SURESH GYAN VIHAR UNIVERSITY — Accredited by NAAC with 'A' Grade		**INTERNAL ASSIGNMENT - 1**
Course	MCA	**Optimization Technique**
Semester	4	
Total Marks:	15	

Q.1. Write answers for any two questions from below. (5 marks each – Word limit – 500)

A. A second cashier is added to the grocery store in Problem 9, and this cashier works at the same rate as the original one. Assume the arrival rate does not change.
a) What is the average length of the line?
b) How many minutes does the average customer spend waiting in line?
c) How many minutes typically elapse from the time the person enters the line until the person pays the cashier and leaves the system?
d) Find the probability that the number in the system is 1, 2, and 3.

B. The National Credit Union has Rs250, 000 available to invest in a 12-month commitment. The money can be placed in Treasury notes yielding an 8% return or in municipal bonds at an average rate of return of 9%. Credit union regulations require diversification to the extent that at least 50% of the investment be placed in Treasury notes. Because of defaults in such municipalities as Cleveland and New York, it is decided that no more than 40% of the investment be placed in bonds. How much should the National Credit Union invest in each security so as to maximize its return on investment?

C. A company plans to consume 9000 pieces of a particular component. Past records indicate that purchasing department had used Rs. 12,000 for placing 500 orders. If the price of component is Rs. 12 and inventory carrying cost is 10% of cost.
Find:
i)The economic order quantity.
ii) Total cost of inventory.
iii) The number of orders per year

Q.2. Write short notes on all of the following topics (1 mark each - Word limit - 100)

A. Infeasible Solution

B. Graphical Method

C. Limitations of LPP

D. CPM AND PERT: Network Representation

E. Economic order Quantity for purchase model.

	SURESH GYAN VIHAR UNIVERSITY	INTERNAL ASSIGNMENT - 2
	Accredited by NAAC with 'A' Grade	

Course	MCA	
Semester	4	**Optimization Technique**
Total Marks:	15	

Q.1. Write answers for any two questions from below. (5 marks each – Word limit – 500)

A. The Sweet Smell Fertilizer Company markets bags of manure labeled "not less than 60 pounds dry weight." The packaged manure is a combination of compost and sewage wastes. To provide good-quality fertilizer, each bag should contain at least 30 pounds of compost but no more than 40 pounds of sewage. Each pound of compost costs Sweet Smell 5 cents and each pound of sewage costs 4 cents. Use linear programming to determine the least cost blend of compost and sewage in each bag.

B. The Marriott Tub Company manufactures two lines of bathtubs, called model A and model B. Every tub requires a certain amount of steel and zinc; the company has available a total of 25,000 pounds of steel and 6,000 pounds of zinc. Each model A bathtub requires a total of 125 pounds of steel and 20 pounds of zinc, and each yields a profit of Rs90. Each model B bathtub can be sold for a profit of Rs70; it in turn requires 100 pounds of steel and 30 pounds of zinc. Find the best production mix of the bathtubs.

C. The National Credit Union has Rs250, 000 available to invest in a 12-month commitment. The money can be placed in Treasury notes yielding an 8% return or in municipal bonds at an average rate of return of 9%. Credit union regulations require diversification to the extent that at least 50% of the investment be placed in Treasury notes. Because of defaults in such municipalities as Cleveland and New York, it is decided that no more than 40% of the investment be placed in bonds. How much should the National Credit Union invest in each security so as to maximize its return on investment?

Q.2. Write short notes on all of the following topics (1 mark each - Word limit - 100)

A. Inventory Models: Deterministic Models.

B. CPM AND PERT: Network Representation

C. Introduction

D. Quantity discount Model

E. Queuing Discipline