

**M.COM DEGREE END SEMESTER EXAMINATION APRIL -  
2016**

**SEMESTER -2: COMMERCE**

COURSE – P2COMT10: OPERATIONS RESEARCH

*(Common for Regular- 2015 Admission /Supplementary- 2014 Admission)*

Time: Three Hours

Maximum:75Marks

**SECTION A**

Answer **all** questions. Each question carries 2 marks

1. What is PERT ?
2. What is dual problem?
3. What are dummy activities?
4. What is unbalanced transportation?
5. What are constraints?
6. What is “minimax”?
7. What do you mean by ‘two persons zero sum game’?
8. What is decision tree?
9. What is “critical path”?
10. What is “free float”

(2 x 10 = 20)

**SECTION B**

Answer **any five** questions each question carries 5 marks

11. Explain the procedure of determining the critical path in a project.
12. What are the differences between PERT and CPM?
13. Explain North West Corner Rule in constructing initial basic feasible solution?
14. Solve graphically the following LPP:  
Maximize  $Z=1000x_1 + 850x_2$   
Subject to  
 $x_1+x_2 \leq 11$   
 $6x_1+9x_2 \leq 60$   
 $600x_1+500x_2 \leq 6000$   
 $x_1 \geq 0, x_2 \geq 0$
15. Determine the optimum strategies for both the players and find the value of game from the following pay-off matrix for player A

Player B

6	-3	7
Player A		
-3	0	4

16. There are three booking clerks at a railway ticket counter. Passengers arrive at an average rate of 200 per 8 hour day. The mean service time is 4 minutes and are served strictly on first-cum-first-serve base. Find the idle time of a booking clerk.
17. Determine an initial basic feasible solution to the following transportation problem using North West Corner Rule:

	D1	D2	D3	D4	Supply
01	6	4	1	5	14
02	8	9	2	7	16
03	4	3	6	2	5
Required	6	10	15	4	35

18. Using the following cost matrix, determine (a) Optimal job assignment and (b) Cost of assignment

		Job				
		1	2	3	4	5
Machine	A	10	3	3	2	8
	B	9	7	8	2	7
	C	7	5	6	2	4
	D	3	5	8	2	4
	E	9	10	9	6	10

(5 x 5 = 25)

### SECTION C

Answer **any two** questions in this section each question carries **15** marks

19. Define operations research. Explain the methodology of operations research in solving problems.
20. Solve the following problem using Simplex method Maximise  $Z = 2x_1 + 4x_2$  Subject to :
- $$2x_1 + x_2 \leq 18$$

$$3X_1 + 2X_2 > 30$$

$$X_1 + 2X_2 = 26$$

$$X_1, X_2 > 0$$

21. Solve the following transportation problem

Destination	Origins				Required
	A	B	C	D	
1	7	4	3	4	15
2	3	2	7	5	25
3	4	4	3	7	20
4	9	7	5	9	40
Available	12	8	35	25	

22. Following details are available in respect of a project :

Activity	Optimistic time (days)	Most expected time(days)	Pessimistic time(days)
1-2	4	8	12
2-3	1	4	7
2-4	8	12	
3-5	3	5	7
4-6	0	0	0
4-6	3	6	9
5-7	3	6	9
5-8	4	6	
7-9	4	8	12
8-9	2	5	
9-10	4	10	16
6-10	4	6	8

You are required to

1. Draw network diagram
2. Find the critical path.
3. Earliest and latest expected time
4. What is the probability that the project will be completed within 48 days.

(15 x 2 = 30)