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A

(20322)

Roll No. .....

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

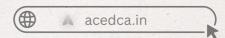
# NS-3300(CV-III)

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

#### **COMPUTER SCIENCE**

**Mathematics-III (CBOT)** 

(BHCS-303)



Time: 11/2 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  $7\frac{1}{2}$  marks. Very short answer is required.  $7\frac{1}{2} \times 2 = 15$ 

- 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:

$$3x_{1} - x_{2} - x_{3} \ge 3$$

$$x_{1} - x_{2} + x_{3} \ge 2$$
and
$$x_{1} - x_{2} + x_{3} \ge 0$$

$$x_{2} - x_{3} \ge 0$$
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- 7. Explain the application of Vogel's approximation method (VAM) with an example.
- 8. Solve the following  $(2 \times 4)$  game:

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#### 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 decisionmaking science.
  - (ii) Advantages and limitations of operation research study..in
  - (iii) Static and dynamic model.
- 10. Solve the following problem by dual simplex method:

Maximize:  $z = -2x_1 - x_3$ 

Subject to:

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

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

and

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

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

	Α	В	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	acedca.in4
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

Construct the PERT network and compute:

- (i)  $T_E$  and  $T_I$  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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