

Model Question Paper
Sets and Functions - Part I

10th Standard

Maths

Reg.No. :

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I. Answer all the questions.

II. Use Blue pen only.

Time : 01:15:00 Hrs

Total Marks : 50

4 x 1 = 4

Section-A

- 1) If $n[p(A)] = 64$, then $n(A)$ is
(a) 6 (b) 8 (c) 4 (d) 5
- 2) For any three sets A, B and C, $A \cap (B \cup C)$ is
(a) $(A \cup B) \cup (B \cap C)$ (b) $(A \cap B) \cup (A \cap C)$ (c) $A \cup (B \cap C)$ (d) $(A \cup B) \cap (B \cap C)$
- 3) For any two sets A and B, $(A \setminus B) \cup (B \setminus A) \cap (A \cap B)$ is
(a) \emptyset (b) $A \cup B$ (c) $A \cap B$ (d) $A' \cap B'$
- 4) Which one of the following is not true?
(a) $A \setminus B = A \cap B'$ (b) $A \setminus B = A \cap B$ (c) $A \setminus B = (A \cup B) \cap B'$ (d) $A \setminus B = (A \cup B) \setminus B$

Section-B

8 x 2 = 16

- 5) Let $P = \{a, b, c\}$, $Q = \{g, h, x, y\}$ and $R = \{a, e, f, s\}$. Find the following: $P \setminus R$.
- 6) If $A = \{4, 6, 7, 8, 9\}$, $B = \{2, 4, 6\}$ and $C = \{1, 2, 3, 4, 5, 6\}$, then find $A \cup (B \cap C)$.
- 7) Given $A = \{a, x, y, r, s\}$, $B = \{1, 3, 5, 7, -10\}$ Verify the commutative property of set union :
- 8) Verify the commutative property of set intersection for
 $A = \{l, m, n, o, 2, 3, 4, 7\}$, and $B = \{2, 5, 3, -2, m, n, o, p\}$
- 9) If A and B are two sets and U is the Universal set such that $n(U) = 700$, $n(A) = 200$, $n(B) = 300$, and $n(A \cap B) = 100$, find $n(A' \cap B')$.
- 10) Given $n(A) = 285$, $n(B) = 195$, $n(U) = 500$, $n(A \cup B) = 410$, find $n(A' \cup B')$.

Section-C

5 x 5 = 25

- 11) Let $U = \{-2, -1, 0, 1, 2, 3, \dots, 10\}$, $A = \{-2, 2, 3, 4, 5\}$ and $B = \{1, 3, 5, 8, 9\}$. Verify De Morgan's laws of complementation.
- 12) Let $A = \{a, b, c, d, e, f, g, x, y, z\}$, $B = \{1, 2, c, d, e\}$ and $C = \{d, e, f, g, 2, y\}$. Verify $A \setminus (B \cup C) = (A \setminus B) \cap (A \setminus C)$
- 13) In a group of students, 65 play foot ball, 45 play hockey, 42 play cricket, 20 play foot ball and hockey, 25 play foot ball and cricket, 15 play hockey and cricket and 8 play all the three games. Find the number of students in the group.
(Assume that each student in the group plays atleast one game.)
- 14) In a survey of university students, 64 had taken mathematics course, 94 had taken computer science course, 58 had taken physics course, 28 had taken mathematics and physics, 26 had taken mathematics and computer science, 22 had taken computer science and physics course, and 14 had taken all the three courses. Find the number of students who were surveyed. Find how many had taken one course only.
- 15) A radio station surveyed 190 students to determine the types of music they liked. The survey revealed that 114 liked rock music, 50 liked folk music, and 41 liked classical music, 14 liked rock music and folk music, 15 liked rock music and classical music, 11 liked classical music and folk music. 5 liked all the three types of music. Find (i) how many did not like any of the 3 types?
(ii) how many liked any two types only?
(iii) how many liked folk music but not rock music?
- 16) a) For any three sets A, B and C if $n(A) = 17$, $n(B) = 17$, $n(C) = 17$, $n(A \cap B) = 7$, $n(B \cap C) = 6$, $n(A \cap C) = 5$ and $n(A \cap B \cap C) = 2$, find $n(A \cup B \cup C)$.

b)

Does each of the following arrow diagrams represent a function? Explain.


