Mathematics (INTERMEDIATE PART – I , Class 11th) - (I)   Paper : I

Time: 30 Minutes   **Objective**   **Code : 6191**   Marks : 20

Note: You have four choices for each objective type question as A, B, C and D. The choice which you think is correct, fill that circle in front of that question number. Use marker or pen to fill the circles. Cutting or filling two or more circles will result in zero mark in that question.

1.

1. $(1+i)^8 =$

(A)   2   (B)   4   (C)   8   (D)   16

2. The conjunction of two statements p and q is denoted by

(A) $p \leftrightarrow q$ (B) $p \rightarrow q$ (C) $q \rightarrow p$ (D) $p \wedge q$

3. If $|A| = 5$, then $|A'| =$

(A) - 5   (B) $\dfrac{1}{5}$ (C) 0   (D) 5

4. If $\begin{vmatrix} a & b \\ c & d \end{vmatrix} = 2$ then $\begin{vmatrix} c & d \\ a & b \end{vmatrix} =$

(A) 2   (B) -2   (C) ± 2 (D) 0

5. No. of roots of the equation $(x-4)^2 = x^2 - 8x + 16$ are

(A) 2   (B) 4   (C) 8   (D) infinite

6. If ω is cube root of unity, then $(1 + \omega - \omega^2)^3 =$

(A) -8ω (B) 8ω (C) 8   (D) -8

7. $\dfrac{p(x)}{x^2 + 1}$ will be proper fraction if degree of $p(x)$ is

(A) 1   (B) 2   (C) 3   (D) 4

8. The series $a + ar + ar^2 + \text{----} \infty$ converges, if

(A) $|r| > 1$ (B) $|r| \geq 1$ (C) $|r| \leq 1$ (D) $|r| < 1$

9. A , G , H , are in

(A) A . P   (B) G . P   (C) H . P   (D) series

10. For an event A, range of its probability P (A) is

(A) $-1 \leq P(A) \leq 1$ (B) $0 < P(A) < 1$ (C) $0 \leq P(A) \leq 1$ (D) $P(A) = 1$

11. If $^nc_4 - {^nc_5} = 0$, then $n =$

(A) 0   (B) 4   (C) 6   (D) 9

(Turn Over)

Roll No._____ Annual 2019

(INTERMEDIATE PART – I , Class 11th)

Paper : I

Mathematics

(SUBJECTIVE)

Marks : 80

Time : 2:30 Hours

Note : Section I is compulsory. Attempt any three (3) questions from section II.

(SECTION – I)

$(8 \times 2 = 16)$

2. **Write short answers to any Eight parts :**

i. Prove that $\bar{z} = z$ iff z is real .

ii. Separate into real and imaginary parts. $\dfrac{(-2+3i)^2}{1+i}$

iii. Does the set $\{0, -1\}$ possess closure property with respect to (i) addition (ii) multiplication?

iv. Write the set $\{x \mid x \in p \wedge x < 12\}$ in descriptive and tabular form.

v. Prove that $P \to p \vee q$ is tautology.

vi. Define a group.

vii. If A is any square matrix of order 3 , show that $A - A'$ is skew symmetric .

viii. Define Skew Symmetric Matrix .

ix. If $A = \begin{bmatrix} 1 & 2 \\ a & b \end{bmatrix}$ and $A^2 = \begin{bmatrix} 0 & 0 \\ 0 & 0 \end{bmatrix}$, find values of a and b .

x. Find roots of equation $15x^2 + 2ax - a^2 = 0$ by using quadratic formula.

xi. If α, β are the roots of $3x^2 - 2x + 4 = 0$, find value of $\dfrac{1}{\alpha^2} + \dfrac{1}{\beta^2}$.

xii. Discuss the nature of roots of equation $x^2 + 2x + 3 = 0$.

$(8 \times 2 = 16)$

3. **Write short answers to any Eight parts :**

i. Resolve $\dfrac{1}{x^2 - 1}$ in to partial fractions.

ii. Write identity for $\dfrac{x^2 - 2x + 3}{x^4 + x^2 + 1}$.

iii. Define proper rational fraction.

iv. If $a_n = \dfrac{1}{a + (n-1)d}$, write 1st 4 terms.

v. Which term of the A.P $5 , 2 , -1 ,$ ---------- is -85?

vi. Which term of the sequence $x^2 - y^2 , x+y , \dfrac{x+y}{x-y} , \ldots\ldots is \dfrac{x+y}{(x-y)^9}$

vii. Sum the series $\dfrac{1}{5} + \dfrac{1}{25} + \dfrac{1}{125} + \ldots\ldots\infty$.

viii. Show $G^2 = AH$, Where A , G and H are arithmetic geometric and harmonic means between a and b .

ix. Find the value of n , when . $^n c_{12} = ^n c_6$

x. If $1 + 2 + 4 + \ldots\ldots\ldots + 2^{n-1} = 2^n - 1$ then verify for $n = 3$

xi. Find the fifth term in the expansion of $\left(\dfrac{3}{2} x - \dfrac{1}{3x} \right)^{11}$.

xii. Expand $(1-x)^{-1/2}$ up to 3 terms.

$(9 \times 2 = 18)$

4. **Write short answers to any Nine parts :**

i. If α, β, γ are the angles of a triangle ABC then prove that $Cos(\dfrac{\alpha + \beta}{2}) = \sin \dfrac{\gamma}{2}$

ii. Prove that $\dfrac{\sin\theta - \cos\theta \tan\theta/2}{\cos\theta + \sin\theta \tan\theta/2} = \tan\theta/2$.

(Turn Over)