

F T J

FIRST MID TERM TEST - 2022

10 - STD

MATHEMATICS

5 2 1 7

Time : 1.30 hrs.

Marks : 50

PART - I

i) Answer all the questions.

ii) Choose the most appropriate answer and write the option code and the corresponding answer. $7 \times 1 = 7$

- If there are 1024 relations form 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
- If $\{(a, 8), (6, b)\}$ represents an identify function then the value of 'a' and 'b' are respectively
a) (8,6) b) (8,8) c) (6,8) d) (6,6)
- Let $f(x) = \sqrt{1+x^2}$ then
a) $f(xy) = f(x).f(y)$ b) $f(xy) > f(x).f(y)$
c) $f(xy) < f(x).f(y)$ d) none of these
- If $f(x) = 2-3x$, then $f \cdot f(1-x)$ is
a) $9x - 5$ b) $5x - 9$ c) $5x + 9$ d) $5 - 9x$
- The sum of the exponents of the prime factors in the prime factorization of 1729 is
a) 1 b) 2 c) 3 d) 4
- 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) $\frac{1}{81}$
- Find the sum of $2 + 3 + 4 + \dots + 15$ is
a) 225 e) 15 c) 120 d) 119

PART - II

i) Answer any 5 questions.

ii) Question No.14 is compulsory.

 $5 \times 2 = 10$

- 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.

9. Represent the function $f(x) = \sqrt{2x^2 - 5x + 3}$ as a composition of two functions.
10. Define : Constant function.
11. 'a' and 'b' are two positive integers such that $a^b \times b^a = 80^0$.
Find 'a' and 'b'.
12. Which term of an A.P. 16,11,6,1 is - 54?
13. Find the sum to infinity of $16 + 8 + 4 + \dots$
14. Solve : $5x \equiv 4 \pmod{6}$.

PART - III

i) Answer any 5 questions only.

5 X 5 = 25

ii) Question No. 21 is compulsory.

15. Given $A = \{1,2,3\}$, $B = \{2,3,5\}$, $C = \{3,4\}$ and $D = \{1,3,5\}$, check if $(A \cap C) \times (B \cap D) = (A \times B) \cap (C \times D)$ is true?
16. $f(x) = 2x + 3$, $g(x) = 1 - 2x$, $h(x) = 3x$. Prove that $f \circ (g \circ h) = (f \circ g) \circ h$.
17. Use Euclid's Division Algorithm to find the HCF of 396, 504, 636.
18. The sum of three consecutive terms that are in A.P. is 27 and their product is 288. Find the three terms.
19. In a G.P. the 9th term is 32805 and 6th term is 1215. Find the 12th term.
20. Rekha has 15 square colour papers of sizes 10cm, 11cm, 12cm, 24cm. How much area can be decorated with these colour papers?
21. If the function f is defined by $f(x) = \begin{cases} x+2 & \text{if } x > 1 \\ 2, & \text{if } -1 \leq x \leq 1 \\ x-1 & \text{if } -3 < x < -1 \end{cases}$ find the values of
 i) $f(3)$ ii) $f(0)$ iii) $f(-1.5)$ iv) $f(2) + f(-2)$

PART - IV

1 X 8 = 8

22. 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 $\frac{3}{5} < 1$)