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Virudhunagar District Schools First Mid Term Test July 2022

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Standard 10 MATHS

Time: 1.30 Hrs.

Marks 50

Section - I

Note: i) Answer all the 9 questions.

ii) Choose the correct answer from the given four alternatives and write the corresponding code and the corresponding answer.

- 1) If $n(A \times B) = 6$ and $A = \{1, 3\}$ then n(B) is 1) 1 212

2) Let n(A) = m and n(B) = n then the total number of non-empty relations that can be defined from A to B is

- 1) m

3) If $f(x) = 2x^2$ and $g(x) = \frac{1}{3x}$, then fog is $2x^2$

- 1) $\frac{3}{2\sqrt{2}}$
- 2) $\frac{2}{3}$

- 4) If $f(x) = (x+1)^3 (x-1)^3$ represents a function which is
 - 1) Linear
- 2) Cubic
- 3) Reciprocal 4) Quadratic

- 5) If the range of f is proper sub set of the co-domain of f, then the function is called
 - 1) Onto function

2) Many to one function

3) Into function

- 4) None of these
- 6) The sum of the exponents of the prime factors in the prime factorization of 1729 is
 - 1)1

4)4

1) 1 2) 2 3) 3 7) Given $F_1 = 1$, $F_2 = 3$ and $F_n = F_{n-1} + F_{n-2}$ then F_6 is 1) 3 2) 5

- 4) 11

8) In a G.P if $t_1 = \frac{1}{5}$ and $t_2 = \frac{1}{25}$ then the common ratio is 1) 5 2) 25 3) $\frac{1}{5}$

9) If 6 times the 6th term of an A.P is equal to 7 times the 7th term, then the 13th term of the A.P is

- 1)0

- 3)7
- 4) 13

Section - II

Note: i) Answer any 4 questions.

 $4 \times 2 = 8$

- ii) Question number 15 is compulsory.
- iii) Select any 3 questions from the first 5 questions.
- 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.
- 11) Let A = $\{1, 2, 3, 4\}$ and B = N. Let f: A \rightarrow B be defined by $f(x) = x^3$ then (i) Find the range of f (ii) Identify the type of function.
- 12) Find k if fof = 5 where f(k) = 2k-1.

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- 13) Find the next three terms of the sequence 8, 24, 72,
- 14) Find the geometric progression whose first term is -7 and common ratio is 6.
- 15) Find the sum of 3+6+9+.....+96.

(OR)

Compute x such that $10^4 \equiv x \pmod{19}$.

Section - III

Note: i) Answer any 5 questions.

5×5=25

- ii) Question number 22 is compulsory.
- iii) Select any 4 questions from the first 6 questions.
- 16) Let $A = \{x \in W/x < 2\}$, $B = \{x \in N, 1 < x \le 4\}$ and $C = \{3, 5\}$, Verify that $A \times (B \cup C) = (A \times B) \cup (A \times C)$.
- 17) Let $f:A \rightarrow B$ be a function defined by $f(x) = \frac{x}{2} 1$, where $A = \{2, 4, 6, 10, 12\}$, $B = \{0, 1, 2, 4, 5, 9\}$ Represent f by (i) a set of ordered pairs (ii) a table (iii) an arrow diagram (iv) a graph.
- 18) Let $f(x) = x^2$, g(x) = 2x and h(x) = x+4, show that fo(goh) = (fog)oh.
- 19) Find the HCF of 396, 504 and 636.
- 20) The sum of three consecutive terms of an A.P is 27 and their product is 288, find the three terms of the A.P.
- 21) Find the sum to n terms of the series 3+33+333+.....+n terms.

22) If the function f:R
$$\rightarrow$$
R is defined by $f(x) = \begin{cases} 2x + 7; & x < -2 \\ x^2 - 2; & -2 \le x < 3 \\ 3x - 2; & x \ge 3 \end{cases}$

Then find the values of (i) f(4) (ii) f(-2) (iii) f(4)+2f(1) (iv)
$$\frac{f(1)-3f(4)}{f(-3)}$$

(OR)

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?

Section - IV

Note: Answer the following.

1×8=8

23) Construct a triangle similar to given triangle PQR with its sides equal to $\frac{2}{3}$ of

the corresponding sides of the triangle PQR. (Scale factor $\frac{2}{3}$)

(OR)

24) A bus is travelling at a uniform speed of 50 km/hr. Draw the distance time graph and hence find from the graph (i) the constant of variation (ii) how far will it travel in 1½ hrs (iii) the time required to cover a distance of 300 km.