

23U668

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Name:

Reg.No:

SIXTH SEMESTER B.B.A. DEGREE EXAMINATION, APRIL 2026

(CBCSS - UG)

(Regular/Supplementary/Improvement)

CC19UBBA6B13 - MANAGEMENT SCIENCE

(BBA - Core Course)

(2019 Admission onwards)

Time : 2.5 Hours

Maximum : 80 Marks

Credit : 4

Part A (Short answer questions)

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

1. What are the characteristics of OR?
2. List down the applications of OR.
3. Give any point explaining the relation between OR and Modern Business management.
4. Mention any 2 advantages of LP.
5. An animal feed company must produce atleast 400 kgs of a mixture consisting of ingredients X_1 , X_2 and X_3 daily. X_1 costs Rs. 3 per Kg, X_2 Rs. 8 per Kg, X_3 10 per kg. No more than 80 kgs of X_1 can be used and atleast 60 Kgs of X_2 must be used. Also a minimum of 80 kgs of X_3 must be used. Formulate a mathematical model to the problem.
6. State the meaning of a dummy activity.
7. Explain the concept of free float.
8. State the concept of optimistic time estimate.
9. What do you mean by decision theory?
10. What do you mean by decision making under risk?
11. What is Expected Value of Perfect Information (EVPI)?
12. What is zero sum game?
13. List out the basic assumptions in transportation technique.
14. Explain non-degenerate basic feasible solution under transportation problem.
15. What is Vogel's Approximation Method?

(Ceiling: 25 Marks)

Part B (Paragraph questions)

Answer **all** questions. Each question carries 5 marks.

16. What are the advantages and disadvantages of L.P.P ?

17. What are the managerial applications of network techniques?

18. Draw the network diagram to the following activities.

Activity (i, j)	Time duration
1-2	4
1-3	6
1-4	4
2-5	5
3-5	9
4-6	5
5-6	7

19. Discuss decision making under uncertainty.

20. A food products company is planning the introduction of a revolutionary new product with new packing to replace the existing product at much higher price (S_1) or a moderate change in the composition of the existing product with a new packaging at a small increase in price (S_2) or a small change in the composition of the existing except the word, New with a negligible increase in the price (S_3). The three possible states of nature of events are

(i) high increase in sales (N_1)

(ii) no change in sales (N_2)

(iii) decrease in sales (N_1).

The marketing department of the company worked out the pay offs in terms of yearly new profits for each of the strategies on these events. This is represented in the following table.

Pay offs			
Strategies	States of Nature		
	N_1	N_2	N_3
S_1	700	300	150
S_2	500	450	0
S_3	300	300	300

Which strategy should the executive concerned choose on the basis of

(a) Maximin Criterion

(b) Maximax Criterion

21. The research department of consumer products division has recommended to the marketing department to launch a soap with three different perfumes. The marketing manager has to decide the type of perfume to launch under the following estimated pay off for the various levels of sales.

Types of perfume	Estimated levels of sales (units)		
	20000	10000	2000
I	250	15	10
II	40	20	5
III	60	25	3

Estimate which type can be chosen under laplace and Hurwicz Alpha criteria. (Given $\alpha = .6$)

22. Determine initial basic feasible solution of the transportation problem by lowest cost entry method.

Origin	Destinations				Supply
	A	B	C	D	
1	1	5	3	3	34
2	3	3	1	2	15
3	0	2	2	3	12
4	2	7	2	4	19
Demand	21	25	17	17	

23. A steel company has three open hearth furnaces and five rolling mills. Transportation cost (rupees per quintal) for shipping steel from furnaces to rolling mills are shown in the following table.

	Rolling Mills				Capacities
	M ₁	M ₂	M ₃	M ₄	
F ₁	6	1	9	3	70
F ₂	11	5	2	8	55
F ₃	10	12	4	7	70
Requirement	85	35	50	45	

(Ceiling: 35 Marks)

Part C (Essay questions)

Answer any **two** questions. Each question carries 10 marks.

24. A steel plant produces scrap in mixed lots of three goods 1, 2 and 3. The plant requires at least 90 tons of grade 1 scrap, 85 tons of grade 2 scrap and 75 tons of grade 3 scrap. It can produce any quantity from two sources A and B. Experience shows that the sources give the following properties of graded scraps.

Source	Grade I	Grade II	Grade III
A	30%	40%	30%
B	40%	30%	30%

If the costs of sources A is Rs 500 per ton and source B is Rs. 400 per ton, how many tons of two should be mixed for fulfilling its scrap requirements at minimum cost? Formulate LPP and solve graphically.

25. What are Models? Explain the different types of Models used in OR.
26. A firm owner is seriously considering of drilling a farm well a past, only 70% of wells drilled were successful at 200 feet of depth int area. Moreover on finding no water at 200 ft., some persons d further up to 250 feet but only 20% struck water at 250 ft. The preva cost of drilling is Rs. 50 per foot. The owner has estimated that case he does not get his own wells he will have to pay Rs. 15,000 over next 10 years, in PV term, to buy water from the neighbour. The follow decisions can be optimal.
- water is drilled
- (i) Do not drill any well
- (ii) drill up to 200ft
- (iii) if no water is drilled at 200 ft , drill further up to 250 ft.

Draw an appropriate decision tree and determine the farm owner 's strategy under E. M. V. approach

27. The following is the unit cost matrix of a transportation problem Use Modi method to obtain the optimum basic feasible solution.

	D ₁	D ₂	D ₃	Available
S ₁	50	30	220	1
S ₂	90	45	170	3
S ₃	250	200	50	4
Requirement	4	2	2	

(2 × 10 = 20 Marks)
