

QP CODE: 20101051



Reg No

Name

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BCA DEGREE (CBCS) EXAMINATION, MARCH 2020

Fourth Semester

Bachelor of Computer Application

Complementary Course - MM4CMT03 - OPERATIONS RESEARCH

2017 ADMISSION ONWARDS

D5ACB3CF

Time: 3 Hours

Marks: 80

Part A

Answer any ten questions.

Each question carries 2 marks.

- 1. Explain the nature of operation research
- 2. Briefly describe some application of operation research in functional areas of management.
- 3. Describe any 2 limitations of OR.
- 4. What you mean by analogue model model.? Give any 2 examples.
- 5. What is a linear programming problem?
- 6. What are the characteristics of linear programming problems?
- 7. When is the solution to a LPP infeasible?
- 8. Distinguish between feasible solution and basic feasible solution.
- 9. What is a loop in Transportation problem?
- 10. Write the reason for unbalanced TP.
- 11. Define a game.
- 12. What is the value of the game and who will be the winner of the game.

$$\begin{bmatrix} 1 & -2 \\ 2 & -1 \end{bmatrix}$$

 $(10 \times 2 = 20)$

Part B

Answer any six questions.

Each question carries 5 marks.

13. Define OR. Explain the origin of OR.



- 14. Explain the use of OR in defence and in Industry.
- 15. Solve graphically the following problems

$$Min Z = -x+2y$$

- 16. Expalin the steps followed in Bog method.
- 17. Determine the initial BFS of the transportation problem byVogel's approximation method.

| | | Destina | | | |
|--------|----|---------|----|----|--------|
| Origin | Α | В | C | D | Supply |
| 1 | 1 | 5 | 3 | 3 | 34 |
| 2 | 3 | 3 | 1 | 2 | 15 |
| 3 | 0 | 2 | 2 | 3 | 12 |
| 4 | 2 | 7 | 2 | 4 | 19 |
| Demand | 21 | 25 | 17 | 17 | |

18.

| | | Job | | | |
|-----------|---|-----|----|----|--|
| Workers B | | × | у | z | |
| | Α | 18 | 17 | 16 | |
| | В | 15 | 13 | 14 | |
| | С | 19 | 20 | 21 | |

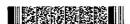
Formulate this assignment problem as an LPP.

19. Given below is a matrix showing the profit for different jobs done through different machines. Find an assignment programme which will maximize the total profit.

| Machines | | | | | |
|----------|----|----|----|----|--|
| | M1 | M2 | M3 | M4 | |
| J2 | 51 | 53 | 54 | 50 | |
| J2 | 47 | 50 | 48 | 50 | |
| J3 | 49 | 50 | 60 | 61 | |
| J4 | 63 | 64 | 60 | 61 | |

- 20. What is the principle of dominance and explain the modified dominance property
- 21. Explain two person zero sum game.

 $(6 \times 5 = 30)$





Part C

Answer any two questions.

Each question carries 15 marks.

22. A company produces two types of products say type A and B. Product B is superior quality and product A is of lower quality. Profits on the two types of products are rs. 30 and Rs. 40 respectively. The dataon resource required, and available of resources are given below:

| | Requ | Capacity | |
|-----------------------------|-----------|-----------|-------|
| | Product A | Product B | |
| Raw materials (kg) | 60 | 120 | 12000 |
| Machining (hours per piece) | 8 | 5 | 600 |
| assembly(Man hour) | 3 | 4 | 500 |
| | | | |

Solve using Simplex method

23. a)Explain the steps in North west corner rule.

b)Find the intial basic feasible solution of the following transportation problem using the north west corner rule

| | D1 | D2 | D3 | D4 | Supply | |
|--------|----|----|----|----|--------|---|
| 01 | 6 | 4 | 1 | 5 | 14 | - |
| O2 | 8 | 9 | 2 | 7 | 16 | |
| 03 | 4 | 3 | 6 | 2 | 5 | |
| Demand | 6 | 10 | 15 | 4 | 35 | |

- 24. a)Define transportation problem and asignment problem.
 - b) Distinguish between transportation and assignment problem.and write the mathematical representation of both.
- 25. (a) What do you ean by mixed strategy in game theory and how it is solved.
 - (b) Player A is paid Rs. 8 if two coins turn both head and Rs. 10 if two coins turn both tails. Plyer B is paid Rs. 3 when the two coins do not match. Given the choice of being A or B, which one would you choose and what would be your strategy.

(2×15=30)

