

COMMON FIRST MID TERM TEST - 2023

B

Standard X

Reg.No.

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MATHEMATICS

Time : 1.30 hrs

Part - I

Marks : 50

I. Choose the correct answer:

7 x 1 = 7

1. If the ordered pairs $(a+3, 4)$ and $(5, 2a+b)$ are equal, then (a, b) is
 - a) $(2, -2)$
 - b) $(5, 1)$
 - c) $(2, 3)$
 - d) $(3, -2)$
2. If $f: A \rightarrow B$ is a bijective function and $n(B) = 7$, then $n(A)$ is equal to
 - a) 7
 - b) 49
 - c) 1
 - d) 14
3. The least number that is divisible by all integers from 1 to 10 (both inclusive) is
 - a) 2025
 - b) 5220
 - c) 5025
 - d) 2520
4. The remainder when $7 \times 13 \times 19 \times 23 \times 29 \times 31$ is divided by 6 is
 - a) 0
 - b) 1
 - c) 2
 - d) 3
5. If 6 times of 6th term of an A.P is equal to 7 times of 7th term, then the 13th term of AP is
 - a) 0
 - b) 6
 - c) 7
 - d) 13
6. $(2, 1)$ is the point of intersection of two lines.
 - a) $x - y - 3 = 0; 3x - y - 7 = 0$
 - b) $x + y = 3; 3x + y = 7$
 - c) $3x + y = 3; x + y = 7$
 - d) $x + 3y - 3 = 0; x - y - 7 = 0$
7. Find the equation of straight line whose slope is 5 and x intercept is -9
 - a) $5x - y - 9 = 0$
 - b) $5x - y + 45 = 0$
 - c) $5x + y - 9 = 0$
 - d) $5x + y - 45 = 0$

Part - II

II. Answer any 5 questions. (Q.No.14 is compulsory)

5 x 2 = 10

8. If $A \times B = \{(3,2), (3,4), (5,2), (5,4)\}$ then find A and B.
9. A function f is defined by $f(x) = 3 - 2x$, find x such that $f(x^2) = [f(x)]^2$
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. Find the sum to infinity of $9 + 3 + 1 + \dots$
12. Find the equation of a straight line passing through $[5, 7]$ and is
 - i) Parallel to x axis
 - ii) Parallel to y axis

13. Find the intercepts made by the line $4x + 3y + 12 = 0$ on the coordinate axes.

14. If $12500 = a^a \times b^b$, $b > a$, then find the value of 'a' and 'b'.

Part - III

III. Answer any 5 questions. (Q.No.21 is compulsory)

15. 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

16. If the function f is defined by $f(x) = \begin{cases} x+2 & \text{if } x > 1 \\ 2 & \text{if } -1 \leq x \leq 1 \\ x-1 & \text{if } -3 < x < -1 \end{cases}$, find the value of

i) $f(3)$

ii) $f(0)$

iii) $f(-1.5)$

iv) $f(2) + f(-2)$

17. If $f(x) = x - 1$, $g(x) = 3x + 1$, $h(x) = x^2$, show that $(f \circ g) \circ h = f \circ (g \circ h)$

18. A mother divides ₹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 ₹4623. Find the amount received by each child.

19. You are downloading a song. The percent y (in decimal form) of mega bytes remaining to get downloaded in x seconds is given by $y = -0.1x + 1$.

i) Find the total MB of the song.

ii) After how many seconds will 75% of the song gets downloaded?

iii) After how many seconds the song will be downloaded completely.

20. Find the area of the quadrilateral whose vertices are at $(8, 6)$ $(5, 11)$ $(-5, 12)$ $(-4, 3)$

21. Find the total area of 12 squares whose sides are 12 cm, 13 cm 23 cm consecutively.

Part - IV

IV. Answer correctly with diagram.

$1 \times 8 = 8$

22. a) Construct a ΔPQR in which $PQ = 8$ cm, $\angle R = 60^\circ$ and the median RG from R to PQ is 5.8 cm. Find the length of the altitude from R to PQ .

(OR)

b) Draw the graph of $xy = 24$, $x, y > 0$. Using this graph

i) When $x = 3$, find the value of 'y'

ii) When $y = 6$, find the value of 'x'.

$$\begin{array}{r} 23 \times 4 \\ \hline 92 \end{array}$$

$$\begin{array}{r} 92 \times 47 \\ \hline 1644 \end{array}$$

$$\begin{array}{r} 22 \times 23 \\ \hline 44 \times \\ \hline 506 \end{array}$$

$$\begin{array}{r} 22 \times 23 \\ \hline 166 \\ 44 \times \\ \hline 506 \end{array}$$

$$\begin{array}{r} 4324 \\ 506 \\ \hline 3818 \end{array}$$