Section-A

Q.1: Choose the correct answer for each fromt he given options:

(i) Intersection of two _____ sets is empty always.
(a) non-empty (b) Equivalnet (c) Power (d) Discount

(ii) For all x, y; xy = yx, This is _____ property w.r.t Multiplication.
(a) Commutative (b) Distributive (c) Assoiactive (d) Reflexive

(iii) $\log_x x \times \log_a a =$ _____
(a) 0 (b) 1 (c) -1 (d) Infinite

(Iv) $\sqrt{x^2+2xy+y^2}$ is a/an _____ expression.
(a) Rational (b) Irrational (c) Polynomial (d) Monomial

(v) Square roots(s) $x^2+2+\frac{1}{x^2}$ is /are _____
(a) $x+\frac{1}{x}$ (b) $-x-\frac{1}{x}$ (c) Both (a) and (b) (d) None of these

(vi) The graph of these equation x + y = 5 and x + 2y = 9 represents lines l1 and l2

intersection each other at point_____

(A) (4, 1) (b) (-4, -1) (c) (1, 4) (d) (3, 2)

(vii) If $A = \begin{bmatrix} 5 & 6 \\ 3 & -1 \end{bmatrix}$, then $A' =$ _____

(a) $\begin{bmatrix} -1 & 6 \\ 3 & 5 \end{bmatrix}$ (b) $\begin{bmatrix} -1 & 3 \\ 6 & 5 \end{bmatrix}$ (c) $\begin{bmatrix} 5 & 3 \\ 6 & -1 \end{bmatrix}$ (d) $\begin{bmatrix} 3 & -1 \\ 5 & 6 \end{bmatrix}$

(viii) If $a - x - b$ and $c + x = d$ then equation _____ will be the relation free from x.

(a) $a + c = b + d$ (b) $a + b = c + d$ (c) $a - c = b - d$

(d) $a + b + c + d = 0$

(ix) _____ is a commensurable ratio.

(a) $\sqrt{4} : \sqrt{36}$ (b) $\sqrt{9} : \sqrt{2}$ (c) $\sqrt{5} : \sqrt{25}$ (d) None of these

(x) Median of the data 12, 10, 11, 13, 9, 19 is _____.

(a) 11.5 (b) 12.5 (c) 10.5 (d) 10

(xi) If the vertex and one arm are common of two angles then they are called _____.

(a) Adjacent angles (b) Supplementary angles (c) Complementary

(d) Congurent angles

(xii) _____ chord(s) can be drawn in a circle from a point of a circle.

(a) Only one (b) Infinite (c) No (d) Two

(xiii) In two similar triangles _____ are congruent.

(a) Angles (b) Areas (c) Medians (d) All of these

(xiv) A circle which touches one side of a triangle externally and two sides produced internally is called _____

(a) Circum-circle (b) Incentre (c) In-circle (d) Escribed-circle

(xv) Opposite angles of a cyclic quadrilateral are _____

(a) Always equal (b) Complementary (c) Supplementary

(d) Always right angles

(xvi) The point through which the medians of a triangle pass is called _____.

(a) centriod (b) Incentre (c) Circum-centre

(d) None of these

(xvii) $x^2y^2 + xy - 2 =$ _____

(a) $(xy - 1)(xy + 1)$ (b) $(xy - 1)(xy - 1)$ (c) $(xy - 2)(xy + 1)$

(d) $(xy - 1)(xy + 2)$

(xviii) $\text{cosec}(m\angle B) =$ _____

(a) $\sin(90° - m\angle B)$ (b) $\cos(90° - m\angle B)$ (c) $\sec(90° - m\angle B)$

(d) $\tan(90° - m\angle B)$

(xix) $x^3 - x^2 + 2 =$ _____

(a) $(x - 1)(x^2 + 2x + 2)$ (b) $(x + 1)(x^2 - 2x - 2)$ (c) $(x + 1)(x^2 + 2x - 2)$

(d) $(x + 1)(x^2 - 2x + 2)$

(Xx) $\frac{\sqrt{1 - \cos^2 x}}{\cos x} =$ _____

(a) cot x (b) sec x (c) tan x (d) sin x

Section-B

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

Q.2: Verify distributive property of union over intersection, if A ={1,2,3,4 , B={3,4,5}and C={1,5}

Q.3: If $x = \sqrt{2} + \sqrt{3}$ then find the conjugate of "x" and show that product of "x" with its conjugate is a rational number.

Q.4: Find x from the equation given by $c^x . d^{x-1} = a$

Q.5: Find the values of a + b + c when ab + bc + ca = 4 and $a^2 + b^2 + c^2 = 8$

Q.6: Find the 2nd polynomial when 1st polynomial is $x^2 - 5x + 6$, there HCF is x - 3 and LCM is $x^3 - 9x^2 + 26x - 24$.

Q.7: Find the solution set of " $|3x-2| < x + 5, \forall x \in IR$

Q.8: Eliminate "x" by using formula in the equations $ax^2 + bx + c = 0$ and $px^2 + qx + r = 0$

Q.9: In a circle of radius 5cm, a chord measuring 8cm has been drawn, find its distance from the centre of the circle.

Q.10: Find the range and standard deviation of the numbers 10, 10, 25, 15,30, 30

Q.11: Any point on the bisector of a an angle is equidistant from its arms. Prove it.

Q.12: Define any ONE of the following terms and illustrate with figure.

Secant of Circle _ Circum -Circle of a Triangle _ Parallelogram

Q.13: Take a XYZ and draw the bisectors of its angles and show that they are concurrent.

Q.14: Use matrices to solve te equation: x + 2y = 6 and 2x + 7y = 3.

Q.15: If $\sec\theta = \frac{17}{8}$, find the values of remaining trigonometric ratios by using " Indentities".

Section-C

Note: Solve any TWO of the following questions.

Q.16: (a) Factorize the following:

(i) $16x^4 - 97x^2y^2 + 81y^4$ (ii) $x^3 + 7x^2 + 14x + 8$

Simplify: $\frac{x+2y}{x^2-xy} \div \frac{x^2+4xy+3y^2}{x(x^2-y^2)}$ **OR**

(b) A man standing on the top of a light house, 250m high, observes that the angles of depression of two ships on the opposite sides are of and respectively. If foot of the light house and ships are on a straight line find the distance between the ships.

Q.17(a): Prove that, if one pair of opposite sides of a quadrillatral are congruent and parallel, it is parallelogram.

(b) One and only one circle can pass through any three non-collinear points, Prove it.

Q.18(a): Solve the following by using completing the square method.

$y^2 - 4y = y - 6, (y \neq 0)$

(b) Prove that:

$$\frac{\cos x}{1+\sin x} + \frac{1+\sin x}{\cos x} = 2\sec x$$