

2 X - Maths

- 20) Construct a 3×3 matrix whose elements are $a_i = |-2|$
- 21) Find the value of 'a', if (2, 3), (4, a) and (6, -3) are collinear.
- 22) Find the intercepts made by the line $4x - 9y + 36 = 0$ on the coordinate axes.
- 23) Prove that $\sqrt{\frac{1+\sin\theta}{1-\sin\theta}} = \sec\theta + \tan\theta$
- 24) If the base area of a hemispherical solid is 1386 sq.mtrs, then find its total surface area?
- 25) If the ratio of radii of two spheres is 4:7, find the ratio of their volumes.
- 26) Find the range and coefficient of range of the following data: 25, 67, 48, 53, 18, 39, 44
- 27) A coin is tossed thrice. What is the probability of getting two consecutive tails?
- 28) What length of ladder is needed to reach a height of 7m along the wall when the base of the ladder is 4m from the wall?

Part - III

Answer any Ten questions. Question number 42 is compulsory: 10×5=50

- 29) $A = \{x \in \mathbb{N} / x < 3\}$, $B = \{x \in \mathbb{W} / 0 < x \leq 3\}$ and $C = \{3, 5\}$. Verify that $A \times (B - C) = (A \times B) - (A \times C)$.
- 30) Let $f(x) = 2x + 3$, $g(x) = 1 - 2x$ and $h(x) = 3x$. Prove that composition of functions is associative.
- 31) The ratio of 6th and 8th term of an A.P is 7:9. Find the ratio of 9th term to 13th term.
- 32) Find the sum to n terms of the series $3 + 33 + 333 + \dots$ to n terms.
- 33) The roots of the equation $x^2 + 6x - 4 = 0$ are α, β . Find the quadratic equation whose roots are $\alpha^2\beta$ and $\beta^2\alpha$.
- 34) If $A = \begin{bmatrix} 3 & 1 \\ -1 & 2 \end{bmatrix}$ show that $A^2 - 5A + 7I_2 = 0$
- 35) State and prove Angle Bisector theorem.
- 36) Let $A(3, -4)$, $B(9, -4)$, $C(5, -7)$ and $D(7, -7)$. Show that ABCD is a trapezium.
- 37) Find the equation of a straight line passing through (1, -4) and has intercepts which are in the ratio 2:5.
- 38) From the top of a tower 50m high, the angles of depression of the top and bottom of a tree are observed to be 30° and 45° respectively. Find the height of the tree. ($\sqrt{3} = 1.732$)
- 39) The radius and height of a cylinder are in the ratio 5:7 and its curved surface area is 5500 sq.cm. Find its radius and height.
- 40) For a group of 100 candidates the mean and standard deviation of their marks were found to be 60 and 15 respectively. Later on it was found that the scores 45 and 72 were wrongly entered as 40 and 27. Find the correct mean and standard deviation.
- 41) A coin is tossed thrice. Find the probability of getting exactly two heads, or at least one tail or two consecutive heads.
- 42) If $A = \frac{2x+1}{2x-1}$ $B = \frac{2x-1}{2x+1}$ then, find $\frac{1}{A-B} - \frac{2B}{A^2-B^2}$

Part - IV

Answer all questions:-

- 43) a) Draw a triangle ABC of base $BC = 8\text{cm}$, $\angle A = 60^\circ$ and the bisector of $\angle A$ meets BC at D such that $BD = 6\text{cm}$. 2×8=16
[or]
 b) Draw a circle of diameter 6cm from a point P, which is 8cm away from its centre. Draw the two tangents PA and PB to the circle and measure their lengths.
- 44) a) Graph the quadratic equation $(2x-3)(x+2) = 0$ and states its nature of solutions. [or]
 b) Draw the graph of $y = 2x^2 - 3x - 5$ and hence solve $2x^2 - 4x - 6 = 0$.