



THE AMERICAN COLLEGE, MADURAI

(An Autonomous Institution Affiliated to Madurai Kamaraj University)
 Re-accredited (2nd Cycle) by NAAC with Grade "A", CGPA – 3.46 on a 4-point scale

Backlog Arrear Examination, March 2021

MAS 2465/2558

Graph Theory and OR

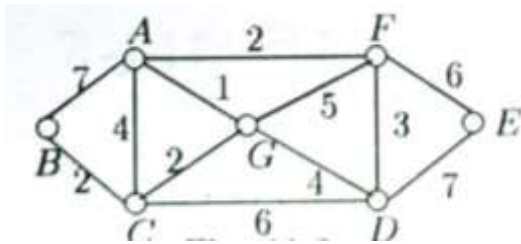
MAX: 75 marks

TIME: 3 hours

Answer Any FIVE of the following questions

5 × 15 = 75

- Find the shortest distance from vertex A to all vertices in the following weighted graph using Dijkstra's algorithm



- Find the closure of the following graph



- Solve the following transportation problem

$$\begin{array}{cccc|c} 21 & 16 & 25 & 13 & 11 \\ 17 & 18 & 14 & 23 & 13 \\ 32 & 27 & 18 & 41 & 19 \\ \hline 6 & 10 & 12 & 15 & \end{array}$$

- Solve the following assignment problem for maximization profit

$$\begin{array}{c} 1 \quad 2 \quad 3 \quad 4 \\ \begin{array}{l} A \\ B \\ C \\ D \end{array} \begin{pmatrix} 140 & 112 & 98 & 154 \\ 90 & 72 & 63 & 99 \\ 110 & 88 & 77 & 121 \\ 80 & 64 & 56 & 88 \end{pmatrix} \end{array}$$

- Solve the following travelling salesman problem.

	A	B	C	D	E
A	-	4	7	3	4
B	4	-	6	3	4
C	7	6	-	7	5
D	3	3	7	-	7
E	4	4	5	7	-

6. Use the notation of dominance to simplify the rectangular game with the following payoff find its graphical solution.

$$\begin{pmatrix} 18 & 4 & 6 & 4 \\ 6 & 2 & 13 & 7 \\ 11 & 5 & 17 & 3 \\ 7 & 6 & 12 & 2 \end{pmatrix}$$

7. Compute the earliest start, earliest finish, latest start and latest finish of each activity of the project given below

Activity :	0 - 1	1 - 2	1 - 3	2 - 4	2 - 5	3 - 4	3 - 6	4 - 7	5 - 7	6 - 7
Duration :	2	8	10	6	3	3	7	5	2	8