



Sri Raghavendra Tuition Center

Pass Level Test

10th Standard

Maths

Date : 04-12-24

Reg.No. :

Exam Time : 01:00 Hrs

Total Marks : 50

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EACHER NAME: P.DEEPAK M.Sc.,M.A.,B.Ed.,DCA.,TET-1.,TET-2.,

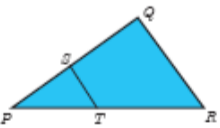
PHONE NUMBER : 9944249262

EMAIL: darthi99ktp@gmail.com

Centum Book Available

I. Multiple Choice Question.

13 x 1 = 13

- 1) The range of the relation $R = \{(x, x^2) \mid x \text{ is a prime number less than } 13\}$ is
 (a) $\{2,3,5,7\}$ (b) $\{2,3,5,7,11\}$ (c) $\{4,9,25,49,121\}$ (d) $\{1,4,9,25,49,121\}$
- 2) The sum of the exponents of the prime factors in the prime factorization of 1729 is
 (a) 1 (b) 2 (c) 3 (d) 4
- 3) If $A = \begin{pmatrix} 1 & 2 & 3 \\ 3 & 2 & 1 \end{pmatrix}$, $B = \begin{pmatrix} 1 & 0 \\ 2 & -1 \\ 0 & 2 \end{pmatrix}$ and $C = \begin{pmatrix} 0 & 1 \\ -2 & 5 \end{pmatrix}$, Which of the following statements are correct?
 (i) $AB + C = \begin{pmatrix} 5 & 5 \\ 5 & 5 \end{pmatrix}$
 (ii) $BC = \begin{pmatrix} 0 & 1 \\ 2 & -3 \\ -4 & 10 \end{pmatrix}$
 (iii) $BA + C = \begin{pmatrix} 2 & 5 \\ 3 & 0 \end{pmatrix}$
 (iv) $(AB)C = \begin{pmatrix} -8 & 20 \\ -8 & 13 \end{pmatrix}$
 (a) (i) and (ii) only (b) (ii) and (iii) only (c) (iii) and (iv) only (d) all of these
- 4) The value of $(1^3 + 2^3 + 3^3 + \dots + 15^3) - (1 + 2 + 3 + \dots + 15)$ is
 (a) 14400 (b) 14200 (c) 14280 (d) 14520
- 5) $\frac{3y-3}{y} \div \frac{7y-7}{3y^2}$ is
 (a) $\frac{9y}{7}$ (b) $\frac{9y^2}{(21y-21)}$ (c) $\frac{21y^2-42y+21}{3y^2}$ (d) $\frac{7(y^2-2y+1)}{y^2}$
- 6) In a given figure $ST \parallel QR$, $PS = 2$ cm and $SQ = 3$ cm. Then the ratio of the area of $\triangle PQR$ to the area $\triangle PST$ is

 (a) 25 : 4 (b) 25 : 7 (c) 25 : 11 (d) 25 : 13
- 7) Consider four straight lines
 (i) $l_1 : 3y = 4x + 5$
 (ii) $l_2 : 4y = 3x - 1$
 (iii) $l_3 : 4y + 3x = 7$
 (iv) $l_4 : 4x + 3y = 2$
 Which of the following statement is true?
 (a) l_1 and l_2 are perpendicular (b) l_1 and l_4 are parallel (c) l_2 and l_4 are perpendicular (d) l_2 and l_3 are parallel

- 8) If the radius of the base of a right circular cylinder is halved keeping the same height, then the ratio of the volume of the cylinder thus obtained to the volume of original cylinder is
 (a) 1:2 (b) 1:4 (c) 1:6 (d) 1:8
- 9) The point of intersection of $3x - y = 4$ and $x + y = 8$ is
 (a) (5, 3) (b) (2, 4) (c) (3, 5) (d) (4, 4)
- 10) If $x = a \tan \theta$ and $y = b \sec \theta$ then
 (a) $\frac{y^2}{b^2} - \frac{x^2}{a^2} = 1$ (b) $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$ (c) $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ (d) $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 0$
- 11) A shuttle cock used for playing badminton has the shape of the combination of
 (a) a cylinder and a sphere (b) a hemisphere and a cone (c) a sphere and a cone (d) frustum of a cone and a hemisphere
- 12) The sum of all deviations of the data from its mean is
 (a) Always positive (b) always negative (c) zero (d) non-zero integer
- 13) If function $f: N \rightarrow N$, $f(x) = 2x$ then the function is, then the function is _____
 (a) Not one - one and not onto (b) one-one and onto (c) Not one -one but not onto (d) one - one but not onto
- 14) If $\sin \theta + \cos \theta = a$ and $\sec \theta + \operatorname{cosec} \theta = b$, then the value of $b(a^2 - 1)$ is equal to
 (a) 2a (b) 3a (c) 0 (d) 2ab

II. Answer all question.

5 x 2 = 10

- 15) If $B \times A = \{(-2,3), (-2,4), (0,3), (0,4), (3,3), (3,4)\}$ find A and B.
- 16) If $f(x) = 3x - 2$, $g(x) = 2x + k$ and if $f \circ g = f \circ f$, then find the value of k..
- 17) If $A = \begin{bmatrix} 5 & 2 & 2 \\ -\sqrt{17} & 0.7 & \frac{5}{2} \\ 8 & 3 & 1 \end{bmatrix}$ then verify $(A^T)^T = A$
- 18) Find the range and coefficient of range of the following data: 25, 67, 48, 53, 18, 39, 44.
- 19) What is the probability that a leap year selected at random will contain 53 Saturdays. (Hint: $366 = 52 \times 7 + 2$)

III. Answer all question.

2 x 5 = 10

- 20) If the function $f: R \rightarrow R$ defined by

$$f(x) = \begin{cases} 2x + 7, & x < -2 \\ x^2 - 2, & -2 \leq x < 3 \\ 3x - 2, & x \geq 3 \end{cases}$$

- (i) $f(4)$
 (ii) $f(-2)$
 (iii) $f(4) + 2f(1)$
 (iv) $\frac{f(1) - 3f(4)}{f(-3)}$
- 21) Find x if $gff(x) = fgg(x)$, given $f(x) = 3x + 1$ and $g(x) = x + 3$.

Iv. Answer any 5 question.

4 x 8 = 32

- 22) a) Graph the following quadratic equations and state their nature of solutions.
 $x^2 + x + 7 = 0$

(OR)

- b) Varshika drew 6 circles with different sizes. Draw a graph for the relationship between the diameter and circumference of each circle as shown in the table and use it to find the circumference of a circle when its diameter is 6 cm.

| | | | | | |
|---------------------|-----|-----|-----|------|------|
| Diameter (x)cm | 1 | 2 | 3 | 4 | 5 |
| Circumference (y)cm | 3.1 | 6.2 | 9.3 | 12.4 | 15.5 |

- 23) a) Construct a $\triangle PQR$ such that $QR = 6.5$ cm, $\angle P = 60^\circ$ and the altitude from P to QR is of length 4.5 cm.

(OR)

- b) Draw the two tangents from a point which is 10 cm away from the centre of a circle of radius 5 cm. Also, measure the lengths of the tangents.

