

FOURTH SEMESTER B.B.A. DEGREE EXAMINATION, APRIL 2017

(CUCBCSS-UG)

Complementary Course

BBA IVC 04—MANAGEMENT SCIENCE

Time : Three Hours

Maximum : 80 Marks

Part I*Answer all ten questions.*

1. Operations research approach is :
 - (a) Multi disciplinary.
 - (b) Scientific.
 - (c) Intuitive.
 - (d) All of the above.
2. A model is :
 - (a) A representation of reality.
 - (b) An approximation.
 - (c) An idealization'.
 - (d) All of the above.
3. Linear programming is a :
 - (a) Constrained optimization technique.
 - (b) Technique for economic allocation of limited resources.
 - (c) Mathematical technique.
 - (d) All of the above.
4. A feasible solution to a linear programming problem :
 - (a) Must satisfy all problem constraints simultaneously.
 - (b) Need not satisfy all constraints.
 - (c) Must be a corner point of the feasible region.
 - (d) Must optimize the value of the objective function..
5. Decision theory is concerned with :
 - (a) Methods of arriving at an optimal decision.
 - (b) Selecting optimal decision in sequential manner.
 - (c) Analysis of information that is available.
 - (d) All of the above.

Turn over

6. PERT gives emphasis on :
- (a) Time. (b) Activity.
(c) Time and Activity. (d) None of the above.
7. When total supply is equal to total demand in a transportation problem, the problem is said to be ?
- (a) Balanced. (b) Unbalanced.
(c) Degenerate. (d) None of the above.
8. Game theory models are classified by the :
- (a) Number of players. (b) Sum of all pay off.
(c) Number of strategies. (d) All of the above.
9. The minimum expected opportunity loss is :
- (a) Equal to EVPI. (b) Minimum regret.
(c) Equal to EMV. (d) Both (a) and (b).
10. An assignment problem can be solved by
- (a) Simplex method.
(b) Transportation method.
(c) Both simplex & transportation method.
(d) None of the above.

(10 × 1 = 10 marks)

Part II (Short Answer Questions)

Answer any eight questions.

11. Define Operations Research.
12. What do you mean by a model ?
13. State the objectives of Operations Research.
14. Define linear programming.
15. Define constraints.
16. What is PERT ?
17. What do you mean by a strategy ?
18. What do you mean by a dummy activity ?
19. Define a basic feasible solution to LPP.
20. What do you mean by expected monetary value ?

(8 × 2 = 16 marks)

Part III (Short Essays)*Answer any six questions.*

21. Discuss scientific methodology used in operations research.
22. Explain the different types of models used in operations research.
23. What do you mean by decision making under risk? What are the methods used for decision making under this situation?
24. Distinguish between PERT and CPM.
25. A person wants to decide the constituents of a diet which will fulfill his daily requirements of proteins, fats and carbohydrates at the minimum cost. The choice is to be made from four different types of foods. The yields per unit of these foods are given in the following table Formulate linear programming model for the problem :

Food type	Yield per unit			Cost per unit (Rs.)
	Proteins	Fats	Carbohydrates	
1	3	2	6	45
2	4	2	4	40
3	8	7	7	85
4	6	5	4	65
Minimum requirement	800	200	700	

26. From the following pay off matrix determine the best course of action on the basis of Expected monetary value :

States of nature	Action A	Action B	Action C
S ₁	250	-100	-800
S ₂	400	480	520
S ₃	620	800	860

Probabilities associated with the states of natures S₁, S₂ and S₃ are 0.1, 0.7 and 0.2 respectively.

27. From the following pay off matrix of two competing firms Alpha and Beta. determine the optimal strategy for both the firms and value of the game under maximin and minmax principle :

		Firm Alpha				
		4	-1	2	6	7
Firm Beta	-1	8	1	4	12	
	12	5	3	14	10	
	1	10	2	2	-1	

Turn over

28. From the following opportunity loss table determine best decision strategy :

States of Nature	Action I	Action II	Action III
X	4	-2	6
Y	2	4	5
Z	2	4	-4

States of natures S1, S2 and S3 assume probabilities 0.3, 0.3 and 0.4 respectively.

(6 × 4 = 24 marks)

Part IV (Long Essay)

Answer any two questions.

29. A pharmaceutical company manufactures two types of drugs, X and Y. Each unit of drug Y takes twice as long to produce as one unit of X and the company would have time to make a maximum of 2000 units per day if it produced drug X only. The supply of raw material is sufficient to produce both X and Y is only 1500 units. Drug Y requires a chemical compound which is available for the production of 600 units per day. If the company makes a profit of rupees 3 and 5 per unit respectively on X and Y, how many of each drug should be produced to maximize profit, using graphical method of LPP.
30. A company has four terminals U, V, W and X. at the start of a particular day 10, 4, 6, and 5 trailers respectively are available at these terminals. During the previous night 13, 10, 6 and 6 trailers respectively were loaded at plants A, B, C and D. The company dispatcher has come up with the costs between the terminals and plants as follows :

		Plants			
		A	B	C	D
Terminals	U	20	36	10	28
	V	40	20	45	20
	W	75	35	45	50
	X	30	35	40	25

Find the allocation of loaded trailers from plants to terminals in order to minimize transportation cost.

31. Construct a network diagram and find critical path in respect of a project which has the following characteristics :

Activity	1-2	2-3	3-4	3-5	4-6	5-6	5-7	6-8	7-8	8-9	9-10
Duration	13	8	10	11	9	10	6	8	7	14	18

(2 × 15 = 30 marks)