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) $m + n + 1$

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 × 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 × 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*
S1	2.0	2.5	3.0
S2	2.0	2.4	2.2
S3	2.6	2.8	3.0

States of natures S1, 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

Firm X					
	3	– 1	4	6	7
	– 1	8	2	4	12
	16	8	6	14	12
	1	11	– 4	2	1

(4 × 6 = 24 marks)

Part IV (Long Essays)

Answer any **two** *questions.*

29. Solve the following linear programming problem graphically :

Maximize $Z = 2x_1 + x_2$

subject to $x_1 + 2x_2 \leq 10$

$x_1 + x_2 \leq 6$

$x_1 - x_2 \leq 2$

$x_1 - 2x_2 \leq 1$

$x_1, x_2 \geq 0.$

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

	W1	W2	W3	W4	W5	*Available*
F1	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 × 15 = 30 marks)