

FOURTH SEMESTER B.B.A. DEGREE EXAMINATION, APRIL 2019

(CUCBCSS—UG)

B.B.A.

BBA IV C 04—MANAGEMENT SCIENCE

Time : Three Hours

Maximum : 80 Marks

Part I

*Answer all ten questions.
Each question carries 1 mark.*

1. Decision variables are :
(a) Controllable. (b) Uncontrollable.
(c) Parameters. (d) None of the above.
2. The application of OR techniques involves _____ approach.
(a) Individual. (b) Team.
(c) Critical. (d) None of the above.
3. _____ is a method of analyzing the current movement of the same variable in an effort to predict the future movement of the same variable.
(a) Goal programming. (b) Markov analysis.
(c) Replacement theory. (d) Queuing theory.
4. A constraint in an LP model restricts :
(a) Value of objective function. (b) Value of decision variable.
(c) Use of available resource. (d) All of the above.
5. A linear programming model does not contain which of the following components ?
(a) Data. (b) Decisions.
(c) Constraints. (d) A spread sheet.
6. _____ is a series of related activities which result in some product or services.
(a) Network. (b) Transportation model.
(c) Assignment. (d) None of these.

Turn over

7. PERT emphasis on _____.
- (a) Time. (b) Activity.
(c) (a) and (b). (d) None of the above.
8. For decision-making under uncertainty, identify the decision rule that is appropriate for the optimist :
- (a) Laplace. (b) Maximax.
(c) Minimax regret. (d) Maxmin.
9. The minimum expected opportunity loss is :
- (a) Equal to EVPI. (b) Minimum regret.
(c) Equal to EMV. (d) Both (a) and (b).
10. Game theory models are classified by the :
- (a) Number of players. (b) Sum of all payoff.
(c) Number of strategies. (d) All of the above.

(10 × 1 = 10 marks)

Part II (Short Answer Questions)

Answer any eight questions.

Each question carries 2 marks.

11. What are the characteristics of Operations research technique ?
12. Distinguish between iconic model and analogue model.
13. What are the main properties of linear programming problems ?
14. Define a dummy activity.
15. Define critical path method.
16. Define Programme Evaluation and Review Technique.
17. What are the limitations of PERT /CPM ?
18. Define pay-off.
19. Define Expected Monetary Value (EMV).
20. What is meant by a decision tree ?

(8 × 2 = 16 marks)

Part III (Short Essays)

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

21. Define Operations Research and discuss its scope and limitations.
22. A paint manufacturer produces two types of paint, one type of standard quality (S) and the other of top quality (T). To make these paints, he needs two ingredients, the pigment and the resin. Standard quality paint requires 2 units of pigment and 3 units of resin for each unit made, and is sold at a profit of R1 per unit. Top quality paint requires 4 units of pigment and 2 units of resin for each unit made, and is sold at a profit of R1.50 per unit. He has stocks of 12 units of pigment, and 10 units of resin. Formulate the above problem as a linear programming problem to maximize his profit?
23. Construct the network diagram for a project with the following activities :

<i>Activity</i>	<i>Description</i>	<i>Predecessor activity</i>
A	Finish Component Development	
B	Design marketing programme	A
C	Design production system	A
D	Select Advertising media	B
E	Initial production run	C
F	Release component to market	D, E

24. Solve the game with the following pay-off matrix :

	Player B					
	Strategies					
	I	II	III	IV	V	
Player A Strategies	1	2	3	8	7	0
	2	1	7	5	2	3
	3	4	2	3	5	1
	4	6	4	5	4	7

25. By using the North West Corner Method determine the basic feasible solution :

Factories	Retail Agency					Capacity
	1	2	3	4	5	
1	1	9	13	36	51	50
2	24	12	16	20	1	100
3	14	33	1	23	26	150
Requirement	100	60	50	50	40	300

Turn over

26. What is decision-making under risk and explain different methods to solve it ?
27. Describe MODI method to solve the Transportation problem.
28. What are the different techniques involved in Operations Research ?

(6 × 4 = 24 marks)

Part IV (Long Essays)*Answer any two questions.**Each question carries 15 marks.*

29. Solve graphically the following LPP

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

subject to :

$$2X_1 + 3X_2 \leq 48$$

$$X_1 \leq 15$$

$$X_2 \leq 10$$

$$X_1 \geq 0, X_2 \geq 0.$$

30. Find the optimum solution of the following TP :

	Supply					
	1	9	13	36	51	50
	24	12	16	20	1	100
	14	33	1	23	26	150
Demand	100	70	50	40	40	300

31. For the past 200 days, the sales of cakes (1 kg) from the Lovely Bakery has been as follows :

Daily sales : 0 100 200 300 400

No. of days : 10 60 60 50 20

- (a) Calculate the expected sale of cakes.
- (b) Production cost per cake (1 kg) are Rs. 5 and sale price is Rs. 10 per cake, and any cake unsold at the end of the day is contracted to a local farmer, who pays Rs. 2 per cake. Draw up a pay-off table for each sales/production combination.
- (c) Compute the expected profit arising from each level of production and determine the optimal policy.

(2 × 15 = 30 marks)