TRICHY

# COMMON FIRST MID - TERM TEST - 2019

## STANDARD - X

## MATHS

Reg.No. | | | | | | |

*Time : 1.30 hours* *Marks: 50*

**I. Choose the best answer:** **6×1=6**

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 $A = \{x \in N / 1 < x < 4\}$ ; $B = \{x \in W / 0 \leq x < 2\}$ and $C = \{x \in N / x < 3\}$ then verify that $A \times (B \cup C) = (A \times B) \cup (A \times C)$.
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 $f : A \to B$ 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 coresponding 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) $x^2 - 8x + 16 = 0$

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