MEPL CLASSES

CMA INTER

OM – TRANSPORTATION

WEBSITE – www.meplclasses.com

EMAIL-ID – d2hclasses@mohitsir.com

ADDRESS – 59, JATINDRA MOHAN AVENUE, SOVABAZAR, KOLKATA – 700005

(TIME ALLOTED – 90 MINUTES) (MARKS ALLOTED – 40 MARKS)

EACH QUESTION CARRIES 5 MARKS

Question 1.

Ladies Fashion Shop wishes to purchase the following quantity of summer dresses

Dress size	I	II	III	IV
Quantity	100	200	450	150

Three manufacturers are willing to supply dresses

The quantities given below are the maximum that they are able to supply of any given combination of orders for dresses:

Manufacturers	A	B	C
Total quantity	150	450	250

The shop expects the profit per dress to vary with the manufacturer as given below:

Size

	I	II	III	IV
A	₹2.5	₹4.0	₹5.0	₹2.0
B	₹3.0	₹3.5	₹5.5	₹1.5
C	₹2.0	₹4.5	₹4.5	₹2.5

Required:

(a) Use the transportation technique to solve the problem of how the orders should be placed with the manufacturers by the fashion shop in order to maximize profit.

(b) Explain how you know there is no further improvement possible.

Question 2.

The products of three plants F1, F2 and F3 are to be transported to 5 warehouses W1, W2, W3, W4 and W5. The capacities of plants, demand of warehouses and the cost of transportation from one plant to various warehouses are indicated in the following table:

	W1	W2	W3	W4	W5	Plant Capacity
F1	74	56	54	62	68	400
F2	58	64	62	58	54	500
F3	66	70	52	60	60	600
Warehouse Demand	200	280	240	360	320	1500/1400

(a) Find out a distribution plan of products from plants to the warehouses at a minimum cost. What is the minimum cost?
(b) Is there any surplus capacity of the plants? If so, in which plant should we associate that surplus capacity?
(c) Is there any alternate solution for the optimum solution achieved in

Question 3.

A company has 4 factories F1, F2, F3, & F4 manufacturing the same product. Production & row material cost differ from factory to factory and are given in the following table in the first two rows.

The transportation cost from factories to sales departments S1, S2, S3, are also given. The last two columns in the table give the sales price & the total requirement at each sales department.
The production capacity of each factory is given in the last row.

Factories / Sales Dept.	F_1	F_2	F_3	F_4	Sales price/unit	Requirement
Production cost/unit	15	18	14	13		
Row material cost/unit	10	9	12	9		
Transportation Cost/unit S_1	3	9	5	5	34	80
S_2	1	7	4	5	32	120
S_3	5	8	3	6	31	150
Availability	10	150	50	100		

Determine the most profitable production & the distribution schedule & the corresponding profit. The surplus product should be taken to yield zero profit.

Question 4.

The Bombay Transport Company has trucks available at four different sites in the following numbers:

Site A	5 Trucks
Site B	10 Trucks
Site C	7 Trucks
Site D	3 Trucks

Customers – W, X and Y require trucks as shown below.

Customer W	5 Trucks
Customer X	8 Trucks
Customer Y	10 Trucks

Variable Costs of getting trucks to the Customers are given below:

From A to W	₹ 7, to X	₹ 3, to Y	₹ 6
From B to W	₹ 4, to X	₹ 6 to Y	₹ 8
From C to W	₹ 5, to X	₹ 8 to Y	₹ 4
From D to W	₹ 8 to X	₹ 4 to Y	₹ 3

Solve the above transportation problem.

Question 5.

A company has 3 plants located at different places but producing an identical product. The cost of production, distribution cost of each plant to the 3 different warehouses, the sale price at each warehouse and the individual capacities for both the plant and warehouse are given below:

Plants	F1	F2	F3		
Raw material	15	18	14		
Other expenses	10	9	12		
Distribution cost to warehouse				Sales Price in (₹)	Warehouse Capacity (No)
W1	3	9	5	34	80
W2	1	7	4	32	110
W3	5	8	3	31	150
Capacity of Plant (No.)	150	100	130		

Establish a suitable table giving net profit/loss for a unit produced at different plants and distributed at different locations.

(a) Introduce a suitable dummy warehouse / plant so as to match the capacities of plants and warehouses.
(b) Find distribution pattern so as to maximise profit / minimise loss.
(c) Interpret zero value of square evaluation of an empty cell and find alternative solutions.

Question 6.

By Vogel approximation (or unit penalty) method, solve the following transportation problem.

O \ D	14	8	23
17	13	15	16
12	7	11	2
16	19	20	9

Question 7.

Write a short note on Transportation model .

Question 8.

What are the various methods to obtain the "initial basic feasible solution " ?