C 3941 (Pages : 4) Name.....

Reg. No.....

FOURTH SEMESTER B.B.A. DEGREE EXAMINATION, APRIL 2016

(CUCBCSS—UG)

Complementary Course

BBA IVC 04—MANAGEMENT SCIENCE

Time : Three Hours Maximum : 80 Marks

Part I

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

1. Operations research can be applied to

(a) Military. (b) Business.

(c) Administration. (d) All of the above.

2. An optimization model :

(a) Mathematically provides best decision.

(b) Provides decision with limited context.

(c) Helps in evaluating various alternatives constantly.

(d) All of the above.

3. 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.

4. All negative constraints must be written as :

(a) Equality. (b) Non-equality.

(c) Greater than or equal to. (d) Less than or equal to.

5. Any activity which does not consume either any resource or time is a :

(a) Predecessor. (b) Successor.

(c) Dummy. (d) End.

6. The solution to a transportation problem with m-rows and n-columns is feasible if numbers of positive allocations are :

(a) $m + n$. (b) $m + n - 1$.

(c) $m \times n$. (d) $m + n + 1$

Turn over

7. Game theory is the study of :

(a) Selecting optimal strategies. (b) Resolving conflict between players.

(c) Both (a) and (b). (d) None of the above.

8. The sequence of activities which determines the total project time is :

(a) Network. (b) Critical Path.

(c) Critical activities. (d) None of the above.

9. Which of the following might be viewed as an optimistic decision criterion ?

(a) Hurwitz criterion. (b) Maximin.

(c) Maximax. (d) Minimax.

10. Game theory models are classified by :

(a) Number of players. (b) Sum of all pay-off.

(c) Number of strategies. (d) All of the above.

(**10** x **1** = **10** marks)

Part II (Short Answer Questions)

Answer any **eight** *questions.*

11. What do you mean by physical model ?
12. Define linear programming.
13. Define risk.
14. What do you mean by value of the game ?
15. What do you mean by pure strategy ?
16. What is expected opportunity loss ?
17. What do you mean by loop in transportation problems ?
18. What is float ?
19. What is critical path ?
20. What is degeneracy in transportation problems ?

(8 x 2 = 16 marks)

Part III (Short Essays)

Answer any **six** *questions.*

21. List out the various phases in operation research approach to problem solving.
22. What do you mean by a model ? What are its unique characteristics ?

23. Discuss the significance of linear programming problems.

24. What do you mean by decision-making ? Explain various decision-making situations.

25. What do you mean by network analysis ? State its objectives.

26. From the following opportunity loss table determine the best decision strategy

States of Nature	*Action I*	*Action II*	*Action III*
Si	2.0	2.5	3.0
S2	2.0	2.4	2.2
S3	2.6	2.8	3.0

States of natures Si, S2 and S3 assume probabilities 0.4, 0.4 and 0.2 respectively.

27. The XYZ Company during the festival season combines two factors A and B to form a gift pack which must weigh 5 kg. At least 2 kg of A and not more than 4 kg of B should be used. The net profit contribution to the company is Rs. 5 per kg for A and Rs. 6 per kg for B. Formulate LP model to find the optimal factor mix.

28. From the following pay-off matrix of two firms X and Y determine the optimal strategy for both the firms and value of the game under **maximin** and **minmax** principle

Firm Y

		[illegible]	4		
Firm X	[illegible]	8	2		12
	16	8	6	14	12
		11	[illegible]		

(4 x 6 = 24 marks)

Part IV (Long Essays)

Answer any two questions.

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51

29. Solve the following linear programming problem. graphically :

Maximize $Z = 2x_1 + x_2$

subject to $x_1 + 2x_2$ 10

$+ \quad x2 < 6$

$x_1 - x_2 < 2$

$x_1 - 2x_2 < 1$

x1, x2 O.

30. Find the optimum solution to the following transportation problem in which the cells contain th transportation cost in rupees :

	W1	W2	W3	W4	W5	*Available*
F 1	7	6	4	5	9	40
F2	8	5	6	7	8	30
F3	6	8	9	6	5	20
F4	5	7	7	8	6	10
Required	30	30	15	20	5	100

31. From the following data construct a network diagram and determine critical path :

Activity ... 1-2 1-3 2-4 3-4 3-5 4-9 5-6 5-7 6-8 7-8 8-10 9-10

Duration ... 4 1 1 1 6 5 4 8 1 2 5 7

(2 x 15 = 30 marks)