Class: XI Science

Date: 30/07/2024

Admission Number: _____

Duration: 1 Hour

Max. Marks: 25

Roll number: ____

General Instructions:

Question 1 to 5 carries ONE mark each. Questions 6 to 9 carries TWO marks each. Questions 10 to 13 carries THREE marks each.

1   If X $=\{8^n - 7n - 1 : n \in N\}$ and Y $=\{49n - 49 : n \in N\}$, Then

   (A) X⊂Y   (B) Y ⊂X   (C) X=Y   (D) X∩Y $=\emptyset$

2   If $P \subseteq M$, then which of the following set represents P∩(P∪M)?

   (A) P   (B) M   (C) P∪M   (D) None of these

3   If R is a relation on a finite set having n elements, then the number of relations on A is

   (A) 2^n (B) $2^{n \times n}$ (C) n^2 (D) n^n

4   If f(x) $=64x^3+\frac{1}{x^3}$ and α, β are the roots of $4x + \frac{1}{x} =3$, then,

   (A) f(α) =f$(\beta) = -9$ (B)) f(α) =f$(\beta) = 63$ (C) f$(\alpha) \neq$f(β) (D) None of these

Assertion and Reasoning questions: In the following two questions, a statement of Assertion (A) is followed by a statement of Reason (R). Choose the correct answer out of the following choices.

   (A)   Both A and R are true and R is the correct explanation of A.
   (B)   Both A and R are true and R is not the correct explanation of A.
   (C)   A is true but R is false.
   (D)   A is false but R is true.

5   Assertion (A): If f(x) $=x^4+8x^2-5$ is an even function
   Reason (R):   A function f(x) is said to be an even function if f (-x) = -f(x).

6   Represent the given set in roster form B $=\{x : x \text{ is a perfect cube and } 25 < x < 343\}$.

7   Represent the union of the following two sets by Venn diagram A=$\{a, b, c, e, f\}$, and

   B=$\{l, m, n, e, b\}$.

8   If f(x) $=2x-1$ and g(x) $= x^3$ be real functions, find (f+g) (3).

9   Find the domain of the function f(x) $=\frac{x+1}{x-2}$.

10   Write the following as interval and also represent on real line $\{x: x \in R, -3 < x \leq 7\}$.

11   Let A= {*All prime numbers less than* 10} and

       B={*All odd natural numbers less than* 10}. Find A-(A∩B).

12   Find f(x) +f (-x), if f(x) = $\frac{3x}{2x+5}$.

13   Find the range of the function: f(x) = $\frac{x^2+2}{x^2+1}$, x∈R.

***