FIRST MID TERM TEST - 2023

Time Allowed : 1.30 Hours]

MATHEMATICS

[Max. Marks : 50

PART - A

I.   Choose the Best Answer.   7x1=7

1. If $n(A \times B) = 6$ and $A = \{1,3\}$ then $n(B)$ is -----

   (a) 1   (b) 2   (c) 3   (d) 6

2. The range of the relation $R = \{(x, x^2)/x$ is a Prime unmber less than 13$\}$ is

   (a) $\{2,3,5,7\}$ (b) $\{2,3,5,7,11\}$ (c) $\{4,9,25,49,121\}$ (d) $\{1,4,25,49,121\}$

3. If $\{(a,8)\}, (6,b)\}$ represents an identity function, then the value of a and b are respectively.

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

4. Euclid's division lemma states that for postive integers a and b, there exist unique integers q and r

   such that $a = bq + r$,

   (a) $1 < r < b$ (b) $0 < r < b$ (c) $0 \le r < b$ (d) $0 < r \le b$

5. The Sum of the exponents of the Prime factors in the prime factorization of 1729 is

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

6. In $\triangle LMN$, $\angle L = 60^\circ$ $\angle M = 50^\circ$ If $\triangle LMN \sim \triangle PQR$ then the value of $\angle R$ is

   (a) 40° (b) 70° (c) 30° (d) 110°

7. The next term of the sequence $\dfrac{3}{16}, \dfrac{1}{8}, \dfrac{1}{12}, \dfrac{1}{18}, \ldots\ldots$ is

   (a) $\dfrac{1}{24}$ (b) $\dfrac{1}{27}$ (c) $\dfrac{2}{3}$ (d) $\dfrac{1}{81}$

PART - B

II.   Answer any five questions only.   5x2=10

8. If $B \times A = \{(-2,3), (-2,4), (0,3), (0,4) (3,3), (3,4)\}$ find A and B.

9. A Relation R is given by the set $\{(x,y)/y = x + 3, x \varepsilon \{0,1,2,3,4,5\}\}$. Determine its domain and

   range.

10. Define the function "Bijection".

11. Find K if fof (k) = 5, where f(k) = 2k-1.

12. If 13824 = 2^a x 3^b then find a and b.

13. Find the 8th term of the GP 9,3,1.............

14. Which term of an 16,11,6,1......... is -54?

PART - C

III. **Answer any 5. Q.No. 21 is compulsory.**   5x5=25

15. Let A = { x ε W | x < 2}, B = { x ε N | 1 < x ≤ 4} and C = {3,5}. Verify that A x (B∪C) = (AxB)∪(AxC).

16. 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. Represents this function (i) by arrow diagram (ii) in a table form (iii) as a set of ordered pairs (iv) in a graph form.

17. Use Euclid's division Algorithm to find the Highest common facto (HCF) of 10224 and 9648.

18. Find the GCD of the Polynomials $x^3 + x^2 - x + 2$ and $2x^3 - 5x^2 + 5x - 3$.

19. Find the sum to n terms of the series 3 + 33 + 333 +.......

20. There are 12 pieces of five, ten and twenty rupee currencies whose total value is Rs.105. When first 2 sorts are interchanged in their numbers it is value will be increased by Rs.20. Find the number of currenceis in each sort.

21. If $f(x)$ = 2x + 3, g(x) = 1-2x and h(x) = 3x prove that fo (goh) = (fog) oh.

PART - D

IV. **Answer Any One of the following.**   1x8=8

22. (i) 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 $\left(\text{Scale factor } \frac{3}{5} < 1\right)$

23. (ii) Construct a triangle similar to a given triangle ABC with its sides equal to $\frac{6}{5}$ of the corresponding sides of the triangle ABC. $\left(\text{Scale factor } \frac{6}{5} > 1\right)$

CP / 10 / Mat / 2