

Section-A

Q.1: - Choose the correct answer for each from the given options:

- (i) If "b" is a real number, the point (0,b) lies in/on
 (a) 2nd quadrant (b) 3rd quadrant (c) x-axis (d) y-axis
- (ii) $x + 4 = y$ and $y = 6 \Rightarrow x + 4 = 6$, this property is called
 (a) Reflexive property (b) Symmetric property
 (c) Transitive property (d) Additive property
- (iii) Total number of digits in 225 are
 (a) 8 (b) 9 (c) 10 (d) 11
- (iv) The degree of the polynomial $x^2 + xy^2 + y$ is
 (a) 1 (b) 2 (c) 3 (d) 4
- (v) L.C.M of $x^2 + 8$ and $x + 2$ is
 (a) $x^2 + 2x + 4$ (b) $x^2 - 8$ (c) $x^2 + 8$ (d) $x^2 + 16$
- (vi) If $a + b = 2$ and $a - b = 2$, then the value of $a + b$ is
 (a) 2 (b) $3/2$ (c) -1 (d) 4
- (vii) The method of obtaining a relation independent of any particular variable is called ...
 (a) Rationalization (b) Addition (c) Elimination (d) Equation
- (viii) If $A = \begin{bmatrix} a & b \\ c & d \end{bmatrix}$, then $ad - bc$ is called of matrix A.
 (a) Conjugate (b) Determinant (c) Transpose (d) None of these
- (ix) The solution set of the simultaneous equations $x + y = 5$ and $2x - y = 7$ is
 (a) {4, 1} (b) {(1, 4)} (c) {(4, 1)} (d) {2, 3}
- (x) If q, p, r are in continued proportion, then
 (a) $p^2 = q \cdot r$ (b) $P^2 = (qr)^2$ (c) $P = qr$ (d) $P^2 = qr$
- (xi) Sum of 10 observations is 125, the mean is
 (a) 12.5 (b) 1.25 (c) 1250 (d) None of these

- (xii) The angles whose arms form two pairs of opposite rays are called
 (a) Supplementary angles (b) Complementary angles
 (c) Vertically opposite angles (d) Adjacent angles
- (xiii) is the point of concurrency of the medians of a triangle.
 (a) Centroid (b) E-centre (c) Orthocentre (d) In-centre
- (xiv) If the corresponding angles of two polygons are congruent then their corresponding sides are
 (a) Congruent (b) Equal (c) Proportional (d) None of these
- (xv) If $R = \{(a, b), (c, d), (e, f)\}$, then Range $R =$
 (a) $\{a, b, c\}$ (b) $\{b, d, f\}$ (c) $\{a, c, e\}$ (d) $\{d, e, f\}$
- (xvi) From a point outside the circle tangent can be drawn to the circle.
 (a) 1 (b) 2 (c) 3 (d) None of these
- (xvii) If $(x-1)(x+3) = 0$, then $x =$
 (a) 1, 3 (b) -1, -3 (c) -1, 3 (d) 1, -3
- (xviii) If $a:b = c:d$, then $a:c = b:d$ this property of proportion is called
 (a) Dividendo (b) Alternendo (c) Invertendo (d) Componendo
- (xix) Which of the following statement is not true.
 (a) $\cos 10^\circ = \sin 80^\circ$ (b) $\tan 30^\circ = \cot 60^\circ$ (c) $\sec 35^\circ = \csc 65^\circ$
 (d) $\tan 30^\circ = 1/\cot 30^\circ$
- (xx) $\operatorname{Cosec}(\theta - 90^\circ) =$
 (a) $\sin \theta$ (b) $\cos \theta$ (c) $\sec \theta$ (d) None of these

Section-B

Note: Solve any TEN of the following questions. Each question carries 05 marks.

- Q.2: List all the relations on the set $\{0, 1\}$. How many of them contains the pair $(0, 1)$?
- Q.3: if $x = 5 - 2$, then find the value of $x^4 + \frac{1}{x^4}$
- Q.4: Find the logarithms of 16 to the base $2\sqrt{2}$
- Q.5: If $x - y = 2\sqrt{2}$, then prove that: $x^2 - y^2 - 6\sqrt{2}xy = 16\sqrt{2}$
- Q.6: For what values of p and q , $x^2 + 4x + 10x^2 + px + q$ will be perfect square?
- Q.7: Solve any ONE of the following equations.

(i) $\frac{2x - 3}{5} = \frac{x - 3}{2}$ (ii) $\sqrt{2y - 3} = \sqrt{3y + 4}$

- Q.8: Eliminate "x" from the equations: $x + 1/x = 2p$, $x - 1/x = 2q + 1$.

Q.9: If $a : b :: c : d$, then show that: $\frac{a^2 - c^2}{ac} = \frac{b^2 - d^2}{bd}$

- Q.10: Solve ABC when $\angle C = 90^\circ$, $\angle B = 60^\circ$ and $a = 2$ cm

- Q.11: Calculate the arithmetic mean when $D = x - 100$, $\sum fD = 400$ = 400 and .

Q.12: If two angles of a triangle are congruent, the side opposite to them are also congruent. Prove it.

Q.13: If a line is drawn perpendicular to a radial segment of a circle at its outer end point, it is tangent to the circle at that end point. Prove it.

Q.14: Solve the equations by using Cramer's rule: $-72x + y = 6$, $26x + 18y = 2$.

Q.15: Define any TWO of the following terms and draw the figures.

(i) Vertically Opposite Angles (ii) Alternate Angles

(iii) Inscribed Angles of an Arc

Section-C

Note: Solve any TWO of the following. Each question carries 15(8+7) marks.

Q.16: Factorize any FIVE of the following:

(i) $x^2 + 4x$

(ii) $a^2 - a + 2$

(iii) $27x^2 - 1 + 8y + 18xy$

(iv) $x^2y - 21/xy$

(v) $1 - x^2 - y^2 + 2xy$

(vi) $5(2x+y)^2 - 13(2x+y) - 6$

(vii) $x(y^2 - z^2) + y(z^2 - x^2) + z(x^2 - y^2)$

Q.17: (a) Construct a $\triangle ABC$ such that $m\angle A = 4.5^\circ$, $m\angle B = 5^\circ$, $m\angle C = 60^\circ$ and also draw its circumscribed circle.

(b) Find all the values of trigonometric ratios of 45° .

Q.18(a): If $A = \begin{bmatrix} 2 & 3 \\ 4 & 5 \end{bmatrix}$, then prove that $|A^{-1}| = 1/|A|$.

(b) Reduce to a single term: $\frac{1}{3} \log(x-1) + \frac{10}{9} \log(x+1) - \frac{1}{9} \log(x+1)$.