

14. What is Free Float ?
15. Write a note on EOL
16. What is basic feasible solution in transportation problem ?
17. What is zero sum game ?
18. Explain decision node decision tree.
19. Explain optimal solution in LPP.
20. Explain Decision trees.

(8 × 2 = 16 marks)

Part III

*Answer any six questions.
Each question carries 4 marks.*

21. Discuss the advantages of Operation Research.
22. State Application of Linear Programming problem.
23. Discuss the difference between PERT and CPM.
24. Explain the methods of finding the initial feasible solution in transportation problem.
25. Write a short note on Decision theory.
26. Construct network diagram and determine critical path and project duration :

Job	Predecessor	Job	Predecessor	Job	Predecessor
A	–	F	A	L	G, H
B	–	G	F	M	J, K, L
C	A	H	D, E	N	J, K, L
D	A	J	G, H	O	K, J
E	B, C	K	G, H		

27. A factory manufactures two products A and B. To manufacture one unit of A, 1.5 machine hours and 2.5 labour hours are required. To manufacture product B, 2.5 machine hours and 1.5 labour hours are required. In a month, 300 machine hours and 240 labour hours are available. Profit per unit for A is Rs. 50 and for B is Rs. 40. Formulate as LPP.

Turn over

28. A decision maker faced with three decision alternatives and four states of nature constructs the following pay off table :

States of Nature	Acts			
	A ₁	A ₂	A ₃	A ₄
S ₁	5	10	18	25
S ₂	8	7	8	23
S ₃	21	18	12	21
S ₄	30	22	19	20

Determine the alternative to be chosen under :

- (i) Maximax Criterion ;
- (ii) Maximin Criterion ; and
- (iii) Minimax Regret Criterion.

(6 × 4 = 24 marks)

Part IV (Long Essays)

Answer any **two** questions.

Each question carries 15 marks.

29. Solve the Linear Programming Problem graphically :

$$\text{Minimize } Z = 40X_1 + 80X_2$$

$$\text{subject to constraints : } 72X_1 + 12X_2 \geq 216$$

$$6X_1 + 24X_2 \geq 72$$

$$40X_1 + 20X_2 \geq 200$$

$$X_1, X_2 \geq 0.$$

30. The time estimates of a project are given (in days) below :

- (a) Draw the project network
- (b) Identify all paths through it and write critical path.
- (c) Determine the expected project length and standard deviation.
- (d) What is the probability that project will be completed in 35 days ?

Activity	<i>to</i>	<i>tm</i>	<i>tp</i>
1-2	6	12	30
1-3	3	6	15
1-4	3	9	27
2-6	4	19	28
3-5	3	9	27
3-6	2	5	8
4-5	1	4	7
5-6	6	12	30

31. Find the initial basic feasible solution to the given transportation problem using the North-west corner rule :

From					SUPPLY
	D1	D2	D3	D4	
O1	11	13	17	14	250
O2	16	18	14	10	300
O3	21	24	13	10	400
DEMAND	200	225	275	250	

(2 × 15 = 30 marks)