Section – A

Multiple Choice Questions (MCQ'S)

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

1. Intersection of two _____ sets is empty always.

   (a) Non – empty (b) Equivalent (c) Power (d) Discount

2. For all x,y , xy = xy, This is _____ property w.r.t Multiplication.

   (a) Commutative (b) Distributive (c) Associative (d) Reflexive

3. $\log_x \times \log_a =$ _____

   (a) 0 (b) 1 (c) – 1 (d) Infinite

4. $\sqrt{x^2+2xy+y^2}$ is a / an _____ expression.

   (a) Rational (b) Irrational (c) Polynomial (d) Monomial

5. 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

6. The graph of these equation $x+y=5$ and $x+2y=9$ represents lines l_1 and l_2 intersecting each other at point _____.

   (a) $(4,1)$ (b) $(-4,-1)$ (c) $(1,4)$ (d) $(3,2)$

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

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

8. 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) $a+b+c+d=0$

9. _____ is a commensurable ratie.

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

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

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

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

(a) Adjacent Angles (b) Supplementary Angles

(c) Complementary Angles (d) Congruent Angles

12. _____ Chords (s) can be draw in a circle from a point of a circle.

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

13. In two similar triangles _____ are congruent.

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

14. A circle which touches one side of a triangle externally and two sides product internally is called _____.

(a) Circum – Circle (b) In-centre (c) In-Circle (d) Escribed Circle

15. Opposite angles of a cyclic quadrilateral are _____.

(a) Always equal (b) Complementary

(c) Supplementary (d) Always right angles

16. The point through which the medians of a triangle pass is called _____.

(a) Centroid (b) In-centre (c)Circum centre (d)None of these

17. $xy+xy-2=$ _____

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

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

18. $\text{cosec}(mB)=$ _____

(a) $\sin(90-mB)$ (b) $\cos(90-mB)$

(c) $\sec(90-mB)$ (d) $\tan(90-mB)$

19. $x'-x'+2=$ _____.

(a) $(x-1)(x+2x+2)$ (b) $(x+1)(x'-2x-2)$

(c) $(x+1)(x'+2x-2)$ (d) $(x+1)(x'-2x+2)$

20. $\dfrac{\sqrt{1-\cos^2 x}}{\cos x}=$ _____.

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

Section – B

(Short Answers)

Note: Answer 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 $c^x \cdot d^{x-1} = a$

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, their 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 5 cm, 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 an angle is equidistant from its arms. Prove it.

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

(i) Secant of Circle

(ii) Circum – Circle of a Triangle

(iii) Parallelogram

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

Q.14 Use matrices to solve the equations: $x+2=6$ and $2x+7y=3$

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

Section – C
(Descriptive)

Note: Answer any TWO of the following questions. Each question carries 10 marks.

Q.16 (a) Factorize the following:

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

OR

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

(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 60^0 and 30^0 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 quadrilateral are congruent and parallel, it is a 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:

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

Section - A

Multiple Choice Questions (MCQ'S)

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

1. Ibn-ul-Haitham contributed toward _____ Physics.
   (a) Nuclear (b) Oceanographic (c) Optical (d) Thermal
2. One meter is equal to _____.
   (a) $10^3\ \eta m$ (b) $10^6\ \eta m$ (c) $10^9\ \eta m$ (d) $10^{12}\ \eta m$
3. Rate of displacement with respect to time is known as _____.
   (a) Speed (b) Velocity
   (c) Acceleration (d) Uniform acceleration
4. The unit of coefficient of Friction is _____.
   (a) Newton (b) Kilogram (c) Meter (d)None of these
5. We use a _____ to disperse white light into different colours.
   (a) Convex lenses (b) Prism
   (c) Convex mirror (d) Concave mirror
6. The turning effect of a force about an axis is _____.
   (a) Force (b) Rotation (c) Torque (d) Momentum
7. Power is defined as _____.
   (a) Rate of change of position (b) Rate of change of force
   (c) Time rate of doing work (d) None of these
8. Which of the following belongs to third kind of lever?
   (a) Pair of scissor (b) Forceps (c) Door (d) None of these

9. The number of prisms in periscope is _____.
   (a) One (b) Two (c) Three (d) Four
10. A motion which repeats itself in equal interwals of time is called _____.
   (a) Loudness (b) Amplitude (c) Time period (d) Frequency
11. 1hp = _____ watts.
   (a) 746 (b) 644 (c) 580 (d) 640
12. If $\overrightarrow{F_x}$ and $\overrightarrow{F_y}$ are rectangular components of force $\vec{F}$ the $\tan\theta$ = _____.
   (a) $\frac{\overrightarrow{F_x}}{\overrightarrow{F_y}}$ (b) $\frac{\overrightarrow{F_y}}{\overrightarrow{F_x}}$ (c) $\overrightarrow{F_x} - \overrightarrow{F_y}$ (d) $\overrightarrow{F_x} + \overrightarrow{F_y}$
13. Gravitational acceleration acts on bodies vertically _____.
   (a) Upward (b) Downward (c) Inwards (d)None of these
14. The relation between electric current and the magnetic field was discovered.
   (a) Newton (b) Faraday (c) Fleming (d) Oersted
15. Archimede's principle is applied to determine.
   (a) Specific heat (b) Specific gravity
   (c) Specific resistance (d) None of these
16. In a fission process which partial causes a uranium -235 nucleus to split?
   (a) Alpha (b) Gamma Rays (c) Neutron (d) Proton
17. The pupil of eye control is _____.
   (a) The focal length of eye
   (b) The range of accommodation of eye
   (c) The amount of light the eye
   (d) The distance of distinct vision