FMM

FIRST MID TERM TEST - 2024

10 - Std

MATHS

Time : 1.30 Hrs.

MARKS : 50

PART - A

I   Choose the correct answer.   7 X 1 = 7

1. If there are 1024 relations from a set A = {1,2,3,4,5} to a set B, then the number of elements in B is

    a) 3   b) 2   c) 4   d) 8

2. If {(a, 8), (6, b)} represents an identity functions, then the value of a and b are respectively

    a) (8, 6)   b) (8, 8)   c) (6, 8)   d) (6,6)

3. Composition of functions is Associative

    a) always true   b) never true

    c) sometimes true   d) none of the above

4. The sum of the exponents of the prime factors in the prime factorization of 1729 is

    a) 1   b) 2   c) 3   d) 4

5. An A.P. consists of 31 terms. If its 16th term is m, then the sum of all the terms of this A.P. is

    a) 16m   b) 62m   c) 31m   d) $\frac{31}{2}m$

6. The remainder when 7 X 13 X 19 X 23 X 29 x 31 is divided by 6 is

    a) 1   b) 2   c) 3   d) 5

7. The solution of the system x + y - 3z = -6, - 7y + 7z = 7, 3z = 9 is

    a) x = 1, y = 2, z = 3   b) x = -1, y = 2, z = 3

    c) x=-1, y = -2, z = 3   d) x=1, y=-2, z=3

PART - B

II   Answer any five questions. (Q.No. 14 is compulsory)   5 X 2 = 10

8. If AXB = {(3,2), (3,4), (5,2), (5,4)} then find A and B.

9. Let f be a function f : N →N be defined by f(x) = 3x+2, x ∈ N find the images of 2 and 3.

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10. If $f(x) = x - 6$, $g(x) = x^2$ then find fog and gof .

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

12. Which term of an A.P. 16, 11, 6, 1, ... is (-54)?

13. Find the LCM of $8x^4y^2$, $48x^2y^4$.

14. 'a' and 'b' are two positive integers such that $a^b \times b^a = 800$. Find 'a' and 'b'.

PART - C

III Answer any five questions. (Q.No. 21 is compulsory)   5 X 5 = 25

15. Let A = The set of all natural numbers less than 8, B = The set of all prime number less than 8, C = The set of even prime number. Verify that

   (i) $(A \cap B) \times C = (A \times C) \cap (B \times C)$.

16. If $f(x) = x^2$, $g(x) = 3x$, $h(x) = x-2$, prove that $(fog)oh = fo(goh)$

17. Find the sum of all natural numbers between 300 and 600 which are divisible by 7.

18. Use Euclid's division algorithm to find the HCF of 84, 90 and 120.

19. Find the sum of the series $(2^3 - 1^3) + (4^3 - 3^3) + (6^3 - 5^3) + \ldots$ upto 8 terms.

20. Find the GCD of the polynomials $x^3 + x^2 - x + 2$ and $2x^3 - 5x^2 + 5x - 3$.

21. Let A = {1,2,3,4} and B={2,5,8,11,14} be two sets. Let f : A → B be a function given by $f(x) = 3x - 1$. Represent this function   i) by arrow diagram

   ii) in a table form   iii) as a set of ordered pairs   iv) in a graphical form

PART - D

IV Answer all the questions.   1 X 8 = 8

22. a) Construct a triangle similar to a given triangle PQR with its sides equal to $\frac{3}{5}$ of the corresponding sides of the triangle PQR (scale factor $\frac{3}{5} < 1$). **(OR)**

   b) Construct a triangle similar to a given triangle PQR with its sides equal to $\frac{7}{3}$ of the corresponding sides of the triangle PQR (scale factor $\frac{7}{3} > 1$)