

V10MVirudhunagar District Schools
Common First Mid Term Test - July 2019**Standard 10**
MATHS

Time: 1.30 Hrs.

Marks: 50

I. Choose the correct answer:**8×1=8**

- 1) If $n(A \times B) = 6$ and $A = \{1, 3, 5\}$ then, $n(B)$ is
 1) 1 2) 2 3) 3 4) 6
- 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^n 2) n^m 3) $2^{mn}-1$ 4) 2^{mn}
- 3) The equation of motion of a particle travelling under the influence of gravity is a _____ function of time.
 1) linear 2) cubic 3) reciprocal 4) quadratic
- 4) If the HCF of 65 and 117 is expressible in the form of $65m-117$, then the value of m is
 1) 4 2) 2 3) 1 4) 3
- 5) The value of $(1^3+2^3+3^3+.....+15^3)-(1+2+3+.....+15)$
 1) 14400 2) 14200 3) 14280. 4) 14520
- 6) A system of three linear equations in three variables inconsistent if their planes
 1) intersect only at a point 2) intersect in a line
 3) coincides with each other 4) do not intersect
- 7) If $3\sqrt{x} = 9$, then the value of x is
 1) 3 2) 6 3) 9 4) 12
- 8) In $\triangle LMN$, $L = 60^\circ$, $M = 50^\circ$. If $\triangle LMN \sim \triangle PQR$ then the value of R is
 1) 40° 2) 70° 3) 30° 4) 110°

Answer any SIX questions from the following. Question No. 1 is compulsory:

6×2=12

- 9) Represent the given relation by (a) arrow diagram (b) a graph and (c) a set in roster form, wherever possible
 $\{(x, y) / x = 2y, x \in \{2, 3, 4, 5\}, y \in \{1, 2, 3, 4\}\}$.
- 10) Let $A = \{1, 2, 3\}$, $B = \{4, 5, 6, 7\}$ and $f = \{(1, 4), (2, 5), (3, 6)\}$ be a function from A to B. Identify the type of function.
- 11) If $f(x) = 3x-2$, $g(x) = 2x+k$ and if $f \circ g = g \circ f$, then find the value of k.
- 12) Solve: $8x \equiv 1 \pmod{11}$.

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- 13) In a theatre, there are 20 seats in the front row and 30 rows were allotted. Each successive row contains two additional seats than its front row. How many seats are there in the last row?
- 14) Find the LCM of: $2x^2-5x-3$, $4x^2-36$.
- 15) If $\triangle ABC \sim \triangle DEF$ such that area of $\triangle ABC$ is 9 cm^2 and the area of $\triangle DEF$ is 16 cm^2 and $BC = 2.1 \text{ cm}$. Find the length of EF .
- 16) A) In the AP: 10, 5, 0, -5, ... the common difference d is equal to 5. Justify whether the above statement is true or false.

(OR)

- B) Find the excluded values of the expression $\frac{x^3 - 27}{x^3 + x^2 - 6x}$.

II. Answer any FOUR questions from the following. Question No. 22 is compulsory: 4x5=20

- 17) Let $A = \{x \in W/x < 2\}$, $B = \{x \in N/1 < x \leq 4\}$ and $C = \{3, 5\}$. Verify that $A \times (B \cap C) = (A \times B) \cap (A \times C)$.
- 18) 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?
- 19) 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 its value will be increased by Rs. 20. Find the number of currencies in each sort.
- 20) If $ax^4 + bx^3 + 361x^2 + 220x + 100$ is a perfect square, find the values of a and b .
- 21) A boy of height 90 cm is walking away from the base of a lamp post at a speed of 1.2m/sec. If the lamp post is 3.6m above the ground, find the length of his shadow cast after 4 seconds.
- 22) A) If $f(x) = 3+x$, $g(x) = x^2$ and $h(x) = 1/x$, prove that the composition is associative. (OR)
- B) 10 balls are placed in a straight line on the ground. The distance between any two consecutive balls is 10 metres. How far must a person travel to bring them one by one to a basket placed 10 meters behind the first ball.

Answer the following question:

- A) Discuss the nature of solutions of the quadratic equation $x^2 + x - 12 = 0$. 1x10=10
(OR)
- B) Construct a triangle similar to a given triangle LMN with its sides equal to $4/5$ of the corresponding sides of the triangle LMN. (Scale factor $4/5$).