TRICHY

COMMON FIRST MID - TERM TEST - 2019
STANDARD - X

Reg. No. ☐☐☐☐☐☐

Time : 1.30 hours

MATHS

Marks: 50

6 × 1 = 6

I. Choose the best answer:

1. If $n(A \times B) = 6$ and $A = \{1, 3\}$ then $n(B)$ is
   a) 1   b) 2   c) 3   d) 6

2. If $f(x) = 2x^2$ and $g(x) = 1/3x$ then $f \circ g$ is
   a) $3/2x^2$ b) $2/3x^2$ c) $2/9x^2$ d) $1/6x^2$

3. Using Euclid's division lemma, if the cube of any positive integer is divided by 9 then the possible remainders are
   a) 0, 1, 8   b) 1, 4, 8   c) 0, 1, 3   d) 1, 3, 5

4. The HCF of two equal possitive integerss k, k is _____.
   a) 1   b) k   c) 0   d) k^2

5. A system of three linear equation in three variables is inconsistent if their planes.
   a) intersect only at a point   b) intersect in a line
   c) coincides with each other   d) do not intersect

6. The GCD of $x^2 - y^2$, $x^3 - y^3$, ...$x^n - y^n$ where $n \in N$, is _____.
   a) $x - y$ b) $x + y$ c) $x^n - y^n$ d) 1

II. Answer any 7 of the following. Question Number 16 is compulsory: 7 × 2 = 14

7. If $A = \{1, 3, 5\}$ and $B = \{2, 3\}$ then i) find $A \times B$ ii) $B \times A$.

8. Given $f(x) = 2x^2 - x$ find i) $f(2)$ ii) $f(x) + f(2)$

9. $A = \{1, 2, 3, 4\}$ and $B = N$. Let $f : A \to B$ be defined by $f(x) = x^3$ then
   i) find the range of f ii) Identify the type of function.

10. If $f(x) = x^m$ and $g(x) = x^n$ does $f.g = g \circ f$?

11. Find the greatest number that will divide 445 and 572 leaving remainders 4 and 5 respectively.

12. For what values of natural number n, 4^n can end with the digit 6?

13. Solve $8x \equiv 1 \pmod{11}$

14. Today is Tuesday. My uncle will come after 45 days. In which day my uncle will be coming?

15. Solve : $2x - 3y = 6$; $x + y = 1$

16. a) Find the LCM of the following $16m$, $-12m^2n^2$, $8n^2$ **(OR)**
    b) Describe : "Horizontal line Test"

III. Answer any 4 of the following. (Question number 22 is compulsory):
     4×5=20

17. Let A = {x ∈ N / 1 < x < 4} ; B = {x ∈ W / 0 ≤ x < 2} and C = {x ∈ N / x < 3} then verify that A × (B∪C) = (A×B) ∪ (A×C).

18. If $f(x) = x^2$, $g(x) = 2x$ and $h(x) = x + 4$ then show that be (fog)oh = fo(goh).

19. Find the remainder when 2^{81} is divided by 17.

20. Find the G.C.D. of the following $x^4 - 1$, $x^3 - 11x^2 + x - 11$.

21. Find the LCM of the polynomial $a^2 + 4a - 12$, $a^2 - 5a + 6$ whose GCD is a - 2.

22. a) A = {0, 1, 2, 3} and B = {1, 3, 5, 7, 9} be two sets f : A → B be a function given by f(x) = 2x + 1. Represent this function i) a table ii) ordered pairs iii) a graph iv) an arrow diagram   **(OR)**

    b) Solve the following system of linear equations in three variables:

     1/x - 2/y + 4 = 0,   1/y - 1/z + 1 = 0, 2/z + 3/x = 14

IV. Answer the following: 2×5=10

23. a) Construct a triangle similar to a given triangle PQR with its sides equal to 3/5 of the corresponding sides of the triangle PQR (scale factor 3/5 < 1).   **(OR)**

    b) Construct a triangle similar to given triangle ABC with its sides equal to 6/5 of the corresponding sides of the triangle ABC (scale factor 6/5).

24. Graph the following quadratic equations and state their nature of solutions.

   a) $x^2 + x + 7 = 0$ **(OR)**   b) $x^2 - 8x + 16 = 0$