

C 2108

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Name.....

Reg. No.....

**FOURTH SEMESTER (CUCBCSS—UG) DEGREE EXAMINATION
APRIL 2021**

B.B.A.

BBA IVC 04—MANAGEMENT SCIENCE

Time : Three Hours

Maximum : 80 Marks

Part I

Answer all questions.

Each question carries 1 mark.

1. Operations research is the application of _____ methods to arrive at the optimal Solutions to the problems.
 - (a) Economical.
 - (b) Scientific.
 - (c) (a) and (b) both.
 - (d) Artistic.
2. The Operations research technique which helps in minimizing total waiting and service costs is :
 - (a) Queuing Theory.
 - (b) Decision Theory.
 - (c) Both (a) and (b).
 - (d) None of the above.
3. In LPP, graphical method the restriction on number of constraint is _____.
 - (a) 2.
 - (b) Not more than 3.
 - (c) 3.
 - (d) None of the above.
4. VAM stands for _____.
 - (a) Voegal's Approximation Method.
 - (b) Vogel's Approximate Method.
 - (c) Vangel's Approximation Method.
 - (d) Vogel's Approximation Method.
5. According to transportation problem number of basic cells will be exactly :
 - (a) $m + n - 0$.
 - (b) $n + m - 1$.
 - (c) $m + n - 1$.
 - (d) None of the above.

Turn over

6. Activities falling on the critical path have.
- (a) Zero slack. (b) Maximum slack.
(c) Negative slack. (d) Minimum slack.
7. For solving an assignment problem, which method is used ?
- (a) Hungarian. (b) American.
(c) German. (d) Both are incorrect.
8. 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.
9. Probabilistic models are also known as _____.
- (a) Deterministic Models. (b) Stochastic Models.
(c) Dynamic Models. (d) Static Models.
10. Which of the following methods is used to verify the optimality of the current solution of the transportation problem.
- (a) Least cost method. (b) Vogel's approximation method.
(c) Modified distribution method. (d) All of the above.

(10 × 1 = 10 marks)

Part II (Short Essay Questions)

Answer any eight questions.

Each question carries 2 marks.

11. What are analogue models ?
12. Explain transportation problem.
13. Explain Laplace criterion.
14. What is Decision Tree ?
15. Explain value of the game.
16. What is linear programming problems?
17. What is feasible solution ?
18. What do you mean by Mixed strategy ?

19. Explain saddle point
20. What is dummy activity ?

(8 × 2 = 16 marks)

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

21. What are the functions of Operation Research ?
22. Differentiate between CPM and PERT.
23. Discuss the assumptions of game theory.
24. Explain (a) Minimax ; (b) Maximini ; (c) Maximini decision criteria.
25. Discuss the basic assumptions of Linear Programming Problem.
26. Draw network for the plant installation project whose activities and their precedence relationships are as given below.

Activity	:	A	B	C	D	E	F	G	H	I
Predecessor	:	-	A	A	-	D	B, C, E	F	E	G, H

27. Anita Electric Company produces two products P_1 and P_2 , Products are produced and sold on a weekly basis. The weekly production cannot exceed 25 for product P_1 and 35 for product P_2 because of limited available facilities. The company employs total of 60 workers. Product P_1 requires 2 man-weeks of labour, while P_2 requires one man-week of labour. Profit margin on P_1 is Rs. 60 and on P_2 is Rs. 40. Formulate this problem as an LP problem.
28. From the following pay off matrix, and details, calculate Expected Monetary Value and decide which of the Acts can be chosen :

Pay off Table

Perfume	Sales		
	S_1	S_2	S_3
A_1	25	400	650
A_2	- 10	440	740
A_3	- 125	400	750

Probabilities are .1, .7, .2 respectively.

(6 × 4 = 24 marks)

Turn over

Part IV (Long Essays)

Answer any two questions.

Each question carries 15 marks.

29. Solve graphically the following linear programming problem :

$$\text{Minimize } Z = 3x_1 + 5x_2$$

$$\text{subject to } -3x_1 + 4x_2 \leq 12$$

$$2x_1 - x_2 \geq -2$$

$$2x_1 + 3x_2 \geq 12, x_1 \leq 4, x_2 \geq 2$$

$$x_1, x_2 \geq 0.$$

30. A project has the following characteristics :

Activity	Most optimistic time (a)	Most pessimistic time (b)	Most likely time (m)
(1-2)	1	5	1.5
(2-3)	1	3	2
(2-4)	1	5	3
(3-5)	3	5	4
(4-5)	2	4	3
(4-6)	3	7	5
(5-7)	4	6	5
(6-7)	6	8	7
(7-8)	2	6	4
(7-9)	5	8	6
(8-10)	1	3	2
(9-10)	3	7	5

Construct a PERT network. Find the critical path and variance for each event.

31. Determine an initial basic feasible solution to the following transportation problem by using (a) The least cost method ; and (b) Vogel's approximation method.

		Destination				Supply
		D ₁	D ₂	D ₃	D ₄	
Source	S ₁	1	2	1	4	30
	S ₂	3	3	2	1	30
	S ₃	4	2	5	9	40
Demand		20	40	30	10	

(2 × 15 = 30 marks)