

C 40450

(Pages : 4)

Name.....

Reg. No.....

SIXTH SEMESTER U.G. DEGREE EXAMINATION, MARCH 2023

(CBCSS—UG)

B.B.A.

BBA 6B 13—MANAGEMENT SCIENCE

(2019 Admission onwards)

Time : Two Hours and a Half

Maximum : 80 Marks

Part A*Answer all questions.*

1. Define OR.
2. Explain the properties of linear programming problem.
3. Explain the term activity in network analysis.
4. What is Decision Tree ?
5. Explain various types of floats.
6. What is linear programming problems ?
7. What is feasible solution ?
8. Explain optimism criterion.
9. Explain saddle point.
10. What are the elements of decision making ?
11. Name any *two* methods finding initial feasible solution in transportation problem.
12. What is game theory ?
13. What is payoff matrix ?
14. Explain head event slack.
15. What is critical path ?

(15 × 2 = 30 Maximum ceiling 25 marks)

Turn over

Part B*Answer all questions.*

16. Discuss the limitations of CPM.
17. What are the limitations of LPP ?
18. Discuss some methods which are useful for decision making under uncertainty.
19. Write a short note on :
- Optimistic time ;
 - Pessimistic ; and
 - Most likely time.
20. The characteristics of a project schedule are given below :

S. No.	Activity	Time	S. No.	Activity	Time
1.	1-2	6	2.	1-3	4
3.	2-4	1	4.	3-4	2
5.	3-5	5	6.	4-7	7
7.	5-6	8	8.	6-8	4
9.	8-7	2	10.	7-9	2
11.	8-9	1			

Construct a suitable network.

21. Solve the LPP problem graphically :

$$\begin{aligned} &\text{Maximize } Z = 8x_1 + 5x_2 \\ &\text{subject to } 2x_1 + 2x_2 \leq 500 \\ &\quad x_1 \geq \\ &\quad x_2 \geq 250 \\ &\quad x_1, x_2 \geq 0. \end{aligned}$$

22. A company is planning for its sales targets and the strategies to achieve these targets. The data in terms of three sales targets, their respective utilities, various strategies and appropriate probability distribution are given in the table given below. What is the optimal strategy ?

<i>Sales targets (× lakhs)</i>	50	75	100
Utility	4	7	9
	Prob	Prob.	Prob.
Strategies			
S ₁	0.6	0.3	0.1
S ₂	0.2	0.5	0.3
S ₃	0.5	0.3	0.2

23. Determine an initial basic feasible solution to the following transportation problem by using the North-West corner rule.

Destination

	D ₁	D ₂	D ₃	D ₄	Supply
S ₁	21	16	15	3	11
S ₂	17	18	14	23	13
S ₃	32	27	18	41	19
Demand	6	6	8	23	

(8 × 5 = 40 Maximum ceiling 35 marks)

Part C

Answer any two questions.

Each question carries 10 marks.

24. A company manufactures two products A and B. These products are processed in the same machine. It takes 10 minutes to process one unit of product A and 2 minutes for each unit of product B and the machine operates for a maximum of 35 hours in a week. Product A requires 1 kg and B 0.5 kg of raw material per unit, the supply of which is 600 kg per week. The market constraint on product B is known to be 800 units every week. Product A costs 5 per unit and is sold at 10. Product B costs 6 per unit and can be sold in the market at a unit price of 8. Develop mathematical model using LPP.

Turn over

25. A small maintenance project consists of the following Jobs whose precedence relationships are gives below :

Job	:	1-2	1-3	2-3	2-5	3-4	3-6	4-5	4-6	5-6	6-7
Duration	:	15	15	3	5	8	12	1	14	3	14

- 1 Draw an arrow diagram.
 - 2 Find the total float for each activity.
 - 3 Find the critical path and the project duration.
26. A retailer purchases Apple every morning at Rs 50 a case and sells them for Rs 80 a case. Any case that remains unsold at the end of the day can be disposed of the next day at a salvage value of Rs 20 per case. (Thereafter they have no value). Past sales have ranged from 15 to 18 cases per day. The following is the record of the sales for the past 120 days :

Cases sold	:	15	16	17	18
Number of days	:	12	24	48	36

Find out how many cases should the retailer purchase per day in order to maximize his profit ?

27. Discuss the important Operations Research techniques.

(2 × 10 = 20 marks)