



Sri Raghavendra Tuition Center

Pre Quaterly Exam

10th Standard

Maths

Date : 19-09-24

Reg.No. :

Exam Time : 03:00 Hrs

Total Marks : 100

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Centum Book Available

I. Multiple Choice Question

14 x 1 = 14

- 1) If $n(A \times B) = 6$ and $A = \{1,3\}$ then $n(B)$ is
(a) 1 (b) 2 (c) 3 (d) 6
- 2) If the ordered pairs $(a + 2, 4)$ and $(5, 2a + b)$ are equal then (a, b) is
(a) (2,-2) (b) (5,1) (c) (2,3) (d) (3,-2)
- 3) 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
- 4) $A = \{a, b, p\}$, $B = \{2, 3\}$, $C = \{p, q, r, s\}$ then $n[(A \cup C) \times B]$ is
(a) 8 (b) 20 (c) 12 (d) 16
- 5) If the HCF of 65 and 117 is expressible in the form of $65m - 117$, then the value of m is
(a) 4 (b) 2 (c) 1 (d) 3
- 6) Given $F_1 = 1$, $F_2 = 3$ and $F_n = F_{n-1} + F_{n-2}$ then F_5 is
(a) 3 (b) 5 (c) 8 (d) 11
- 7) An A.P. consists of 31 terms. If its 16th term is m , then the sum of all the terms of this A.P. is
(a) $16m$ (b) $62m$ (c) $31m$ (d) $\frac{31}{2}m$
- 8) If $(x - 6)$ is the HCF of $x^2 - 2x - 24$ and $x^2 - kx - 6$ then the value of k is
(a) 3 (b) 5 (c) 6 (d) 8
- 9) The square root of $\frac{256x^8y^4z^{10}}{25x^6y^6z^6}$ is equal to
(a) $\frac{16}{5} \left| \frac{x^2z^4}{y^2} \right|$ (b) $16 \left| \frac{y^2}{x^2z^4} \right|$ (c) $\frac{16}{5} \left| \frac{y}{xz^2} \right|$ (d) $\frac{16}{5} \left| \frac{xz^2}{y} \right|$
- 10) Which of the following should be added to make $x^4 + 64$ a perfect square
(a) $4x^2$ (b) $16x^2$ (c) $8x^2$ (d) $-8x^2$
- 11) The number of points of intersection of the quadratic polynomial $x^2 + 4x + 4$ with the X axis is
(a) 0 (b) 1 (c) 0 or 1 (d) 2
- 12) Graph of a linear equation is a _____
(a) straight line (b) circle (c) parabola (d) hyperbola
- 13) If in triangles ABC and EDF, $\frac{AB}{DE} = \frac{BC}{FD}$ then they will be similar, when
(a) $\angle B = \angle E$ (b) $\angle A = \angle D$ (c) $\angle B = \angle D$ (d) $\angle A = \angle F$

- 14) The area of triangle formed by the points $(-5, 0)$, $(0, -5)$ and $(5, 0)$ is
 (a) 0 sq. units (b) 25 sq. units (c) 5 sq. units (d) none of these
- 15) The slope of the line which is perpendicular to a line joining the points $(0, 0)$ and $(-8, 8)$ is
 (a) -1 (b) 1 (c) $\frac{1}{3}$ (d) -8

II. Answer any 10 question.

10 x 2 = 20

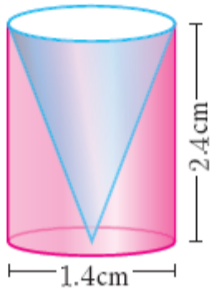
- 16) If $A \times B = \{(3,2), (3, 4), (5,2), (5, 4)\}$ then find A and B.
- 17) If $B \times A = \{(-2,3), (-2,4), (0,3), (0,4), (3,3), (3,4)\}$ find A and B.
- 18) if m, n are natural numbers, for what values of m, does $2^n \times 5^m$ ends in 5?
- 19) If $13824 = 2^a \times 3^b$ then find a and b.
- 20) Let $A = \{1, 2, 3, 4, \dots, 45\}$ and R be the relation defined as "is square of a number" on A. Write R as a subset of $A \times A$. Also, find the domain and range of R.
- 21) For what values of natural number n, 4^n can end with the digit 6?
- 22) Check whether the following sequences are in A.P.
 $a - 3, a - 5, a - 7, \dots$
- 23) Find x, y and z, given that the numbers x, 10, y, 24, z are in A.P.
- 24) Find the sum and product of the roots for each of the following quadratic equations:
 $x^2 + 8x - 65 = 0$
- 25) Solve $2x^2 - 3x - 3 = 0$ by formula method.
- 26) Find the excluded values of the following expressions (if any).
 $\frac{7p+2}{8p^2+13p+5}$
- 27) Find the area of the triangle formed by the points $(1, -1)$, $(-4, 6)$ and $(-3, -5)$
- 28) Simplify
 $\frac{x+2}{4y} \div \frac{x^2-x-6}{12y^2}$
- 29) Find the number of terms in the following G.P.
 $4, 8, 16, \dots, 8192$
- 30) Prove that $\tan^2\theta - \sin^2\theta = \tan^2\theta \sin^2\theta$
- 31) A cylindrical drum has a height of 20 cm and base radius of 14 cm. Find its curved surface area and the total surface area.

III. Answer any 10 question.

- 32) 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 $f(x) = 3x - 1$. Represent this function
 (i) by arrow diagram
 (ii) in a table form
 (iii) as a set of ordered pairs
 (iv) in a graphical form
- 33) Let $A = \{x \in \mathbb{N} \mid 1 < x < 4\}$, $B = \{x \in \mathbb{W} \mid 0 \leq x < 2\}$ and $C = \{x \in \mathbb{N} \mid x < 3\}$ Then verify that
 (i) $A \times (B \cup C) = (A \times B) \cup (A \times C)$
 (ii) $A \times (B \cap C) = (A \times B) \cap (A \times C)$
- 34) If the function $f: \mathbb{R} \rightarrow \mathbb{R}$ 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) $\frac{f(1) - 3f(4)}{f(-3)}$
- 35) Find the HCF of 396, 504, 636.

- 36) Find the sum to n terms of the series
 $3 + 33 + 333 + \dots$ to n terms
- 37) The sum of three consecutive terms that are in A.P. is 27 and their product is 288. Find the three terms.
- 38) Find the sum of
 $9^3 + 10^3 + \dots + 21^3$
- 39) Find the square root of the following expressions
 $16x^2 + 9y^2 - 24xy + 24x - 18y + 9$
- 40) Show that the points P(-1, 5, 3), Q(6, -2), R(-3, 4) are collinear.
- 41) If $A = \begin{bmatrix} 3 & 1 \\ -1 & 2 \end{bmatrix}$ show that $A^2 - 5A + 7I_2 = 0$
- 42) From a solid cylinder whose height is 2.4 cm and diameter 1.4 cm, a conical cavity of the same height and base is hollowed out. Find the total surface area of the remaining solid.



- 43) The product of Kumaran's age (in years) two years ago and his age four years from now is one more than twice his present age. What is his present age?
- 44) Given that $A = \begin{bmatrix} 1 & 3 \\ 5 & -1 \end{bmatrix}$, $B = \begin{bmatrix} 1 & -1 & 2 \\ 3 & 5 & 2 \end{bmatrix}$, $C = \begin{bmatrix} 1 & 3 & 2 \\ -4 & 1 & 3 \end{bmatrix}$ verify that $A(B + C) = AB + AC$.
- 45) If $A = \begin{bmatrix} 5 & 2 & 9 \\ 1 & 2 & 8 \end{bmatrix}$, $B = \begin{bmatrix} 1 & 7 \\ 1 & 2 \\ 5 & -1 \end{bmatrix}$ verify that $(AB)^T = B^T A^T$

IV. Answer all question.

2 x 8 = 16

- 46) Draw the graph of $y = x^2 + 4x + 3$ and hence find the roots of $x^2 + x + 1 = 0$
- 47) 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 |
- 48) Construct a $\triangle PQR$ in which $QR = 5$ cm, $\angle P = 40^\circ$ and the median PG from P to QR is 4.4 cm. Find the length of the altitude from P to QR .
- 49) Draw a circle of diameter 6 cm from a point P , which is 8 cm away from its centre. Draw the two tangents PA and PB to the circle and measure their lengths.

All the best
