

Discrete Mathematics Assignment

classmate

Date _____

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- Q1. (i) 4, 5, 6, 7, 8
(ii) 2, 4, 6, 8, 10
(iii) No such value of n exists

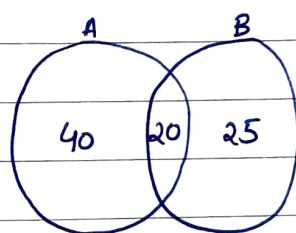
- Q2. (i) $A = \{2, 3, 4, 5\}$
 $B = \{2, 4, 6, 8, 10, \dots\}$

As, all elements of A are not present in B . $\therefore A$ is not a subset of B .

- (ii) $C = \{1, 2, 3, 4, 5, 6, 7, 8, 9\}$

As, all elements of A are present in set C . $\therefore A$ is a proper subset of C .

Q3.



- (i) 85
(ii) 65
(iii) 55

Q4. (a) $A = (B^c \cup A) \cap (A \cup B)$

(b) $(A \cup B) \cap (A^c \cup B) \cap (A \cup B^c) \cap (A^c \cup B^c) = \phi$

Q5. (a) $(A \cap B) \cup (A \cap B^c) = A$
 $= [(A \cap B) \cup A] \cap [(A \cap B) \cup B^c]$
 $= A \cap A$
 $= A$

{ Using association and absorption Laws }

$$(b) (A \cap B^c) \cup (A^c \cap B) \cup (A \cap B) = A \cup B$$

$$= [(A \cap B^c) \cup A^c] \cap [(A \cap B^c) \cup B] \cup (A \cap B)$$

$$= [U - (A \cap B)] \cap [A \cup B]$$

$$= [(A \cup B) - (A \cap B)] \cup (A \cap B)$$

$$= A \cup B$$

{ Using association & absorption Laws }

$$(Q6. \quad \overline{A \cup (B \cap C)})$$

$$= \bar{A} \cap \overline{(B \cap C)}$$

$$= \bar{A} \cap [\bar{B} \cup \bar{C}]$$

{ Using De Morgan's Law }

Q.7. (a) True

(b) False

(c) True

(d) True

(e) True

(f) False

(g) True

(h) True

(i) False

$$Q.8. (a) \{ \{2, 1, 1\}, \{2, 1, 2\}, \{2, 1, \{3\}\}, \{2, 2, 1\}, \{2, 2, 2\}, \{2, 2, \{3\}\} \}$$

$$(b) \{ \{ \phi, 1 \}, \{ 1, 1 \}, \{ \phi, 2 \}, \{ 1, 2 \} \}$$

$$(c) \{ \{ \phi, 1 \}, \{ 1, 1 \}, \{ 2, 1 \}, \{ 3, 1 \}, \{ 1, 2, 1 \}, \{ 1, 3, 1 \}, \{ 2, 3, 1 \}, \{ 1, 2, 3, 1 \} \}$$

$$Q9. \quad A \cap B^c = \{ 3, 5, 7 \}$$

$$Q10. \quad A = \{ 1, 3, 5, 7, 9 \}$$

$$B = \{ 1, 2, 3, 4, 5 \}$$

$$A \cup B = \{ 1, 2, 3, 4, 5, 7, 9 \}$$

$$A \cap B = \{ 1, 3, 5 \}$$

bit string of A if $U = \{1, 2, 3, 4, 5, 6, 7, 8, 9\}$

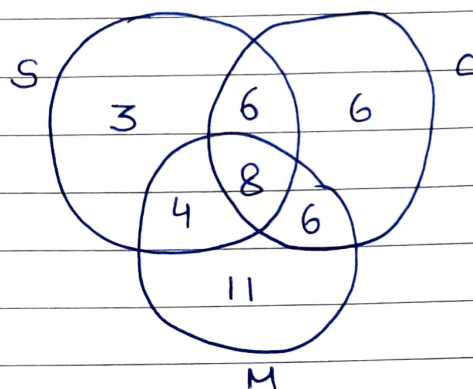
$$A = \{101010101\}$$

$$B = \{111110000\}$$

$$A \cup B = \{111110101\}$$

$$A \cap B = \{101010000\}$$

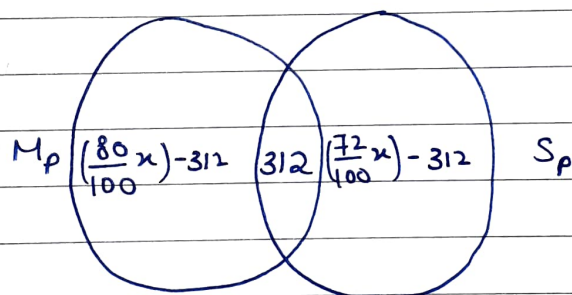
Q10.



(a) 24

(b) 36

Q11.



$$\text{Failed} = \frac{13x}{100}$$

Let total students be x .

$$\therefore \frac{80x}{100} - 312 + 312 + \frac{72x}{100} - 312 + \frac{13x}{100} = x$$

$$0.8x + 0.72x + 0.13x - 312 = x$$

$$1.65x - x = 312$$

$$0.65x = 312$$

$$x = \frac{312 \times 100}{65} = 480$$

\therefore Total no. of students = 480