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(20322)

Roll No. ....

B. Sc.(Hons.)(Com. Sc.)-III Sem.

## NS-3300(CV-III)

**B. Sc. (Hons.) Examination, Dec. 2021**

**COMPUTER SCIENCE**

**Mathematics-III (CBOT)**

**(BHCS-303)**



*Time : 1½ Hours]*

*[Maximum Marks : 75*

*Note : Attempt questions from all Sections as per instructions.*

### **Section-A**

**(Very Short Answer Type Questions)**

Attempt any *two* questions out of the following five questions. Each question carries 7½ marks.

Very short answer is required.

7½×2=15



1. Discuss the significance and scope of operation research in modern management.
2. Explain the term 'artificial variable' and its use in linear programming.
3. Prove that the transportation problem always possesses a feasible solution.
4. What is a project? Give two examples.
5. Define saddle point and the value of game with example.

### Section-B

#### (Short Answer Type Questions)

Attempt any *one* question out of the following three questions. Each question carries 15 marks.

Short answer is required.

$$15 \times 1 = 15$$



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6. Use two-phase simplex method to solve the problem :

Minimize :  $z = \frac{15}{2}x_1 - 3x_2$

Subject to constraints :

$$3x_1 - x_2 - x_3 \geq 3$$

$$x_1 - x_2 + x_3 \geq 2$$

and

$x_1, x_2, x_3 \geq 0.$

7. Explain the application of Vogel's approximation method (VAM) with an example.

8. Solve the following  $(2 \times 4)$  game :

		B			
		I	II	III	IV
A	I	2	2	3	-1
	II	4	3	2	6



## Section-C

## (Detailed Answer Type Questions)

Attempt any *two* questions out of the following five questions. Each question carries  $22\frac{1}{2}$  marks.

Answer is required in detail.

$$22\frac{1}{2} \times 2 = 45$$

9. Write short notes on the following :
- (i) Role of operation research in a decision-making science.
  - (ii) Advantages and limitations of operation research study
  - (iii) Static and dynamic model.

10. Solve the following problem by dual simplex method :

Maximize :  $z = -2x_1 - x_3$

Subject to :

$$x_1 + x_2 - x_3 \geq 5$$

$$x_1 - 2x_2 + 4x_3 \geq 8$$

and

$$x_1, x_2, x_3 \geq 0.$$



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11. Determine the optimum basic feasible solution of the following transportation problem :

	A	B	C	Available
I	50	30	220	1
II	90	45	170	3
III	250	200	50	4
Requird	4	2	2	

12. A project has the following time schedule :

Activity	Time in weeks
1-2	4
1-3	1
2-4	1
3-4	1
3-5	6
4-9	5
5-6	4
5-7	8
6-8	1
7-8	2
8-9	1
8-10	8
9-10	7



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Construct the PERT network and compute :

- (i)  $T_E$  and  $T_l$  for each events
- (ii) Float for each activity
- (iii) Critical path and its duration.

13. Explain maxi-min and mini-max principles used in Game theory.



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