

XI

EXAM No: 8

Max Time. 2hr 15 Min
Max Marks 66

CHAPTER: SETS

Marks: 29
Time: 45 Min

Q. No. 1 write in Roster form

(1M) $A = \{x : x \text{ is a two digit number such that the sum of its digits is } 8\}$

Q. No. 2 \rightarrow Given $A = \{0, 1, 2\}$ and $B = \{x \in \mathbb{R} : 0 \leq x \leq 2\}$
(1M) then

(1) $A = B$ (2) $A \subset B$ (3) $B \subset A$ (4) $A \in B$

Q. No. 3 \rightarrow If $A = \emptyset$, then the number of elements of $P(P(A))$ is
(1M)

(A) 1 (B) 2 (C) 4 (D) 8

Q. No. 4 \rightarrow Let $A = \{1, 2, \{3, 4\}, 5\}$ then which of the following is correct?
(1M)

(A) $1 \subset A$ (B) $3 \in A$ (C) $\{3, 4\} \subset A$ (D) $\{\{3, 4\}\} \subset A$

Q. No. 5 Is it true that for any sets A & B
(2M) $P(A) \cup P(B) = P(A \cup B)$? Justify your answer.

Q. No. 6 \rightarrow Let $T = \{x : \frac{x+5}{x-7} = 5 + \frac{4x-40}{13-x}\}$
(2M) write set T

Q. No. 7 out of 500 car owners investigated, 400
(2M) owned car A and 200 owned car B, 50
owned both A and B. Is the data

correct? Justify your answer.

Q. 8 → There are 40 students in a chemistry class
(4M) and 60 students in a physics class. Find the number of students which are either in physics class or chemistry class in the following cases:

- (i) The two classes meet at the same hour
- (ii) the two classes meet at different hours and 20 students are enrolled in both the subjects.

Q. 9 → In a class of 35 students, 17 have taken
(4M) mathematics, 10 have taken mathematics but not economics. Find the number of students who have taken both mathematics and economics and the number of students who have taken economics but not mathematics, if it is given that each student has taken either mathematics or economics or both.

Q. 10 → In a survey of 100 persons/students. The number
(4M) of students studying various languages were found to be: English only 18, English but not Hindi 23, English and Sanskrit 8, English 26, Sanskrit 48, Sanskrit and Hindi 8, no language 24.
Find (i) No. of students studying Hindi.
(2) No. of students studying English and Hindi.

Q.1 → let $f = \{(0,1), (2,0), (3,-4), (4,2), (5,1)\}$
 (1M) and $g = \{(1,0), (2,2), (3,-1), (4,4), (5,3)\}$
 then write domain of $f-g =$ _____

Q.2 → The domain for which the functions defined
 (1M) by $f(x) = 3x^2 - 1$, and $g(x) = 3 + x$ are equal is
 (A) $[-1, \frac{4}{3}]$ (B) $[-1, \frac{4}{3}]$ (C) $\{-1, \frac{4}{3}\}$ (D) $\{1, -\frac{3}{2}\}$

Q.3 → If $n(A) = p$ and $n(B) = q$, then the total
 (1M) number of non-empty relations that can be
 defined from A to B is

(A) 2^{pq} (B) 2^{p^2} (C) $2^{p^2} - 1$ (D) $p^2 - 1$

Q.4 → let $R = \{(x, y) : y = 2x + 7 ; x \in R ; -5 \leq x \leq 5\}$
 (1M) write the Range of R

Q.5 → The function f is defined by
 (2M) $f(x) = \begin{cases} 1-x & x < 0 \\ 1 & x = 0 \\ x+1 & x > 0 \end{cases}$ Draw the graph of $f(x)$

Q.6 → write the domain of $f(x) = \frac{1}{\sqrt{x-|x|}}$
 (2M)

Q. 7 write domain and range of function
(2M)

$$f(x) = \frac{x-3}{|x-3|}$$

Q. 8 write domain and range of function
(4M)

$$f(x) = \frac{1}{\sqrt{16-x^2}}$$

Q. 9 → write domain and range of

$$f(x) = \frac{1}{1-2\cos x}$$

(OR)

$$f(x) = \frac{1}{2-\sin(3x)}$$

Q. 10 → (i) If $f(x) = \frac{x-1}{x+1}$, then show that
(4M)

$$(i) f\left(\frac{1}{x}\right) = -f(x)$$

$$(ii) f\left(-\frac{1}{x}\right) = \frac{-1}{f(x)}$$

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Qn. 1 If $a < b$ and $c < 0$

(1M) then $\frac{a}{c} \text{ --- } \frac{b}{c}$ { ~~find~~ Fill in the blank }

Qn. 2 \rightarrow Solve $-12 < 4 - \frac{3x}{-5} \leq 2$
(1M) write in Intervals

Qn. 3 If $|x-1| > 5$ then $x \in \underline{\hspace{2cm}}$
(1M) (Fill in the blank)

Qn. 4 Solve $3x+8 > 2$ when x is an integer
(1M)

Qn. 5 IQ = $\frac{MA}{CA} \times 100$
(2M)

when MA is Mental Age and CA is Chronological age. If $80 \leq IQ \leq 140$ for a group of 12 year old children. Find the range of Mental age.

Qn. 6 \rightarrow The longest side of a triangle is twice the shortest side and the third side is 2cm longer than the shortest side. If the perimeter of the triangle is more than 166 cm then find the minimum length of the shortest side.
(2M)

Qn. 7
(2M) Solve the system of inequalities (Find common solution)

$$\frac{2x-3}{4} + 9 \geq 3 + \frac{4x}{3} \quad \text{and}$$

$$\frac{5x-2}{3} - \frac{7x-3}{5} > \frac{x}{4}$$

Qn. 8 →
(4M) How many litres of water will have to be added to 1125 litres of the 45% solution of acid so that the resulting mixture will contain more than 25% but less than 30% acid content?

Qn. 9 →
(4M) Soln graphically

$$3x + 2y \leq 150; \quad x + 4y \leq 80; \quad x \leq 15; \quad x, y \geq 0$$

Qn. 10 →
(4M) Solve

$$\frac{|x-2| - 1}{|x-2| - 2} \leq 0$$

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