

V

FIRST REVISION TEST - 2023

STANDARD X

Maths

Part - I

Time: 3.00 Hours

Marks:100

Answer all the questions:

14×1=14

- 1) If $A = \{1, 2\}$, $B = \{1, 2, 3, 4\}$, $C = \{5, 6\}$ and $D = \{5, 6, 7, 8\}$ then state which of the following statement is true
 - a) $(A \times C) \subset (B \times D)$
 - b) $(B \times D) \subset (A \times C)$
 - c) $(A \times B) \subset (A \times D)$
 - d) $(D \times A) \subset (B \times A)$
- 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)
 - d) $(3, -2)$
- 3) If $f(x) = 2x^2$ and $g(x) = \frac{1}{3x}$, then fog is
 - a) $\frac{3}{2x^2}$
 - b) $\frac{2}{3x^2}$
 - c) $\frac{2}{9x^2}$
 - d) $\frac{1}{6x^2}$
- 4) If $g = \{(1, 1), (2, 3), (3, 5), (4, 7)\}$ is a function given by $g(x) = \alpha x + \beta$ then the values of α and β are
 - a) $(-1, 2)$
 - b) $(2, -1)$
 - c) $(-1, -2)$
 - d) $(1, 2)$
- 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) The least number that is divisible by all the numbers from 1 to 10 (both inclusive) is
 - a) 2025
 - b) 5220
 - c) 5025
 - d) 2520
- 7) The first term of an arithmetic progression is unity and the common difference is 4. Which of the following will be a term of this A.P.
 - a) 4551
 - b) 10091
 - c) 7881
 - d) 13531
- 8) $y^2 + \frac{1}{y^2}$ is not equal to
 - a) $\frac{y^2 + 1}{y^2}$
 - b) $\left(y + \frac{1}{y}\right)^2$
 - c) $\left(y - \frac{1}{y}\right)^2 + 2$
 - d) $\left(y + \frac{1}{y}\right)^2 - 2$
- 9) The values of a and b if $4x^4 - 24x^3 + 76x^2 + ax + b$ is a perfect square are
 - a) 100, 120
 - b) 10, 12
 - c) -120, 100
 - d) 12, 10

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x - Maths

- 10) Graph of a linear polynomial is a _____
a) Straight line
b) circle
c) parabola
d) hyperbola
- 11) Transpose of a column matrix is
a) unit matrix
b) diagonal matrix
c) column matrix
d) row matrix
- 12) If ΔABC is an isosceles triangle with $\angle C = 90^\circ$ and $AC = 5$ cm, then AB is
a) 2.5 cm
b) 5 cm
c) 10 cm
d) $5\sqrt{2}$ cm
- 13) In a ΔABC , AD is the bisector $\angle BAC$. If $AB = 8$ cm, $BD = 6$ cm and $DC = 3$ cm. The length of the side AC is
a) 6 cm
b) 4 cm
c) 3 cm
d) 8 cm
- 14) The two tangents from an external points P to a circle with centre at O are PA and PB . If $\angle APB = 70^\circ$ then the value of $\angle AOB$ is
a) 100°
b) 110°
c) 120°
d) 130°

Part - II

Answer any 10 Questions. Question No.28 is compulsory. $10 \times 2 = 20$

- 15) Let $A = \{1, 2, 3\}$ and $B = \{x \mid x \text{ is a prime number less than } 10\}$. Find $A \times B$ and $B \times A$.
- 16) If $A = \{-2, -1, 0, 1, 2\}$ and $f: A \rightarrow B$ is an onto function defined by $f(x) = x^2 + x + 1$ then find B .
- 17) If the ordered pairs $(x^2 - 3x, y^2 + 4y)$ and $(-2, 5)$ are equal, then find x and y .
- 18) Using the functions f and g given below, find $f \circ g$ and $g \circ f$. Check whether $f \circ g = g \circ f$ $f(x) = \frac{x+6}{3}$, $g(x) = 3-x$
- 19) Show that the square of an odd integer is of the form $4q + 1$, for some integer q .
- 20) For what values of natural number n , 4^n can end with the digit 6?
- 21) Solve $5x \equiv 4 \pmod{6}$
- 22) Check whether the following sequences are in A.P.
 $a - 3, a - 5, a - 7, \dots$
- 23) In a G.P. 729, 243, 81, find t_7 .

24) Simplify

$$\frac{x(x+1)}{x-2} + \frac{x(1-x)}{x-2}$$

25) Find the square root of the following

$$4x^2 + 20x + 25$$

26) Find the value of a, b, c, d from the following matrix equation.

$$\begin{bmatrix} d & 8 \\ 3b & a \end{bmatrix} + \begin{bmatrix} 3 & a \\ -2 & -4 \end{bmatrix} = \begin{bmatrix} 2 & 2a \\ b & 4c \end{bmatrix} + \begin{bmatrix} 0 & 1 \\ -5 & 0 \end{bmatrix}$$

27) Δ LMN is a right-angled triangle with $L = 90^\circ$. A circle is inscribed in it. The lengths of the side containing the right angle are 6 cm and 8 cm. Find the radius of the circle.

28) In two concentric circles, a chord of length 16 cm of larger circle becomes a tangent to the smaller circle whose radius is 6 cm. Find the radius of the larger circle.

Part - III

Answer any 10 Questions. Question No.42 is compulsory. $10 \times 5 = 50$

29) 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?

30) The function 't' which maps temperature in Celsius (C) into temperature in Fahrenheit (F) is defined by $t(C) = F$ where $F = \frac{9}{5}C + 32$. Find,
(i) $t(0)$ (ii) $t(28)$ (iii) $t(-10)$ (iv) the value of C when $t(C) = 212$.
(v) the temperature when the Celsius value is equal to the Fahrenheit value.

31) Let $f: A \rightarrow B$ be a function defined by $f(x) = x/2 - 1$, where $A = \{2, 4, 6, 10, 12\}$, $B = \{0, 1, 2, 4, 5, 9\}$. Represent f by
(i) set of ordered pairs (ii) a table (iii) an arrow diagram (iv) a graph.

32) Find the value of k, such that $f \circ g = g \circ f$ $f(x) = 2 - k$, $g(x) = 4x + 5$.

33) If d is the Highest Common of 32 and 60, find x and y satisfying $d = 32x + 60y$.

34) Find the remainder when 2^{81} is divided by 17.

35) A mother divides Rs. 207 into three parts such that the amount are in A.P. and gives it to her three children. The product of the two least amounts that the children had Rs.4623. Find the amount received by each child.

36) Find the sum of the following series $10^3 + 11^3 + 12^3 + \dots + 20^3$.

37) Find the square root of $64^4 - 16^3 + 17x^2 - 2x + 1$

38) The hypotenuse of a right angled triangle is 25 cm and its perimeter 56 cm. Find the length of the smallest side.

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X - Maths

39) 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 $A(B+C) = AB + AC$.

- 40) 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 3.6 m above the ground, find the length of his shadow cast after 4 seconds.
- 41) 5 m long ladder is placed leaning towards a vertical wall such that it reaches the wall at a point 4m high. If the foot of the ladder is moved 1.6m towards the wall, then find the distance by which the top of the ladder would slide upwards on the wall.
- 42) Basic Proportionality Theorem (BPT) or Thales theorem?

Part - IV

Answer all the questions.

2×8=16

- 43) a) A company initially started with 40 workers to complete the work by 150 days. Later, it decided to fasten up the work increasing the number of workers as shown below.

Number of workers	(x)	40	50	60	75
Number of days	(y)	150	120	100	80

- (i) Graph the above data and identify the type of variation.
- (ii) From the graph, find the number of days required to complete the work if the company decides to opt for 120 workers?
- (iii) If the work has to be completed by 200 days, how many workers are required?

[or]

- b) A garment shop announces a flat 50% discount on every purchase of items for their customers. Draw the graph for the relation between the Marked Price and the Discount. Hence find

- (i) the marked price when a customer gets a discount of Rs.3250 (from graph)
- (ii) the discount when the marked price Rs.2500.

- 44) a) Construct a ΔPQR 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) 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 $\frac{3}{5} < 1$)
