4. Represent the following by non-diagram :

   (a) $A - (B \cup C)$

   (b) $(A \cap B) \cup C$

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

5. Prove that :

   (a) $(A \cap B)' = A' \cap B'$

   (b) $A' \cap B' = (A \cap B)'$

6. Explain about the following :

   (a) Conjunction and Disjunction

   (b) Equivalence relation

7. Given the following adjacency matrix, draw the weighted graph :

	A	B	C	D	E
A	0	4	0	2	0
B	0	0	0	7	0
C	0	5	0	0	0
D	0	0	0	0	3
E	0	0	1	0	0

2015

Time : 3 hours

Full Marks : 80

Candidates are required to give their answers in their own words as far as practicable.

The figures in the margin indicate full marks.

Answer from both the Groups as directed.

Group – A

(Objective-type Questions)

(Compulsory)

Answer **all** questions.

1. Choose the correct answer of the following : $2 \times 5 = 10$

   (a) An edge that has identical end-points is called a _____ :

   (i) Multi-Path

   (ii) Loop

(iii) Cycle

(iv) Multi-edge

(b) The memory use of an adjacency matrix is _____.

(i) O(n)

(ii) $O(n^2)$

(iii) $O(n^3)$

(iv) O(logn)

(c) A graph in which there exists a path between any two of its nodes is called a _____.

(i) Complete graph

(ii) Connected graph

(iii) Digraph

(iv) In-directed graph

(d) What is the output of EX-OK gate when input is 0 ?

(i) 0

(ii) 1

(iii) Both (i) and (ii)

(iv) None of these

(e) $A \cup (B \cap C) =$ _____.

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

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

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

(iv) None of these

2. Fill in the blanks : 2×5 = 10

(a) Adjacency matrix is also known as _____.

(b) A graph with multiple edges and /or a loop is called a _____.

(c) An edge is called a _____ if removing that edge result in a disconnected graph.

(d) Suppose A is finite set and n(A) = m, then _____.

(e) In regular graph, every node have _____.

Group – B

(Long-answer Type Questions)

Answer any **four** questions : 15×4 = 60

3. Consider the following graph and give the degree of each node :