

V10M

Virudhunagar District
Common First Mid Term Test - 2024

Standard 10

MATHS

Time: 1.30 Hrs.

Marks: 50

I. Choose the best answer:

7×1=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) $f(x) = (x+1)^3 - (x-1)^3$ represents a function which is
 - a) linear
 - b) cubic
 - c) reciprocal
 - d) quadratic
- 3) The sum of the exponents of the prime factors in the prime factorization of 1729 is
 - a) 1
 - b) 2
 - c) 3
 - d) 4
- 4) If 6 times of 6th term of an A.P is equal to 7 times the 7th term, then the 13th term of the A.P is
 - a) 0
 - b) 6
 - c) 7
 - d) 13
- 5) If $f : A \rightarrow B$ is a bijective function and if $n(B) = 7$, then $n(A)$ is equal to
 - a) 7
 - b) 49
 - c) 1
 - d) 14
- 6) The least number that is divisible by all the numbers from 1 to 10 (both inclusive) is
 - a) 2025
 - b) 5220
 - c) 5025
 - d) 2520
- 7) The next term of the sequence $\frac{3}{16}, \frac{1}{8}, \frac{1}{12}, \frac{1}{18}, \dots$ is
 - a) $\frac{1}{24}$
 - b) $\frac{1}{27}$
 - c) $\frac{2}{3}$
 - d) $\frac{1}{81}$

II. Answer any five questions: (Q.No. 14 is compulsory)

5×2=10

- 8) If $B \times A = \{(-2, 3) (-2, 4) (0, 3) (0, 4) (3, 3) (3, 4)\}$ find A and B.
- 9) If $A = \{-2, -1, 0, 1, 2\}$ and $f : A \rightarrow B$ is an onto function defined by $f(x) = x^2 + x + 1$ then find B.
- 10) Compute x , such that $10^4 \equiv x \pmod{19}$.
- 11) Find x, y and z , given that the numbers $x, 10, y, 24, z$ are in A.P.
- 12) If $1+2+3+\dots+K = 325$, then find $1^3+2^3+3^3+\dots+K^3$.
- 13) A Relation R is given by the set $\{(x, y) / y = x+3, x \in \{0, 1, 2, 3, 4, 5\}\}$. Determine its domain and range.
- 14) Find the sum $3 + 1 + \frac{1}{3} + \dots \infty$.

III. Answer any five questions: (Q.No. 21 is compulsory)

5×5=25

- 15) Let A = The set of all natural numbers less than 8, B = The set of all prime numbers less than 8, C = The set of even prime number verify that $(A \cap B) \times C = (A \times C) \cap (B \times C)$.

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- 16) Let $A = \{1, 2, 3, 4\}$ and $B = \{2, 5, 8, 11, 14\}$ be two sets. Let $f : A \rightarrow B$ 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 ordered pairs
(iv) in a graphical form
- 17) Find the sum of all natural numbers between 600 and 800 which are divisible by 11.
- 18) Find the sum to n terms of the series $5 + 55 + 555 + \dots$
- 19) Rekha has 15 square colour papers of sizes 10 cm, 11 cm, 12 cm, 24 cm. How much area can be decorated with these colour papers?
- 20) The sum of three consecutive terms that are in A.P is 27 and their product is 288. Find the three terms.
- 21) If $f(x) = x - 4$, $g(x) = x^2$ and $h(x) = 3x - 5$, prove that $(f \circ g) \circ h = f \circ (g \circ h)$.

IV. Answer the following:**1 × 8 = 8**

- 22) Construct a triangle similar to a given triangle PQR with its sides equal to $\frac{7}{4}$ of the corresponding sides of the triangle PQR. (scale factor $\frac{7}{4} > 1$)

(OR)

- Construct a triangle similar to a given triangle LMN with its sides equal to $\frac{4}{5}$ of the corresponding sides of the triangle LMN. (scale factor $\frac{4}{5} < 1$)
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