

## Section-A

## Multiple Choice Questions (MCQ's)

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

- (i) An angle with measure less than  $90^\circ$  is called \_\_\_\_\_.  
(a) Acute angle (b) Right angle (c) Obtuse angle (d) None of these
- (ii) A triangle having two sides congruent is called a/an \_\_\_\_\_.  
(a) Isosceles triangle (b) Scalene triangle  
(c) Equilateral triangle (d) None of these
- (iii) The sub duplicate of 5:9 is \_\_\_\_\_.  
(a) 2:3 (b) 16:81 (c) 8:18 (d) 6:4
- (iv) A circle which passes through three vertices of a triangle is called \_\_\_\_\_.  
(a) Escribed circle (b) Circum circle (c) Inscribed circle  
(d) None of these
- (v)  $\tan 60^\circ =$  \_\_\_\_\_.  
(a)  $\sqrt{3}$  (b) 1 (c)  $\frac{1}{\sqrt{3}}$  (d)  $\frac{2}{\sqrt{3}}$
- (vi) The Cartesian product of set A and B written as \_\_\_\_\_.  
(a) A.B (b) A x B (c) A  $\Delta$  B (d) B x A
- (vii) (-3, -2) is in \_\_\_\_\_ quadrant.  
(a) Second (b) Third (c) Fourth (d) First
- (viii)  $\log_2 x = 3$ , then  $x =$  \_\_\_\_\_.  
(a) 6 (b) 8 (c) 10 (d) 5
- (ix) The degree of polynomial  $x^2 + xy^2 + y$  is \_\_\_\_\_.  
(a) 2 (b) 3 (c) 4 (d) 1
- (x) The natural logarithm has base \_\_\_\_\_.  
(a)  $\hat{\wedge}$  (b) e (c) 10 (d) 0
- (xi) The sum of 10 observations is 125, the mean is \_\_\_\_\_.  
(a) 12.5 (b) 50 (c) 75 (d) -15
- (xii) Solution set of  $\sqrt{y-2} = -4$  is \_\_\_\_\_.  
(a) 18 (b)  $\pm 4$  (c) { } (d)  $\pm 16$

- (xiii)  $\sec 30^\circ =$  \_\_\_\_\_  
 (a)  $\frac{2}{\sqrt{3}}$  (b)  $\sqrt{2}$  (c) 2 (d) 1
- (xiv) In a right angled triangle the side opposite to right angle is called \_\_\_\_\_  
 (a) perpendicular (b) Hypotenuse (c) Altitude (d) None of these
- (xv) The measure of an angle inscribed in a semi-circle is equal to \_\_\_\_\_  
 (a)  $90^\circ$  (b)  $180^\circ$  (c)  $120^\circ$  (d)  $360^\circ$
- (xvi)  $(-x)^2 (-x)^3 (-x)^4 =$  \_\_\_\_\_  
 (a)  $-x^9$  (b)  $-x^{25}$  (c)  $x^9$  (d)  $x^{12}$
- (xvii) If  $a:b=c:d$  then  $a:c=b:d$  this property of proportion is called \_\_\_\_\_  
 (a) Dividendo (b) Alternando (c) Inverendo (d) Componendo
- (xviii) If  $A = \begin{bmatrix} 5 & 3 \\ 3 & -1 \end{bmatrix}$ , then  $A^t =$  \_\_\_\_\_  
 (a)  $\begin{bmatrix} 5 & 3 \\ 6 & -1 \end{bmatrix}$  (b)  $\begin{bmatrix} 6 & 3 \\ 5 & -1 \end{bmatrix}$  (c)  $\begin{bmatrix} 6 & 5 \\ -1 & 3 \end{bmatrix}$  (d)  $\begin{bmatrix} 6 & -1 \\ 3 & 5 \end{bmatrix}$
- (xix) Multiplicative inverse of matrix A is written as \_\_\_\_\_  
 (a)  $A^t$  (b)  $A^{-1}$  (c)  $|A|$  (d) A
- (xx) The L.C.M of  $x^3 - y^3$  and  $x^6 - y^6$  is \_\_\_\_\_  
 (a)  $x^3 - y^3$  (b)  $x^3 + y^3$  (c)  $x^6 + y^6$  (d)  $x^6 - y^6$

### Section-B

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

- Q.2 If  $A = \{1, 2, 3, 4\}$  and  $B = \{2, 4, 6, 8\}$  show that  $A \Delta B = (A - B) \cup (B - A)$
- Q.3 If  $a = \sqrt{10} + 3$ , find the value of  $a + \frac{1}{a}$ ,  $a - \frac{1}{a}$  and  $a^2 - \frac{1}{a^2}$ .
- Q.4 Simplify:  
 (i)  $\left(\frac{18x^4y^3z^2}{6ab^2c^5}\right)$   
 (ii)  $\left(\frac{3a^3b^2c^6}{xyz}\right)^{-5}$
- Q.5 The measure of a diameter of the moon is 3500 km. After converting it into centimeters, write it in scientific notation.
- Q.6 Find the value of y: (i)  $\log_{\sqrt{5}} 25 = y$  (ii)  $\log_{55} 55 = y$
- Q.7 Find the H.C.F of the following polynomials by factor method:  
 $9x^2 + 63x + 108$ ,  $9x^2 - 45x - 216$  and  $18x^2 + 45x - 27$
- Q.8 If  $a + \frac{1}{a} = 2$  prove that  $a^2 + \frac{1}{a^2} = a^4 + \frac{1}{a^4} = a^3 + \frac{1}{a^3}$
- Q.9 Solve if possible by using Cramer's rule:  $x + 2y = 6$ ,  $2x + 7y = 3$
- Q.10 A mother is 21 years older than her new born baby. How old will the baby be when her age is  $\frac{1}{4}$  that her mother.

Q.11 Resolve into factors :

$$a^4(b^2 - c^2) + b^4(c^2 - a^2) + c^4(a^2 - b^2)$$

Q.12 Define median. How do we calculate median for grouped data?

Q.13 What number must be added to each term of the ratio 6:27 to make it equal to 1:3

Q.14 Find the solution set of the equation :  $\sqrt{12x - 4} = \sqrt{4x + 8}$ , and also verify the answer.

Q.15 Find the number of digit in (i)  $3^{19}$  (ii)  $9^{48}$

### Section-C

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

Q.16 (a) The product of two expression is  $12x^4 - 34x^3 + 27x^2 - 17x + 5$ , if one expression is  $3x^2 - 7x + 5$ , find the other.

(b) Factorize:  $36x^2 + 154x - 36$

Q.17(a) Using the appropriate formula, find the values : (i)  $(1104 \times 1104)$  (ii)  $(98)^2$

(b) Following are the daily earning (in Rs) of ten workers:

188, 170, 172, 125, 115, 195, 181, 190, 195, 190

**Calculate :**

(i) Arithmetic Mean (ii) Median (iii) Mode

Q.18(a) Ali standing in a stream finds that he measures of the angles of elevation of two trees, of heights 6m and 8m, on opposite banks in the line with him are of  $30^\circ$  and  $45^\circ$ , respectively. Find the width of the stream.

(b) Define any TWO of the following terms and illustrate with figure:

(i) Tangent to the circle

(b) Supplement postulate

(iii) Interior and exterior and exterior of triangle