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FOURTH SEMESTER (CUCBCSS—UG) DEGREE EXAMINATION APRIL 2024

B.B.A.

BBA IVC 04-MANAGEMENT SCIENCE

(2018 Admission only)

Time : Three Hours

Maximum : 80 Marks

Part I

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

1.	1. The difference between total float and head event slack is ————.						
	A)	Free float.	B)	Independent float.			
	C)	Interference float.	D)	Linear float.			
2.	Regret	criterion is also called ————					
	A)	Maximax criterion.	B)	Maximin Criterion.			
	C)	Hurwicz Criteria.	D)	Minimax Criterion.			
3.	In gam	e theory, the outcome or consequen	ce of a	a strategy is referred to as the ————.			
	A)	Pay-off.	B)	Penalty.			
	C)	Reward.	D)	End-game strategy.			
4.	The sol	ution to a transportation problem wit	h <i>m</i> -s	ources and n -destinations is feasible if the numbers			
	of alloc	ations are ————.					
	A)	m + n.	B)	mn.			
	C)	m-n.	D)	m + n - 1.			
5.		is employed in constructi	on ar	nd business problems.			
	A)	Queue.	B)	Replacement.			
	C)	CPM.	D)	PERT.			

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 6. What type of distribution does a time follow in program evaluation review technique model?
        A) Poisson.
                                                B) Exponential.
        C) Normal.
                                               D) Chi-square.
 7. Graphical optimal value for Z can be obtained from -
        A) Corner points of feasible region.
        B) Both A) and C).
        C) Corner points of the solution region.
        D) None of the above.
 8. The dummy source or destination in a transportation problem is added to ———
        A) Satisfy rim conditions.
        B) Prevent solution from becoming degenerate.
        C) Ensure that total cost does not exceed a limit.
        D) The solution not be degenerate.
                        - represent the start or completion of some activity and as such it consumes no
 9. An-
    time.
        A) Activity.
                                                B)
                                                    Event.
        C)
            Slack.
                                               D) Path.
10. An activity in a network diagram is said to be ______ if the delay in its start will further
    delay the project completion time.
        A) Forward pass.
                                               B) Backward pass.
        C) Critical.
                                               D) Non-critical.
                                                                                (10 \times 1 = 10 \text{ marks})
                                            Part II
                                  Answer any eight questions.
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Each question carries 2 marks.

- 11. What are Stochastic models?
- 12. What is constraints in LPP?
- 13. Explain minimax criterion.

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- 14. What is Free Float?
- 15. Write a note on EOL
- 16. What is basic feasible solution in transportation problem ?
- 17. What is zero sum game?
- 18. Explain decision node decision tree.
- 19. Explain optimal solution in LPP.
- 20. Explain Decision trees.

 $(8 \times 2 = 16 \text{ marks})$

Part III

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

- 21. Discuss the advantages of Operation Research.
- 22. State Application of Linear Programming problem.
- 23. Discuss the difference between PERT and CPM.
- 24. Explain the methods of finding the initial feasible solution in transportation problem.
- 25. Write a short note on Decision theory.
- 26. Construct network diagram and determine critical path and project duration :

Job	Predecessor	Job	Predecessor	Job	Predecessor
А	-	F	А	L	G, H
В	-	G	F	М	J, K, L
С	А	Н	D, E	Ν	J, K, L
D	А	J	G, H	0	K, J
Έ	B, C	K	G, H		

27. A factory manufactures two products A and B. To manufacture one unit of A, 1.5 machine hours and 2.5 labour hours are required. To manufacture product B, 2.5 machine hours and 1.5 labour hours are required. In a month, 300 machine hours and 240 labour hours are available. Profit per unit for A is Rs. 50 and for B is Rs. 40. Formulate as LPP.

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28. A decision maker faced with three decision alternatives and four states of nature constructs the following pay off table :

		Acts		
States of Nature	A ₁	$\mathbf{A_2}$	A ₃	$\mathbf{A_4}$
\mathbf{S}_1	5	10	18	25
\mathbf{S}_2	8	7	8	23
\mathbf{S}_3	21	18	12	21
S_4	30	22	19	20

Determine the alternative to be chosen under :

- (i) Maximax Criterion ;
- (ii) Maximin Criterion ; and
- (iii) Minimax Regret Criterion.

 $(6 \times 4 = 24 \text{ marks})$

Part IV (Long Essays)

Answer any **two** questions. Each question carries 15 marks.

29. Solve the Linear Programming Problem graphically :

- 30. The time estimates of a project are given (in days) below :
 - (a) Draw the project network
 - (b) Identify all paths through it and write critical path.
 - (c) Determine the expected project length and standard deviation.
 - (d) What is the probability that project will be completed in 35 days?

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	5				
Activity	to	tm	tp		
1-2	6	12	30		
1–3	3	6	15		
1-4	3	9	27		
2-6	4	19	28		
3-5	3	9	27		
3-6	2	5	8		
4-5	1	4	7		
5 - 6	6	12	30		

31. Find the initial basic feasible solution to the given transportation problem using the North-west corner rule :

From					SUPPLY
	D1	D2	D3	D4	
01	11	13	17	14	250
02	16	18	14	10	300
O3	21	24	13	10	400
DEMAND	200	225	275	250	

 $^{(2 \}times 15 = 30 \text{ marks})$