10

CREATIVE - MCQ

10TH MATHEMATICS

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Unit-1: RELATIONS & FUNCTIONS

1. The function $f: N \dashrightarrow R$ is defined by $f(x) = 2^n$. The range of the function is
   (1) The set of all even positive integers (2) N (3) R
   (4) a subset of all even positive integers

2. Let f be a function $f: N \to N$ be defined by $f(x) = 3x + 2,\ x \in N$. The preimage of 29 is
   (1) 89 (2) 87 (3) 9 (4) $\frac{31}{3}$

3. If $\{(7, 11), (5, a), (3, b)\}$ represents a constant function then (a, b) is
   (1) (5, 3) (2) (3, 5) (3) (11, 11) (4) (7, 7)

4. The domain of a function $f(x) = \frac{1}{x(x+1)}$
   (1) $\{0, -1\}$ (2) $R - \{0, -1\}$ (3) $R - \{0\}$ (4) $R - \{-1\}$

5. If $A \times B = \{(3, 2), (3, 4), (5, 2), (5, 4)\}$ then A is
   (1) $\{3, 5\}$ (2) $\{2, 4\}$ (3) $\{2, 3, 4, 5\}$ (4) $\{\}$

6. If $f(x) = x^2 - x$ then $f(x - 1) - f(x + 1)$ is ----------
   (1) $4x$ (2) $4x + 2$ (3) $2 - 4x$ (4) $4x - 2$

7. If $f(x) = \frac{1}{x}$ and $g(x) = -\frac{1}{x}$ then $f \circ g = ?$
   (1) $-x$ (2) $\frac{1}{x}$ (3) $-\frac{1}{x}$ (4) x

8. If there are 28 relations from a set A= $\{2, 4, 6, 8\}$ to a set B, then the number of elements in B is
   (1) 7 (2) 14 (3) 5 (4) 4

9. A function $f: A \to B$ is said to be a bijective function if f is ---------- function
   (1) one-one but not onto (2) onto but not one – one
   (3) both one – one and onto (4) one – one and into

10. Composition of functions is associative (1) Always true (2) Never true
    (3) Sometimes true (4) Not defined

11. If $55 \equiv k\ (mod\ 11)$ then the value of k is
(1) 0 (2) 5 (3) 10 (4) 11

12. The pth term of an AP is $\frac{3p-1}{6}$. The sum of the first n terms of the AP is
(1) $n(3n+1)$ (2) $\frac{n(3n+1)}{12}$ (3) $\frac{n(3n-1)}{12}$ (4) $n(3n-1)$

13. If m, p, q are consecutive terms in an A.P. then p is ----------
(1) $\frac{mq}{2}$ (2) $\frac{m-q}{2}$ (3) $\frac{m^2+q^2}{2}$ (4) $\frac{m+q}{2}$

14. When $x = 2$, the value of $1 + x + x^2 + \cdots + x^9$ is
(1) 511 (2) 1023 (3) 513 (4) 1025

15. The sequence $a_n = 2n + 1$ is an A.P. then the common difference is ----------
(1) 5 (2) 7 (3) 3 (4) 2

16. Common ratio of the G.P., $\sqrt{2}, \frac{1}{\sqrt{2}}, \frac{1}{2\sqrt{2}}, \ldots$ is
(1) $\frac{1}{\sqrt{2}}$ (2) $\sqrt{2}$ (3) 2 (4) $\frac{1}{2}$

17. Number of multiples of 7 between 100 and 300 is
(1) 21 (2) 24 (3) 28 (4) 35

18. $a_n = \begin{cases} n^2 \ if\ n\ is\ odd \\ 2n \ if\ n\ is\ even \end{cases}$ a_5 and a_6 are...
(1) 25, 24 (2) 25, 10 (3) 25, 12 (4) 36, 12

19. The n^{th} term of the sequence $\frac{1}{2}, \frac{3}{4}, \frac{5}{6}, \frac{7}{8}$ .... Is
(1) $1 + \frac{1}{2n}$ (2) $1 - \frac{1}{2n}$ (3) $1 - \frac{1}{n+2}$ (4) $\frac{n-1}{n+2}$

20. The sequence $\sqrt{11}, \sqrt{55}, 5\sqrt{11}, 5\sqrt{55}, 25\sqrt{11}$ .... is
(1) A.P. (2) G.P. (3) both A.P. and G.P. (4) neither A.P. nor G.P

21. If $t_1 = n,\ t_2 = n + 1,\ t_3 = n + 2$ and so on then $t_n = ?$
(1) n (2) $2n - 1$ (3) $2n + 1$ (4) $2n$

22. The series of the sequence $a_n = 1 + (-1)^n$ is ....
(1) 0+2+0+2+... (2) 2+2+2+... (3) 1+1+1+1+... (4) $1 - 1 + 1 - 1 + \cdots$

23. First term of the G.P. is 1. The sum of 3rd and 5th term is 90 then the common ratio is .....
(1) ± 10 (2) ± 9 (3) ± 5 (4) ± 3

24. The value of x such that $8x + 4,\ 6x - 2$ and $2x + 7$ will form an AP is
(1) 15 (2) 2 (3) $\frac{15}{2}$ (4) 1

25. 10th term of an A.P. is 52, 16th term is 82, then its n^{th} term is..
(1) $n + 2$ (2) $5n - 2$ (3) $5n + 2$ (4) $5n$

Unit-3: ALGEBRA

26. Solution of $\frac{1}{x}+\frac{1}{y}=2$ and $\frac{1}{x}-\frac{1}{y}=4$ is ....
(1) $x=\frac{1}{3},\ y=-1$ (2) $x=\frac{1}{3},\ y=3$ (3) $x=3,\ y=\frac{1}{3}$ (4) $x=\frac{1}{3},\ y=\frac{1}{3}$

27. The LCM of $2^k,\ 2^{k+1}, 2^{k+5}$ where $k \in N$ is
(1) 2 (2) 2^k (3) 2^{k+1} (4) 2^{k+5}

28. $\frac{a^2}{a^2-b^2}+\frac{b^2}{b^2-a^2}=?$ (1) $a-b$ (2) $a+b$ (3) a^2-b^2 (4) 1

29. The area of rectangle is $\frac{(x-4)(x+3)}{3x-12}$ and the length is $\left(\frac{x-3}{3}\right)$. Its breadth is .....
(1) $\frac{x-3}{x+3}$ (2) $\frac{x+3}{x-3}$ (3) 1 (4) 3

30. Square root of $16x^2+9y^2-24xy+24x-18y+9$ is
(1) $|4x-3y+3|$ (2) $|4x+3y-3|$ (3) $|4x+3y+3|$ (4) $|4x-3y-3|$

31. If $\frac{9}{y}+\frac{4}{x}=\frac{12}{\sqrt{xy}}$, where $x>0,\ y>0$, then $3\sqrt{x}-2\sqrt{y}=$
(1) 3 (2) 2 (3) 5 (4) 0

32. If one root of the equation $3x^2-10x+k=0$ is $\frac{1}{3}$ then the value of k is
(1) $\frac{1}{3}$ (2) -3 (3) 3 (4) $-\frac{1}{3}$

33. If $\alpha+\beta=14$ and $\alpha-\beta=2\sqrt{3}$ then $\alpha\beta=$
(1) 42 (2) 44 (3) 46 (4) 48

34. LCM of $6x^2y,\ 9x^2yz^3,\ 12x^2y^2z$ is
(1) $36xy^2z^2$ (2) $26\,x^2y^2z$ (3) $36\,x^2y^2z^3$ (4) $36xy^2z$

35. The value of $\sqrt{(1-x)^2(2-x)^2(3-x)^2}$ when $x=4$ is
(1) 3 (2) -3 (3) 6 (4) -6

36. What should be added to $x(x+14)$, so that the resulting quadratic polynomial becomes a perfect square (1) 14 (2) 7 (3) $\sqrt{7}$ (4) 49

37. If α and α^2 are the roots of the equation $x^2-bx+8=0$, then the value of b is
(1) 2 (2) 4 (3) 6 (4) 8

38. If the order of matrix A is 3×4 and the order of B is 5×3 then the order of the transpose of a product matrix BA is (1) 4×3 (2) 4×5 (3) 5×4 (4) 3×3

39. If $(-1\quad -2\quad 4)\begin{pmatrix}2\\ a\\ -3\end{pmatrix}=(-10)$ then the value of a is
(1) 2 (2) -4 (3) 4 (4) -2

40. If $A = [a_{ij}]_{2\times 2}$ and $a_{ij} = i + j$ then $A = ?$

(1) $\begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix}$ (2) $\begin{pmatrix} 2 & 3 \\ 3 & 4 \end{pmatrix}$ (3) $\begin{pmatrix} 2 & 3 \\ 4 & 5 \end{pmatrix}$ (4) $\begin{pmatrix} 4 & 5 \\ 6 & 7 \end{pmatrix}$

41. $A = \begin{pmatrix} 4 & -2 \\ 6 & -3 \end{pmatrix}$ then $A^2 = ?$

(1) $\begin{pmatrix} 16 & 4 \\ 36 & 9 \end{pmatrix}$ (2) $\begin{pmatrix} 8 & -4 \\ 12 & -6 \end{pmatrix}$ (3) $\begin{pmatrix} -4 & 2 \\ -6 & 3 \end{pmatrix}$ (4) $\begin{pmatrix} 4 & -2 \\ 6 & -3 \end{pmatrix}$

42. $A = (1 \ -2 \ 3)$, $B = \begin{pmatrix} -1 \\ 2 \\ -3 \end{pmatrix}$ then $A + B^T = ?$

(1) $(0 \ 0 \ 0)$ (2) $\begin{pmatrix} 0 \\ 0 \\ 0 \end{pmatrix}$ (3) $(2 \ 4 \ 6)$ (4) not defined

43. $A \times \begin{pmatrix} 2 \\ 3 \\ 6 \end{pmatrix} = \begin{pmatrix} 11 \\ 13 \end{pmatrix}$ then the order of matrix A is

(1) 3×2 (2) 2×3 (3) 3×1 (4) 2×1

44. $\begin{pmatrix} 1 & 1 & 0 \\ 1 & 1 & 0 \\ 1 & 0 & 1 \end{pmatrix}$ is a ----------

(1) Unit matrix (2) scalar matrix (3) square matrix (4) diagonal matrix

45. $\begin{pmatrix} x+y & x-y \\ 8 & 5 \end{pmatrix} = \begin{pmatrix} 8 & 2 \\ 8 & z \end{pmatrix}$ then x, y, z are

(1) 5, 3, 5 (2) 6, 2, 5 (3) 5, −2, 5 (4) 5, −3, 5

Unit-4: GEOMETRY

46. In ΔABC, $DE \parallel AB$ and $AD : DC = 3 : 2$. Then (area of ΔABC) : (area of ΔDEC) = ?

(1) 4 : 25 (2) 4 : 9 (3) 9 : 4 (4) 25 : 4

47. If ΔABC is an isosceles, right triangle with $\angle C = 90°$ then

(1) $AB^2 = 2AC^2$ (2) $AC^2 = 2AB^2$ (3) $BC^2 = 2AC^2$ (4) $AC^2 = 2BC^2$

48. If $\Delta ABC \sim \Delta PQR$ and Area of $\Delta PQR = 4$ (Area of ΔABC) then AB : PQ is

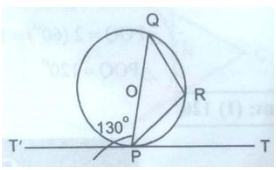
(1) 2 : 1 (2) 4 : 1 (3) 1 : 2 (4) 1 : 4

49. In ΔABC, $AB = 6$ cm and AD is the angle bisector of $\angle A$. If $BD : DC = 3 : 2$ then $AC = ?$

(1) 4 cm (2) 6 cm (3) 2 cm (4) 8 cm

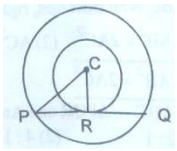
50. In the figure, T'PT is tangent to the circle at P. If $\angle QPT' = 130°$ then $\angle PRQ = ?$

(1) 65° (2) 50° (3) 130° (4) 40°



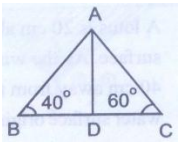
51. In ΔABC, $DE \parallel BC$ meeting AB and AC at D and E. If $AD = 3$ cm, $DB = 2$cm and $AE = 2.7$cm, then AC=?
(1) 1.8 cm (2) 4.5 cm (3) 3.5 cm (4) 5.5 cm

52. In the figure, C is the centre of the concentric circles, the chord PQ touches smaller circle of radius 3 cm at R. If PQ = 8cm then the radius of larger circle is
(1) 3 cm (2) 4 cm (3) 5 cm (4) 2 cm



53. If the tangents PA and PB from an external point P to circle with centre O are inclined each other at an angle of $40°$ from $\angle POA = ?$
(1) $70°$ (2) $80°$ (3) $50°$ (4) $60°$

54. In the figure, $\frac{AB}{AC} = \frac{BD}{DC}$, $\angle B = 40°$ and $\angle C = 60°$ then $\angle BAD = ?$
(1) $30°$ (2) $50°$ (3) $80°$ (4) $40°$



55. If a vertical stick 12 m long casts a shadow 8 m long on the ground and at the same time a tower casts a shadow 40m long on the ground, then the height of the tower is....
(1) 40m (2) 50 m (3) 75 m (4) 60m

Unit-5: COORDINATE GEOMETRY

56. If $(x, 2)$ is the midpoint of the line segment joining $(3, 4)$ and $(1, y)$ then the value of x and y are respectively (1) $1, 2$ (2) $2, 0$ (3) $2, -2$ (4) $1, -2$

57. The area of the triangle formed by the points $(0, 0)$ $\left(\frac{46}{7}, 0\right)$ and $\left(0, \frac{21}{23}\right)$ is ...
(1) 6 units (2) 2 units (3) 3 units (4) 4 units

58. The angle between the line $x = y$ and $\sqrt{3}\,x - y = 0$ is
(1) $15°$ (2) $30°$ (3) $60°$ (4) $90°$

59. The equation of the straight line whose x and y intercepts are 2 and 3 respectively is
(1) $2x + 3y = 6$ (2) $3x + 2y = 6$ (3) $2x + 3y = 0$ (4) $3x + 2y = 0$

60. The centre of a circle is at $(3, 4)$. If the circle touches the x – axis, then the radius of the circle is
(1) 3 units (2) 4 units (3) 5 units (4) 7 units

61. The area of a quadrilateral formed by the points $(-1, 1), (1, 1), (1, -1)$ and $(-1, -1)$ is..
(1) zero (2) 4 sq. units (3) 25 sq. units (4) 1 sq. unit

62. If $(5, 7), (3, a)$ and $(6, 6)$ are collinear, then the value of a is
(1) 3 (2) 6 (3) 9 (4) 12

63. The vertices of a triangle are $A(3,-5)$, $B(-2,1)$ and $C(0,-1)$, then the slope of the altitude through A us (1) $\frac{1}{2}$ (2) -2 (3) 1 (4) -1

64. The equation of a line passing through the origin and perpendicular to the line $2x+3y-7=0$ is
(1) $2x+3y=0$ (2) $3x-2y=0$ (3) $y+5=0$ (4) $y-5=0$

65. The x intercept of the line $2x-y=10$ is
(1) 5 (2) 10 (3) -10 (4) not defined

Unit-6: TRIGONOMETRY

66. $\frac{\sqrt{1-sin^2\theta}}{\sin\theta}$ =? (1) $cot\theta$ (2) $\frac{sin\theta}{2}$ (3) $tan\theta$ (4) 1

67. If $tan\theta+cot\theta=2$, then $tan^2\theta+cot^2\theta=?$
(1) 0 (2) 1 (3) 2 (4) 4

68. If $cot\theta=\frac{x}{a}$ then $\frac{x}{\sqrt{a^2+x^2}}=?$
(1) $cos\theta$ (2) $sin\,\theta$ (3) $cosec\,\theta$ (4) $sec\,\theta$

69. The shadow of a pillar of height 5 m is 5 m. The angle of elevation is
(1) 90° (2) 45° (3) 60° (4) 30°

70. If $cosec\,A-cot\,A=5$, then $cosec\,A+cotA=?$
(1) -5 (2) 5 (3) $\frac{1}{5}$ (4) $-\frac{1}{5}$

71. $\frac{1}{1+sin\theta}+\frac{1}{1-sin\theta}=?$ (1) $2cos^2\theta$ (2) $2sec^2\theta$ (3) $\frac{1}{2}cos^2\theta$ (4) $\frac{1}{2}sec^2\theta$

72. $\frac{\sin\theta-sin^3\theta}{\cos\theta-cos^3\theta}=?$ (1) $tan^2\theta$ (2) $cot^2\theta$ (3) $\tan\theta$ (4) $\cot\theta$

73. $sin^2 20°+sin^2 70°-tan\,45°=?$ (1) 1 (2) 0 (3) 2 (4) -1

74. A ladder leaning against a vertical wall, makes an angle 60° with the ground. The foot of the ladder is 3.5 m away from the wall. The length of the ladder is...
(1) $3.5\sqrt{3}$ m (2) 3.5 m (3) 7 m (4) $3.5\sqrt{2}$ m

75. The angular elevation of the sun when the length of the shadow of a 30 m long pole is $10\sqrt{3}$ m is
(1) 30° (2) 60° (3) 90° (4) 45°

Unit-7: MENSURATION

76. If two cylinders have their radii in the ratio 4 : 5 and heights are in the ratio 5 : 6 then the ratio of their volumes is ... (1) 8 : 15 (2) 15 : 8 (3) 6 : 5 (4) 4 : 5

77. A child reshapes a cone made up of China clay of height $24\ cm$ and radius $6\ cm$ into a sphere. The radius of the sphere is... (1) $24\ cm$ (2) $12\ cm$ (3) $6\ cm$ (4) $48\ cm$

78. The ratio of the volume of a cube to that of a sphere which exactly fits into the cube is...
(1) $\pi : 1$ (2) $4 : 3$ (3) $6 : \pi$ (4) $\pi : 6$

79. If a rectangle of length $44\ cm$ and breadth $4\ cm$ is folded by bringing their breadth together to form a cylinder then the height of the cylinder thus formed is
(1) $44\ cm$ (2) $22\ cm$ (3) $7\ cm$ (4) $4\ cm$

80. A cylindrical tank has a capacity of $6160\ m^3$. The diameter of the base is $28\ m$. Then the depth is
(1) $10\ m$ (2) $5\ m$ (3) $20\ m$ (4) $15\ m$

81. The volume of a cone is ---------- of that of cylinder
(1) three times (2) equal (3) half (4) one-third

82. The total surface area of hemisphere of diameter 7 cm is
(1) $308\ sq.cm$ (2) $462\ sq.cm$ (3) $115.5\ sq.cm$ (4) $77\ sq.cm$

83. If the radius of the cone is same as the height is equal to a, then is slant height is ...
(1) $2\sqrt{a}$ (2) $\sqrt{2}a$ (3) $\sqrt{2a}$ (4) $2a$

84. A sector containing an angle $120°$ is cut off from a circle of radius $21\ cm$ is folded into a cone. The base radius of the cons is (1) $\frac{21}{2}\ cm$ (2) $7\ cm$ (3) $14\ cm$ (4) $\frac{120}{21}\ cm$

85. If the surface area of a sphere is $100\ \pi\ cm^2$ then its diameter is equal to
(1) $25\ cm$ (2) $50\ cm$ (3) $5\ cm$ (4) $10\ cm$

Unit-8: STATISTICS & PROBABILITY

86. The variance of the first 7 natural numbers is
(1) 5 (2) 4 (3) 16 (4) 8

87. Variance of a set of data is 1.96. Its standard deviation is...
(1) 0.14 (2) 1.4 (3) 1.3 (4) $(1.96)^2$

88. The range of first 10 prime numbers is
(1) 28 (2) 22 (3) 29 (4) 27

89. The greatest value of a collection of data is 72 and the least value is 28. Then the coefficient of range is (1) 44 (2) 4.4 (3) 0.44 (4) 100

90. Standard deviation of a collection of data is $2\sqrt{2}$. If each value is multiplied by $\sqrt{2}$ then the standard deviation of new data is (1) 2 (2) 4 (3). $2\sqrt{2}$ (4) $4\sqrt{2}$

91. Which one of the following condition is true when the standard deviation (σ) lies between 0 and 1
(1) $\sigma > \sigma^2$ (2) $\sigma \geq \sigma^2$ (3) $\sigma < \sigma^2$ (4) $\sigma \leq \sigma^2$

92. If $P(A) = 0.34$, $P(B) = 0.46$ and A and B are mutually exclusive events then $P(A \cup B) = ?$
(1) 0.34 (2) 0.80 (3) 0.46 (4) 0.12

93. Which of the following values cannot be a probability of an event?
(i) 100% (ii) $\frac{9898}{9897}$ (iii) 0.000001 (iv) $\frac{1-\sqrt{3}}{2}$
(1) (i) and (ii) (2) (ii) only (3)(iii) and (iv) (4) (ii) and (iv)

94. The probability of getting 53 Sundays in a leap year is
(1) $\frac{2}{7}$ (2) $\frac{1}{7}$ (3) $\frac{7}{53}$ (4) $\frac{1}{53}$

95. The probability of drawing the number 6 from a well shuffled pack of 52 cards is ...
(1) $\frac{1}{13}$ (2) $\frac{1}{2}$ (3) $\frac{1}{26}$ (4) $\frac{1}{4}$

96. The probability of drawing a red ball from a bag containing 4 white balls and 6 blue balls is
(1) $\frac{4}{10}$ (2) $\frac{6}{10}$ (3) 0 (4) 1

97. In a family of 3 children, the probability of having atleast one boy is
(1) $\frac{7}{8}$ (2) $\frac{1}{8}$ (3) $\frac{5}{8}$ (4) $\frac{3}{4}$

98. $P(A \cup B) + P(A \cap B) = ?$
(1) $P(\overline{A}) + P(\overline{B})$ (2) P(S) (3) φ (4) P(A) + P(B)

99. A fair die is thrown once. The probability of getting a perfect cube number is
(1) 1 (2) 0 (3) $\frac{1}{2}$ (4) $\frac{1}{6}$

100. A number is selected from 1 to 25. The probability that its prime is
(1) $\frac{9}{26}$ (2) $\frac{9}{25}$ (3) $\frac{10}{25}$ (4) $\frac{1}{3}$

All the best!