



## Avinashilingam Institute for Home Science and Higher Education for Women

Deemed to be University Estd. u/s 3 of UGC Act 1956, Category 'A' by MHRD (now MoE)

Re-accredited with 'A++' Grade by NAAC. CGPA 3.65/4, Category I by UGC

Coimbatore - 641 043, Tamil Nadu, India

### Continuous Internal Assessment Test I – February 2025 Semester-II

Class: I PG  
Major: Computer Applications

Time: 2 hours  
Max. Marks: 60

#### 23MCAC08 Optimization Techniques

#### Course Outcomes:

1. Formulate a real-world problem as a mathematical programming model with application software.
2. Solve the Linear Problems and analyze the simplex and dual simplex principles.
3. Apply optimality and allocation methods for resources.
4. Demonstrate network scheduling concepts and apply critical path analysis and time estimate for real time project completion.
5. Apply sequencing algorithm for job scheduling.

#### Part-A

6x1=6

#### Choose the correct answer

- 1) The general LPP is in standard form if the constraints are  
a.  $\leq$  type    b.  $\geq$  type    c. Strict equations    d.  $\neq$  type    CO1K1
- 2) Graphical method of solving LPP is applicable for \_\_\_ variables problem.  
a. 2    b. 3    c. 4    d. any number of    CO2K2
- 3) The number of basic variables of the general transportation problem at any stage of feasible solution must be \_\_\_\_\_  
a.  $m+n-1$     b.  $m-n+1$     c.  $m-n-1$     d.  $m+n+1$     CO3K1
- 4) The method that is used to determine an assignment schedule is \_\_\_\_\_  
a. NWCR    b. LCEM    c. VAM    d. HUNGARIAN    CO3K1
- 5) LCEM stands for \_\_\_\_\_ CO3K2  
a. Least Cost Entry Method    b. Lowest Cost Entry Method  
c. Least Cost Elimination Method    d. Lowest Cost Elimination Method
- 6) The method used to calculate OBFS to a TP is \_\_\_\_\_ CO3K1  
a. NWCR    b. LCEM    c. VAM    d. MODI

#### Part- B

3x6=18

#### Answer ALL Questions

Each answer should not exceed 400 words or two pages

7. (a) Use graphical method to  
Maximize  $Z = x_1 + 3x_2$   
Subject to the constraints:  
 $3x_1 + 6x_2 \leq 8$   
 $5x_1 + 2x_2 \leq 10$   
 $x_1, x_2 \geq 0$     CO1K3  
(or)
7. (b) Use graphical method to  
Minimize  $Z = 5x_1 + 3x_2$   
Subject to the constraints:  
 $x_1 + x_2 \leq 2$   
 $5x_1 + 2x_2 \leq 10$   
 $3x_1 + 8x_2 \leq 12$   
 $x_1, x_2 \geq 0$     CO2K3

8. (a) Use Least Cost Entry method to find the IBFS to the following transportation problem: CO3K3

A	B	C	
II	50	30	220
II	90	45	170
III	250	200	50
	4	2	2

(or)

8. (b) Write the steps involved in VAM.

CO3K2

9. (a) Solve the following assignment problem

CO3K3

	1	2	3	4
A	10	12	19	11
B	5	10	7	8
C	12	14	13	11
D	8	15	11	9

(or)

9. (b) Write the mathematical model of Assignment problem and also write the steps involved in Hungarian Assignment method.

CO3K2

**Part C**

**3x12=36**

**Answer all questions**

**Each answer should not exceed 800 words or four pages**

10. (a) Use Big - M method to

CO2K4

Maximize  $Z = x_1 - x_2 + 3x_3$

Subject to the constraints:

$x_1 + x_2 \leq 20$

$x_1 + x_3 = 5$

$x_2 + x_3 \geq 10$

$x_1, x_2, x_3 \geq 0$

(or)

10. (b) Use Simplex method to

CO2K3

Maximize  $Z = 5x_1 + 3x_2$

Subject to the constraints:

$x_1 + x_2 \leq 2$

$5x_1 + 2x_2 \leq 10$

$3x_1 + 8x_2 \leq 12$

$x_1, x_2 \geq 0$

11. (a) Obtain an optimum basic feasible solution to the following Transportation problem (use VAM to find IBFS)

CO3K4

	W <sub>1</sub>	W <sub>2</sub>	W <sub>3</sub>	W <sub>4</sub>	
F <sub>1</sub>	19	30	50	10	7
F <sub>2</sub>	70	30	40	60	9
F <sub>3</sub>	40	8	70	20	18
	5	8	7	14	

(or)

11. (b) Write the mathematical model of Transportation problem and also write the algorithm of MODI Technique. CO3K4

12. (a) Solve the assignment problem CO3K4

	7	8	9	10	11	12
1	31	62	29	42	15	41
2	12	19	39	55	71	40
3	17	29	50	41	22	22
4	35	40	38	42	27	33
5	19	30	29	16	20	22
6	72	30	30	50	41	20

(or)

12. (b) Use assignment technique to find the maximum profit that may be expected if an optimum assignment is made for the following: CO3K4

	A	B	C	D	E
1	32	38	40	28	40
2	40	24	28	21	36
3	41	27	33	30	37
4	22	38	41	36	36
5	29	33	40	35	39

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**Staff Incharge: Dr.V. Radha, Professor**