

28. Explain any three methods of obtaining initial feasible solution for transportation problem?
(6 × 4 = 24 Marks)

Part D

Answer any *two* questions. Each question carries 10 mark.

29. “OR tool is used in different areas of management” Explain?
30. A diet conscious housewife wishes to ensure certain minimum intake of vitamins A, B, C for the family. The minimum daily (quantity) needs of the vitamins A, B, C for the family are respectively 30, 20 and 16 units. For the supply of these vitamin requirements, the housewife relies on two fresh foods. The first one provides 7, 5, 2 units of the vitamins per gram respectively and the second one provide 2, 4, 8 units of the same three vitamins per gram of the food stuff respectively. The first food stuff cost Rs.3 per gram and the second Rs. 2 per gram. The problem is how many grams of each food stuff should house wife buy every day to keep food bill as low as possible.
31. A project has the following time schedule.

Activity	1-2	1-3	1-4	2-5	3-6	3-7	4-6	5-8	6-9	7-8	8-9
Duration months	2	2	1	4	8	5	3	1	5	4	3

Construct network and compute.

- (1) EST, LST, EFT and LFT of the activities
(2) Total float for each activity
(3) Critical path and its duration.

(2 × 15 = 30 Marks)

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(Pages: 4)

Name:

Reg. No:

FOURTH SEMESTER B.B.A. DEGREE EXAMINATION, APRIL 2021

(CUCBCSS-UG)

CC15U BB4 C04 - MANAGEMENT SCIENCE

(Complementary Course)

(2015 to 2018 Admissions - Supplementary)

Time: Three Hours

Maximum: 80 Marks

Part A

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

Fill in the blanks:

- Modern scientific management research originated during
- helps management to evaluate alternative course of action for selecting the best course of action
- OR provides solution only if the elements are
- Liner programming is
- The best use of linear programming technique is to find an optimal use of

Choose the correct answer:

- Theory is an important operations research technique to analyze the queuing behavior.
a) Waiting line b) Network c) Decision d) None
- is an important Operations research technique to be used for determining optimal allocation of limited resources to meet the given objectives.
a) Waiting line theory b) Network analysis
c) Decision analysis d) Linear programming
- Constraints in an LP model represent
- Limitations b) Requirements
c) Balancing limitation d) all of the above
- OR techniques helps to find solution
a) Feasible b) Non feasible c) Optimal d) Non optimal
- Operations research approach is
- a) Multi-disciplinary b) Scientific c) Intuitive d) All of the above

(10 × 1 = 10 Marks)

Part B

Answer any *eight* questions. Each question carries 2 marks.

11. What is Operation Research?
12. What are the characteristics of OR?
13. Explain any four applications of LPP in management?
14. A company has two types of boxes say P and Q. Box P is a superior quality and box Q is lower quality. Profits on box P and box Q are Rs.5 and Rs.3 per box respectively. Raw materials required for each box P is twice as that of box Q. The supply of raw material is sufficient only for Rs.1000 box of Q per day. Box P requires a special clip and only 400 such a clip is available per day. For box Q, only 700 clips are available per day. Formulate the problem in to L.P.P
15. Solve graphically for the following problem.

$$\text{Max } Z = 3x_1 + 4x_2$$

$$\text{Subject to } x_1 + x_2 \leq 450$$

$$2x_1 + x_2 \leq 600$$

$$x_1, x_2 \geq 0$$
16. A project consists of six activities(jobs) designated from A to F, with the following relationships
 - (i) A is the first job to be performed
 - (ii) B and C can be done concurrently, and must follow A
 - (iii) B must precede D
 - (iv) E must succeed C but it cannot start until B is completed
 - (v) The last operation F is dependent on the completion of D & E. Draw the network diagram
17. Define 'event' and 'activity'?
18. Find the initial feasible solution to the transportation problem given below, by north west corner rule.

Origins	Destination			Supply
	D1	D2	D3	
O1	2	7	4	5
O2	3	3	1	8
O3	5	4	7	7
O4	1	6	2	14
Demand	7	9	18	

(2)

19. A small ink manufacturer produces a certain type of ink at a total average cost of Rs. 3 per bottle and sells at a price of Rs. 5 per bottle. The ink is produced over the week-end and is sold during the following week. According to the past experience the weekly demand has never been less than 78 or greater than 80 bottles in this place. You are required to formulate pay off table.
20. What are the transportation problems?

(8 × 2 = 16 Marks)

Part C

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

21. What are the applications of OR in modern business management?
22. A firm manufactures trucks and buses. Inputs available are 720man years. 1900 machine weeks and 1900 tons of steel. Production of a truck requires 1 man –year, 3 machine-week and 5 tons of steel. Production of a bus requires 2 man- year. 1 machine – week and 4 tons of steel. Draw the production possibility curve. If the price of truck is 60.000 and the price of a bus is Rs.80.000. Determine the maximum output.
23. Solve graphically the following linear programming problem.

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

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

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

$$2x_1 + 3x_2 \geq 12$$

$$x_1 \leq 4, x_2 \geq 2$$

$$x_1, x_2 \geq 0$$

24. Explain the various steps involved in a PERT calculation.
25. What are the techniques used in OR?
26. Explain the difference between PERT and CPM.
27. Solve the following LPP graphically

$$\text{Min. } Z = 2X_1 + 3X_2$$

$$\text{Subject to: } X_1 + X_2 \leq 30$$

$$X_2 \geq 3$$

$$0 \leq X_2 \leq 12$$

$$X_1 - X_2 \leq 0$$

$$0 \leq X_1 \leq 20$$

(3)

Turn Over