

Day: Wednesday

Date: 24/04/2019

S-2019-2167

Time: 10.00 AM TO 01.00 PM

Max. Marks: 100

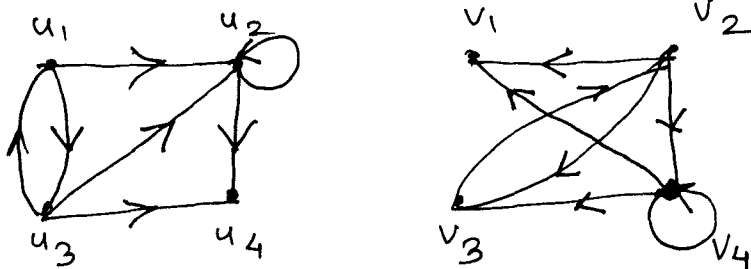
N.B.:

- 1) Attempt any **FOUR** questions from Section –I and any **TWO** questions from Section –II.
- 2) Figures to the right indicate **FULL** marks.
- 3) Answers to both the sections should be written in *SAME* answer book.
- 4) Use of **non-programmable scientific** calculator is allowed.

SECTION-I

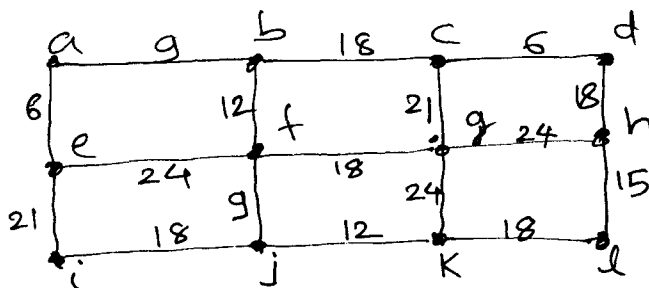
- Q.1** Explain following problems: (15)
- i) Konigsberg Bridges problem
 - ii) Seating arrangement problem
 - iii) Travelling salesman problem

- Q.2** State whether the following graphs are isomorphic with justification. (15)



- Q.3** Solve the recurrence relation: (15)
- $$a_n = 6a_{n-1} - 11a_{n-2} + 6a_{n-3}$$

- Q.4** Use Kruskal's algorithm to find minimum spanning tree in the following (15) weighted graph.



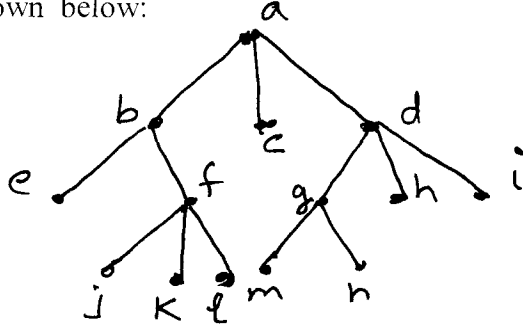
- Q.5** How many ways are there for eight men and five women to stand in a line so that (15)
- a) no two women stand next to each other?
 - b) four men are always together?
 - c) all women are always together?

P. T. O.

- Q.6** Write short notes on any **THREE** of the following: (15)
- Floyde's Algorithm
 - Heap sorting algorithm
 - Generalized permutations
 - Master theorem regarding recurrence relations

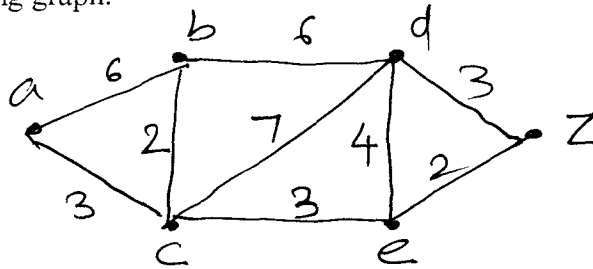
SECTION-II

- Q.7 a)** In which order does an in order traversal visit the vertices of the ordered rooted tree T as shown below: (10)



- b)** Find the coefficient of the terms : (10)
- x^7y^9
 - x^5y^{11}
- in the expansion of $(2x - 3y)^{16}$ by using Binomial expansion theorem.

- Q.8** Explain Dijkstra's algorithm. Use it to find shortest path between a and z in the following graph. (20)



- Q.9 a)** Explain Huffman's algorithm with suitable example. (10)
- b)** Solve the following travelling salesman problem. (10)

