SECOND SEMESTER B.C.A. DEGREE EXAMINATION, APRIL 2020

(CBCSS - UG)

CC19U BCA2 C04 : OPERATION RESEARCH

(Mathematics - Complementary Course)

(2019 Admission : Regular)

Time: 2.00 Hrs   Max. Marks: 60

Credit: 3

(Draw diagram wherever necessary.The students can answer all questions in sections A & B)

A. Short answer questions. Each question carries 2 marks.

1. Explain the growing importance of O. R. in decision making

2. " Operations research is an aid for the executive in making his decisions based on scientific method analysis" Explain the statement briefly.

3. Explain surplus variable with an example.

4. Define the basic variables and the basic vector.

5. Define a standard primal form and its dual problem for maximization problem.

6. Find an initial basic feasible solution to the following transportation problem using Least-Cost Method.

	D_1	D_2	D_3	D4	Availability
O_1	12	8	2	10	28
O_2	16	18	4	14	32
O_3	8	6	12	4	10
Requirements	12	20	30	8	

7. Define a transhipment problem.

8. Write the mathematical formulation of a general assignment problem.

9. What you mean by successor activity?

10. Define float of an activity.

11. What are the limitations of Critical Path Method (CPM)?

12. A project schedule has to the following characteristics

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

From the above information construct a network diagram.

(Ceiling: 20 Marks)

B. Short essay questions (Paragraph). Each question carries 5 marks.

13. Give three applications of OR in the functional areas of management.

14. Check degeneracy of the LPP

Maximize $z = 2x + y$

Subject to $4x + 3y \leq 12$

$4x + y \leq 8$

$4x - y \leq 8$

$x, y \geq 0$

15. Find an initial basic feasible solution to the following transportation problem by Vogel's approximation method

	A	B	C	D	Availability
I	6	1	9	3	70
II	11	5	2	8	55
III	10	12	4	7	90
Requirement	85	35	50	45	

16. Solve the following assignment problem to find the maximum total expected sale

	I	II	III	IV
A	42	35	28	21
B	30	25	20	15
C	30	25	20	15
D	24	20	16	12

17. Solve the following travelling salesman problem to minimize the cost per cycle:

From\To	A	B	C	D	E
A	∞	2	5	7	1
B	6	∞	3	8	2
C	8	7	∞	4	7
D	12	4	6	∞	5
E	1	3	2	8	∞

18. Give some of the basic terms used in sequencing.

19. Discuss the processing of n jobs through k machines.

(Ceiling: 30 Marks)

C. Essay questions. Answer any one question.

20. Use two phase method to

Maximize $z = 5x - 4y + 3z$ Subject to

$2x + y - 6z = 20$

$6x + 5y + 10z \leq 76$

$8x - 3y + 6z \leq 50$

$x, y, z \geq 0$

21. Solve the following transportation problem to maximize the profit.

	1	2	3	4	Demand
A	42	27	24	35	200
B	46	37	32	32	60
C	40	40	30	32	140
Supply	80	40	120	60	

(1 × 10 = 10 Marks)

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