MCOHC-3.2

Sl. No.

III Semester M.Com. Degree Examination, October/November - 2025

COMMERCE

Quantitative Techniques

(CBCS, SLM Semester Scheme)

Time : 3 Hours **Maximum Marks : 80**

SECTION - A

Answer any Four questions. Each question carries 5 marks. **(4×5=20)**

1. What are the essential characteristics of linear programming?
2. State the differences between transportation problem and assignment problem.
3. Write a note on Game without saddle point.
4. Explain the various types of decision making situations.
5. Write a note on theoretical distribution.
6. Construct Network diagram using the following scheme.

Activity	1 - 2	1 - 3	2 - 4	3 - 4	3 - 5	4 - 5
Time	4	1	3	6	5	8

SECTION - B

Answer any Three questions. Each question carries 10 marks. **(3×10=30)**

7. A manufacturer produces two different models X and Y of the same product. Model X makes a contribution of Rs. 50 per unit and Model Y Rs. 30 per unit towards total profit Raw material r_1 and r_2 must be used daily. At least 18kgs of r_1 and 12kgs of r_2 must be used daily. Also at most 34 hours of labour are to be utilized. A quantity of 2kg of r1 is needed for model X and 1kg of r_1 for model Y. For each of X and Y, 1kg of r_2 is required. It takes 3 hours to manufacture model X and 2 hours to manufacture Model Y. How many units of each model should be produced in order to maximize the profit? Solve through graphical representation to obtain optinal solution.
8. Give the following data for an item of uniform demand, instantaneous delivery time and back order facility. Annual demand 800 units, Cost of an item Rs. 40, Ordering cost Rs. 800, inventory carrying cost: 40%, back order cost Rs. 10.
   i) Minimum cost order quantity.
   ii) Maximum number of back orders.
   iii) Minimum inventory levels.
   iv) Time between orders.
   v) Total annual cost.

[P.T.O.

9. Solve the following transportation.

Source	**D_1**	**D_2**	**D_3**	**D_4**	**D_5**	**Available**
S_1	4	7	3	8	2	4
S_2	1	4	7	3	8	7
S_3	7	2	4	7	7	9
S_4	4	7	2	4	7	2
Requirements	8	3	7	2	2	--

10. What is Linear Programming? Explain the procedure for determining optimum solution under duality problem.

11. What is critical path? Explain the procedure for determining critical path under CPM.

SECTION - C

Answer any Two questions. Each question carries 15 marks. (2×15=30)

12. The following table shows the jobs of a network along with their time estimates. The time estimates are in days:

Job	**1 - 2**	**1 - 6**	**2 - 3**	**2 - 4**	**3 - 5**	**4 - 5**	**5 - 8**	**6 - 7**	**7 - 8**
a	3	2	6	2	5	3	1	3	4
m	6	5	12	5	11	6	4	9	19
b	15	14	30	8	17	15	7	27	28

i) Draw the project network.

ii) Find the critical path.

iii) Find the probability that the project is completed in 31 days.

13. A company has six jobs A to F. All the jobs have to go through two machines M_1 and M_2. The time required for the jobs on each machine in hours is given below. Find the optimum sequence that minimizes the total elapsed time.

Job	**A**	**B**	**C**	**D**	**E**	**F**
Machine 1	1	4	6	3	5	2
Machine 2	3	6	8	8	1	5

14. Explain Mante Carlo techniques of simulation.

15. Explain Hungarian Method of Solving assignment problem.
