Visit QB365-SLMS - https://www.qb365.in/slms/ Complete Questions and Answers

Answers Key:

2 Marks

1. {2, 8, 10}
2. A = {1, 2, 3, 4, 5, 6, 7, 8, 9, 10} B = {0, 1, 2, 3, 4, 5}
   A∪B = {1, 2, 3, 4, 5, 6, 7, 8, 9 10} ∪ {0, 1, 2, 3, 4, 5}
   = {0, 1, 2, 3, 4, 5, 6, 7, 8, 9 ,10}
   A∩B = {1, 2, 3, 4, 5, 6, 7, 8, 9, 10} ∩ {0, 1, 2, 3, 4, 5}
   = {1, 2, 3, 4, 5}
   A-B = {1, 2, 3, 4, 5, 6, 7, 8, 9, 10} - {0, 1, 2, 3, 4, 5}
   = {6, 7, 8, 9, 10}
   B-A = {0, 1, 2, 3, 4, 5} - {1, 2, 3, 4 ,5 ,6, 7, 8, 9 ,10}
   = { 0 }
3. A′∩B′ = {a, c, e, g} ∩ { b, c, f, g}
   = {c, g}
4. B′ = {b, c, f, g}
   (B′)′ = U-B′
   = { a, b, c, d, e, f, g, h} - {b, c, f, g}
   = {a, d, e, h}
5. A′∩B′ = {0, 2, 4, 6} ∩ {1, 4, 6}
   = {4, 6}
6. B′ = {1, 4, 6}
   (B′)′ = {0, 1, 2, 3, 4, 5, 6, 7} - {1, 4, 6}
   = {0, 2, 3, 5, 7}
7. X∪Y = {5, 6, 7} ∪ {5, 7, 9, 10}
   = { 5, 6, 7, 9, 10}
   X∩Y = {5, 6, 7} ∩ {5, 7, 9, 10}
   = {5, 7}
   XΔY = (X∪Y) ∪ (X∩Y)
   = {5, 6, 7, 9, 10} - {5, 7}
   = {6, 9, 10}
   X-Y = {5, 6, 7} - {5, 7, 9, 10}
   = {6}
   Y-X = {5, 7, 9, 10} - {5, 6, 7}
   = {9, 10}
   XΔY = (X-Y)∪ (Y-X)
   = {6} ∪ {9, 10}
   = { 6, 9, 10}
8. (X∪Y)′
9. (i) (P∪Q)∪R
   (P∪Q) = {1, 2, 5, 7, 9} U {2, 3, 5, 9, 11} = {1,2,3,5,7,9,11}
   (P∪Q)∪R = {1,2,3,5,7,9,11} U {3,4,5,7,9} = {1,2,3,4,5,7,9,11}
   (ii) (P∩Q)∩S
   (P∩Q) = {1,2,5,7,9} ∩ {2,3,5,9,11} = {2,5,9}
   (P∩Q)∩S = {2,5,9} ∩ {2,3,4,5,8} = {2,5}
   (iii) (Q∩S)∩R
   (Q∩S) = {2,3,5,9,11} ∩ {2,3,4,5,8} = {2,3,5}
   (Q∩S)∩R = {2,3,5} ∩ {3,4,5,7,9} = {3,5}
10. Commutative Property of union of sets
    (A∪B) = (B∪A)
    Here P = {3,4,5,6}, Q = {√3,√5,√6}
    P∪Q = {3,4,5,6}∪{√3,√5,√6} = {3,4,5,6,√3,√5,√6} ...(1)
    Q∪P = {√3,√5,√6}∪{3,4,5,6} = {√3,√5,√6,3,4,5,6} ...(2)
    (1)=(2)
    ⁂ P∪Q = Q∪P
    ⁂ It is verified that union of sets is commutative.
    Commutative Property of intersection of sets
    (P∩Q) = (Q∩P)
    P∩Q = {3,4,5,6}∩{√3,√5,√6} = { } ...(1)
    Q∩P = {√3,√5,√6}∩{3,4,5,6} = { } ...(2)
    From (1) and (2)

$P \cap Q = Q \cap P$

∴ It is verified that intersection of sets is commutative.

11. Associative Property of union of sets

$A \cup (B \cup C) = (A \cup B) \cup C$

$B \cup C = \{m, n, q, s, t\} \cup \{m, n, p, q, s\} = \{m, n, p, q, s, t\}$

$A \cup (B \cup C) = \{p, q, r, s\} \cup \{m, n, p, q, s, t\} = \{m, n, p, q, r, s, t\}$ ...(1)

$(A \cup B) = \{p, q, r, s\} \cup \{m, n, q, s, t\} = \{p, q, r, s, m, n, t\}$

$(A \cup B) \cup C = \{p, q, r, s, m, n, t\} \cup \{m, n, p, q, s\} = \{p, q, r, s, m, n, t\}$...(2)

From (1) & (2)

It is verified that $A \cup (B \cup C) = (A \cup B) \cup C$

12. Associative Property of intersection of sets

$A \cap (B \cap C) = (A \cap B) \cap C$

$B \cap C = \{\sqrt{3}, \sqrt{5}, 6, 13\} \cap \{\sqrt{2}, \sqrt{3}, \sqrt{5}, 9\} = \{\sqrt{3}, \sqrt{5}\}$

$A \cap (B \cap C) = \{-11, \sqrt{2}, \sqrt{5}, 7\} \cap \{\sqrt{3}, \sqrt{5}\} = \{\sqrt{5}\}$...(1)

$A \cap B = \{-11, \sqrt{2}, \sqrt{5}, 7\} \sqrt{\{\sqrt{3}, \sqrt{5}, 6, 13\}} = \{\sqrt{5}\}$

$(A \cap B) \cap C = \{\sqrt{5}\} \cap \{\sqrt{2}, \sqrt{3}, \sqrt{5}, 9\} = \{\sqrt{5}\}$ ...(2)

From (1) and (2), it is verified that $A \cap (B \cap C) = (A \cap B) \cap C$

13. $A = \{x : x = 2^n, n \in W, n < 4\}$

$x = 2^0 = 1$

$x = 2^1 = 2$

$x = 2^2 = 4$

$x = 2^3 = 8$

∴ $A = \{1, 2, 4, 8\}$

$B = \{x : x = 2n, n \in N \text{ and } n \leq 4\}$

$x = 2 \times 1 = 2$

$x = 2 \times 2 = 4$

$x = 2 \times 3 = 6$

$x = 2 \times 4 = 8$

∴ $B = \{2, 4, 6, 8\}$

$C = \{0, 1, 2, 5, 6\}$

Associative property of intersection of sets

$A \cap (B \cap C) = (A \cap B) \cap C$

$B \cap C = \{2, 6\}$

$A \cap (B \cap C) = \{1, 2, 4, 6, 8\} \cap \{2, 6\}$

$= \{2\}$ .....(1)

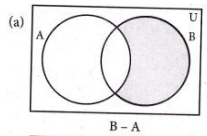
$A \cap B = \{1, 2, 4, 8\} \cap \{2, 4, 6, 8\} = \{2, 4, 8\}$

$(A \cap B) \cap C = \{2, 4, 8\} \cap \{0, 1, 2, 5, 6\}$

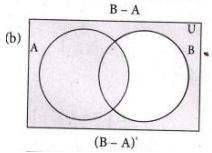
$= \{2\}$ .....(2)

From (1) and (2), It is verified that $A \cap (B \cap C) = (A \cap B) \cap C$

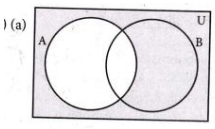
14.



B – A

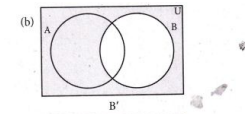


(B – A)'

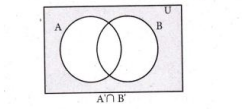


A'

15.



B'



A' ∩ B'

QB 365 TM Study Material
QUESTION BANK 365