Paper Code: MCA315	Roll No.										

MCA
(SEM-III) THEORY EXAMINATION 2016-17
COMPUTER BASED OPTIMIZATION TECHNIQUES

[Time: 3hrs] **[Max. Marks: 100]**

Note- Attempt all questions. All questions carry equal marks.

Q1. Attempts any two of the following:

A) Discuss the significance and scope of computer based optimization techniques in morden age.

B) ABC Food Company is developing a low- caloric high protein diet supplement called Hi-pro. The specifications for Hi-pro have been established by a panel of medical experts. These specifications along with the caloric, protein and vitamin contents of three basic foods are given in the table.

Nutritional Elements	Units of Nutritional Elements (per 100 gm. Serving of basic foods)			Basic foods Hi-pro Specifications
	1	2	3	
Calories	350	250	200	300
Proteins	250	300	150	200
Vitamin A	100	150	75	100
Vitamin C	75	125	150	100
Cost per serving Rs.	1.50	2.00	1.20	

What quantities of foods 1,2 and 3 should be used ? Formulate and solve this problem as linear programming problem as linear programming problem to minimize cost of serving.

C) Develop algorithm for graphical method for solving any linear programming problem. List all the assumptions made.

Q2. Attempt any two of the following:

A) Discuss the limitations of graphical methods.

B) Maximize $z = 3x_1 + 2x_2$

Subject to the conditions

$2x_1 + x_2 \leq 40$

$2x_1 + 3x_2 \leq 60$

$x_1 + x_2 \leq 24$

$x_1 , x_2 \geq 0$

C) Develop algorithm for simplex method for solving any linear programming problem. List all the assumptions made.

Q3. Attempt any two of the following:

A) What do you understand by unbalanced transportation problem? How unbalanced Transportation problem is made a balanced transportation problem.

B) Develop Algorithm for North West corner Method for transportation problem.

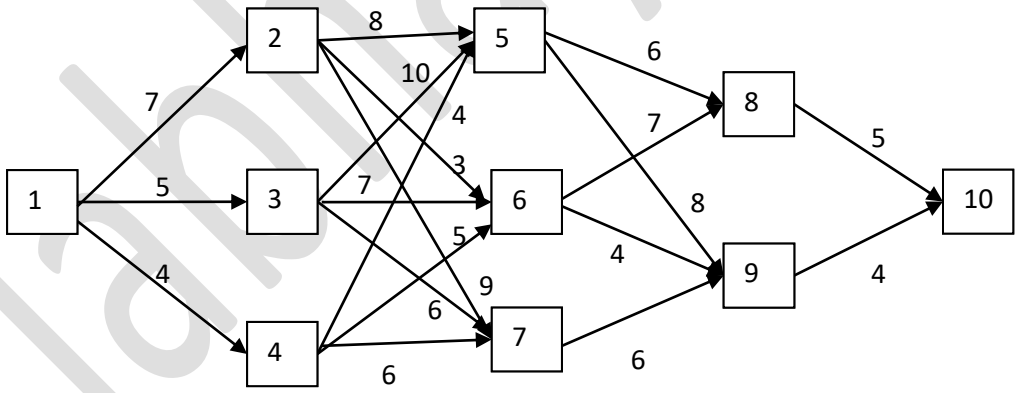
C) Four jobs A, B, C and D are to be assigned to 4 workers 1, 2, 3 and 4. The respective profits in rupees of this assignment are given in the following matrix. Determine the optimal assignment to maximize the profit.

JOB → / WORKER ↓	**A**	**B**	**C**	**D**
1	21	15	19	16
2	19	16	20	20
3	10	20	18	17
4	18	17	19	20

Q4. Attempt any two of the following:

A) Discuss the characteristics & applications of Dynamic programming.

B) Find the route of travelling so that total travelling cost becomes minimum in the following fig. where starting point is 1 and destination point is 10 and numbers on arrow indicate cost of travel from one point to another.



C) What is economic order quantity? Drive the formula for determining EOQ.

Q5. Write short notes on any two of the following:

A) Characteristics of Integer Programming.

B) Cost associated with inventory control system.

C) Basic element of queues.