C 82409

Name..

Reg. No.....17.......................

SECOND SEMESTER B.A./B.Sc. DEGREE EXAMINATION, APRIL 2020

(CBCSS—UG)

B.C.A.

BCA 2C 04—OPERATIONS RESEARCH

(2019 Admissions)

Maximum : 60 Marks

Time : Two Hours

Section A (Short Answer Type Questions)

Answer all the questions.
Each question carries maximum of 2 marks.
Ceiling 20 marks.

1. Write any *two* applications of OR ?

2. What do you mean by an objective function of an LPP ?

3. What are the basic assumptions of a LPP ?

4. What do you mean by an artificial variable ?

5. What do you mean by basic feasible solution of a Transportation problem ?

6. What are Assignment problems ?

7. Define Travelling salesman problem.

8. What do you mean by Degeneracy in a TP ?

9. What is network analysis ?

10. What is meant by a Critical path ? Why should we know which activities are critical ?

11. What is dummy activity ?

12. Distinguish between 'Slack' and 'float'.

(Ceiling : 20 marks)

Section B (Short Essay Type Questions)

Answer all the questions.
Each question carries 5 marks.
Ceiling 30 marks.

13. What are the limitations of OR ?

14. Solve Graphically :

    Maximize $= 3x_1 + 5x_2$

    subjected to : $x_1 + 2x_2 \leq 2,000$

    $x_1 + x_2 \leq 1,500$

    $x_2 \leq 600$

    $x_1, x_2 \geq 0.$

15. A manufacturer of furniture makes two products, chairs and tables. Processing of these products is done on two machines A and B. A chair requires 2 hours on machine A and 6 hours on machine B. A table requires 5 hours on machine and no time on machine B. There are 16 hours of time per day available on machine A and 30 hours on machine B. Profit gained by the manufacturer from a chair is Re. 1 and from a table is Rs. 5 respectively. Formulate the problem into a LPP in order to maximise the total profit ?

16. Find the initial solution of the following TP by using Lowest cost entry method :

	D_1	D_2	D_3	*Supply*
O_1	2	7	4	5
O_2	3	3	1	8
O_3	5	4	7	7
O_4	1	6	2	14
Demand	7	9	18	

17. Find the optimal solution to the following Assignment problem showing the cost for assigning workers to jobs :

$$
\begin{array}{c}
\quad\quad x \quad y \quad z \\
\text{Workers} \begin{bmatrix} 18 & 17 & 16 \\ 15 & 13 & 14 \\ 19 & 20 & 21 \end{bmatrix}.
\end{array}
$$

18. Draw a network diagram to the following set of activities :

Activities	Proceeding activities
A	-------
B	-------
C	A
D	A
E	B and C
F	B and C
G	B and C
H	D and E
I	F
J	F
K	G
L	H and I
M	H and I
N	J, K and L

19. Distinguish between PERT and CPM.

(Ceiling : 30 marks)

Section C (Essay Type Questions)

Answer any **one** *question.*
Each question carries **10** *marks.*

20. Solve the following LPP by using Two-phase simplex method :

Maximize $Z = 5x_1 + 8x_2$

subjected to $3x_1 + 2x_2 \geq 3$

$x_1 + 4x_2 \geq 4$

$x_1 + x_2 \leq 5 : x_1, x_2 \geq 0.$

Turn over

21. Solve the following minimal assignment problems :

	I	II	III	IV	V
A	1	3	2	3	6
B	2	4	3	1	5
C	5	6	3	4	6
D	3	1	4	2.	2
E	1	5	6	5	4

(1 × 10 = 10 marks)