length 20cm.

Match the following

Object distance

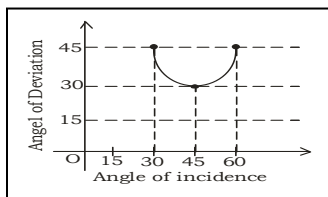
- 1) 60 cm
 2) 40 cm
 3) 30 cm
 4) 10 cm

Nature of the image

- P) Real and same size of the object
 Q) Real and magnified image
 R) Virtual and magnified image
 S) Real and diminished image

- A) 1-P,2-Q,3-R,4-S B) 1-S,2-P,3-Q,4-R C) 1-R,2-S,3-Q,4-P D) 1-R,2-S,3-P,4-Q

59. Find angle of glass prism from the graph



- A) 30° B) 45° C) 60° D) 90°

60. Assertion(A): The refractive index of a prism depends only on the kind of a glass which is made of and colour of the light

Reason(R): The refractive index of a prism depends on the refracting angle of a prism and the angle of minimum deviation.

- A) A and R are true, R is correct explanation of A B) A is true but R is false
 C) A and R are true, R is not correct explanation of A D) A is false but R is true

61. The n and l values for electron in 4d orbital is

- A) $n=3, l=2$ B) $n=4, l=0$ C) $n=4, l=1$ D) $n=4, l=2$

62. The maximum number of electrons that can be filled in 3d orbital is

- A) 3 B) 6 C) 10 D) 14

63. Assertion(A): The ionization energy of oxygen is less than Nitrogen

Reason(R): Nitrogen has stable half filled electronic configuration

- A) Both A and R are correct and R is correct explanation of A
 B) Both A and R are correct and R is not correct explanation of A
 C) A is correct, R is incorrect D) A is incorrect, R is correct

64. The correct order of size

- A) $\text{Na}^+ < \text{Mg}^{+2} < \text{Al}^{+3}$ B) $\text{Mg}^{+2} < \text{Na}^+ < \text{Al}^{+3}$ C) $\text{Al}^{+3} < \text{Mg}^{+2} < \text{Na}^+$ D) $\text{Mg}^{+2} < \text{Al}^{+3} < \text{Na}^+$

65. Which of the following has Neon Configuration?

- i) Na^+ ii) Mg^{+2} iii) F^- iv) O^{-2}

- A) only i B) i and ii C) i, ii and iii D) i, ii, iii and iv

66. Match the following

- X) ionic bond P) Cl_2
 Y) covalent bond Q) HCl
 Z) polar covalent bond R) NaCl

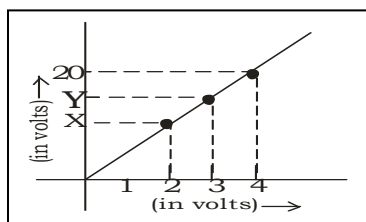
- A) X-P,Y-Q,Z-R B) X-R,Y-P,Z-Q C) X-R,Y-Q,Z-P D) X-Q,Y-R,Z-P

67. The resistors of values x and $x/2$ are connected in parallel combination. Effective resistance

- A) $\frac{x}{3} \Omega$ B) $\frac{3}{x} \Omega$ C) $\frac{3x}{2} \Omega$ D) $\frac{2x}{3} \Omega$

68. The V-I graph of two conductors are shown in the figure. Find the value of $(x+y)$

- A) 15 V
 B) 10 V
 C) 80 V
 D) 25 V



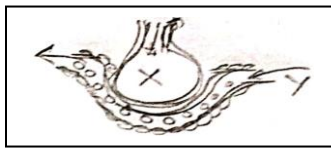
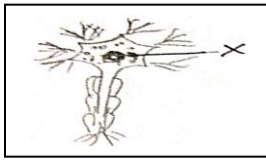
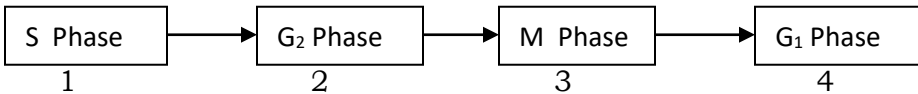
69. The Scientist who discovered the magnetic effect of current

- A) Oersted B) Faraday C) Ampere D) Fleming

70. 1Tesla = _____

- A) 1 weber B) 1 weber/metre² C) 1 watt/metre² D) 1 coloumb
71. The law which states an induced current will appear in such direction that it opposes the changes in the flux in the coil is []
 A) Ampere law B) Lenz's law C) Ohms's law D) Faraday's law
72. The formula of Bauxite ore is []
 A) Al₂O₃.2H₂O B) Fe₂O₃ C) ZnO D) HgO
73. X: The method is used for the concentration of galena is froth floatation
 Y: Froth floatation is used for concentration of oxide ore
 Choose the correct statement []
 A) X and Y are correct B) X and Y are incorrect
 C) X is correct, Y is incorrect D) X is incorrect, Y is correct
74. The IUPAC name of CH₃-CH(OH)-CH₂-COOH is []
 A) 2-hydroxy-butan-1-oic acid B) 3-hydroxy-butan-1-oic acid
 C) 4-hydroxy-butan-2-oic acid D) 3-hydroxy-butan-2-oic acid
75. The formula of compound is C₃H₄. What is the formula of the next compound in homologous series []
 A) C₄H₈ B) C₅H₈ C) C₄H₆ D) C₄H₁₀

BIOLOGICAL SCIENCE

76. In single celled animals, the food is taken by []
 A) The entire body surface B) Mouth C) Teeth D) vacuoles
77. Iodine can be used to test the presence of []
 A) Glucose B) Light C) Starch D) CO₂
78. The % of carbon dioxide in exhaled air []
 A) 0.04 B) 0.03 C) 44 D) 5
79. What is the life span of R.B.C []
 A) 120 days B) 130 days C) 140 days D) 100 days
80. Label the parts X and Y in given diagram []
 A) CO₂, capillary network
 B) Alveolus, CO₂
 C) O₂, CO₂
 D) Blood cell, CO₂
- 
81. Which vitamin is useful in coagulation of blood? []
 A) Vitamin B B) Vitamin K C) Vitamin E D) Vitamin A
82. Rama's heart beat is 72 times per minutes, so her pulse rate is []
 A) More than 72/min B) Less than 72/min C) Exactly 72/min D) Cannot give
83. The structural and functional unit of human kidney is called []
 A) Neuron B) Nephron C) Nephridia D) Flame cell
84. Alkaloid quinine is used as []
 A) Insecticide B) Pain killer C) Anti malarial drug D) Sedative
85. Leaf movement in mimosa helps to []
 A) Reduce photosynthesis B) Protect from grazers C) Reduce phytoharnones D) Regulate its growth
86. Diabetes is related to this gland in humans []
 A) Thyroid B) Pituitary C) Pancreas D) Adrenal
87. Menstrual cycle in female is under the control of this hormone []
 A) Adrenalin B) Oestrogen C) Progesterone D) Thyroxine
88. In the given diagram 'X' denotes []

 A) Schwann cells
 B) Nodes of Ranvir
 C) Axon terminal
 D) Nissal's granules
89. Arrange the stages of cell cycle of Mitosis in correct order []

 A) 4,1,2,3 B) 2,3,4,1 C) 4,2,3,1 D) 1,3,4,2
90. This symbol denotes []
 A) World Aids Day
 B) World Doctors Day
 C) World Health Day
 D) World Red Cross Day
- 