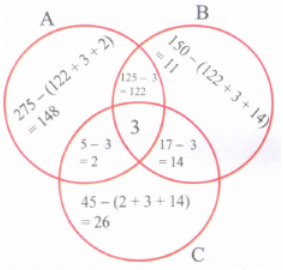
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Answers Key:

5 Marks

1. (i) A-B = {3,4,6}
   (ii) B-C = {-1,5,7}
   (iii) A′UB′
   A′UB′
   A′ = {1,2,0,-3,5,7,8}
   B′ = {-3,0,1,2,3,4,5,6}
   A′UB′ = {-3,0,1,2,3,4,5,6,7,8}
   (iv) A′∩B′
   A′∩B′ = {-3,0,1,2}
   (v) (BUC)′
   BUC = {-3,-2,-1,0,3,5,7,8}
   (BUC)′ = U-(BUC)
   = {-3,-2,-1,0,1,2,3,4,5,6,7,8} - {-3,-2,-1,0,3,5,7,8}
   (BUC)′ = {1,2,4,6}
   (vi) A-(BUC) = {-2,-1,3,4,6} - {-3,-2,-1,0,3,5,7,8} = {4,6}
   (vii) A-(B∩C)
   B∩C = {-2,8}
   A-(B∩C) = {-2,-1,3,4,6} - {-2,8} = {-1,3,4,6}
2. Tamil Newspaper buyers n(A) = 275
   English Newspaper buyers n(B) = 150
   Hindi Newspaper buyers n(C) = 45
   n (A∪ B ∪ C) = n(A) + n(B) + n(C) - n(A∩B) - n(B∩C) - n(A∩C) + n(A∩B∩C)
   Tamil and English Newspaper buyers n(A∩B) = 125
   English and Hindi Newspaper buyers n(B∩C) = 17
   Hindi and Tamil Newspaper buyers n(C∩A) = 5
   All the three Newspaper buyers n(A∩B∩C) = 3



   (i) Number of families buy only one newspaper = 148 + 11 + 26 = 185
   (ii) Number of families buy atleast two news papers = 122 + 14 + 2 + 3 = 141
   (iii) Total number of families in the colony = 148 + 11 + 26 + 122 + 14 + 2 + 3 = 326
3. a = 600 - (120 -x + x + 80 -x)
   = 600 - (200 -x)
   = 600 - 200 + x = 400 + x
   b = 350 - (120 -x + x + 100 -x)
   = 350 - (220 - x)
   = 350 - 230 + x = 130 + x
   c = 280 - (80 - x + x + 100 - x)
   2800 - (180 -x)
   = 280 - 180 + x = 100 + x
   Each farmer grew atleast one of the above three, the number of farmers who grew all the three is x.
   = a + b + c + 120 - x + 100 - x + 80 - x + x = 1000
   400 + x + 130 + x + 100 + x + 120 - x + 100 - x + 80 - x + x = 1000
   ∴ 930 + x = 1000
   x = 1000 - 930 = 70
   ∴ 70 farmers grew all the three crops.
4. Let the people who like tea be T.
   Let the people who like coffee be C
   By using formula
   n(A ∪ B) = n(A) + n(B) − n(A ∩ B)
   (i) n(T ∩ C) = n(T) + n(C) − n(T ∪ C) = 35 + 20 − 45 = 55 − 45 = 10
   The number of people who like both coffee and tea = 10.

(ii) The number of people who do not like tea
n(T) = n(U) − n(T) = 45 − 35 = 10
(iii) The number of people who do not like coffee
n(C) = n(U) − n(C) = 45 − 20 = 25.

5. Let A be the set of people owned car A
Let B be the set of people owned car B
n(A) = 400, n(B) = 200, n(A ∩ B) = 50
n(A ∪ B) = 500 .....(1)
n(A) + n(B) - n(A ∩ B) = 400 + 200 - 50
= 600 - 50
= 550 .....(2)
From (1) and (2) we get
$n(A \cup B) \neq n(A) + n(B) - n(A \cap B)$
∴ The given data is incorrect.

2 Marks

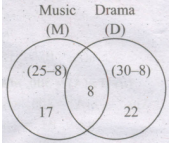
6. n(A) = 25, n(B) = 40, n(AUB) = 50 and n(B′) = 25
n(A∩B) = n(A) + n(B) - n(AUB)
n(A∩B) = 25 + 40 - 50
= 65 - 50
= 15
n(U) = n(B) + n(B)′
= 40 + 25
= 65
∴ n(A∩B) = 15 and n(U) = 65

7. n(A) = 300, n(A∪B) = 500, n(A∩B) = 50 and n(B′) = 350
n(A∪B) = n(A) + n(B) - n(A∩B)
500 = 300 + n(B) - 50
500 = 250 + n(B)
500 - 250 = n(B)
250 = n(B)
∴ n(B) = 250
n(U) = n(B) + n(B)′
= 250 + 350
= 600
∴ n(B) = 250 and n(U) = 600

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8. U = {1, 2, 3, 4, 5, 6, 7, 8, 9, 10}
A = {2, 3, 4, 8, 10}; B = {1, 2, 5, 8, 10}
n(U) = 10, n(A) = 5, n(B) = 5
(A∪B) = {2, 3, 4, 8, 10} ∪ {1, 2, 5, 8, 10}
= {1, 2, 3, 4, 5, 8, 10}
∴ n(A∪B) = 7
(A∩B) = {2, 3, 4, 8, 10} ∩ {1,2,5,8,10}
= { 2, 8, 10}
n(A∩B) = 3 .....(1)
n(A) + n(B) -n(A∩B) = 5 + 5 - 3
= 10 - 3
= 7 .....(2)
From (1) and (2) we get,
n(A∪B) = n(A) + n(B) - n(A∩B)

9. Let M be the set of all students take part in music.
Let D be the set of all students take part in drama.
n(M) = 25, n(D) = 30 and n(M∩D) = 8
By using venn diagram
From the venn diagram we get.
(i) Number of students take part in only music = 17
(ii) Number of students take part in only drama = 22
(iii) Total number of students in the class = 17 + 8 + 22 = 47



Alter :
(i) The number of students who take part in only music

= n(M) - n(M∩D)
= 25 - 8 = 17
(ii) The number of students who take part in only drama
= n(D) - n(M∩D)
= 30 - 8 = 22
(iii) The total number of students
n(M∪D) = n(M) + n(D) - n(M∩D)
= 25 + 30 - 8 = 47

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