

- 7 Briefly explain about steps in designing single factor experimentation. (07 Marks)

SECTION - C

Note : Answer any FOUR questions from Q.No.1 to Q.No.7.

- 1 A company produces 2 types of hats. Each hat of the first type requires three as much labour time as the second type. If all hats are of second type only, the company can produce a total of 500 hats a day. The market limits daily sales of the first and second type to 150 and 250 hats. Assuming that the profit per hat are Rs. 8/- for type A and Rs. 5/- for type B, formulate the problem as LP model in order to determine the number of hats to be produced of each type so as to maximize the profit. Solve graphically. (10 Marks)

- 2 A small project consisting of the following jobs whose time estimates are given below:

Job	1-2	1-3	2-3	2-5	3-4	3-6	4-5	4-6	5-6	6-7
Time (days)	15	15	3	5	8	12	1	14	3	14

- (i) Draw a network diagram.
 (ii) Find the critical path and project duration. (10 Marks)
- 3 Four professors of each of capable of any one of 4 different subjects. Class preparation time (in hours) for different topics varies from professor to professor and is given in the table. Each professor should be assigned only one subject. Find the schedule so as to minimize the total subject preparation time/ professor. (10 Marks)

		Subjects			
		S ₁	S ₂	S ₃	S ₄
Professors	P ₁	2	10	9	7
	P ₂	15	4	14	8
	P ₃	13	14	16	11
	P ₄	3	15	13	8

- 4 The following table shows the jobs of a network along with their time estimates: (10 Marks)

Job	1-2	1-6	2-3	2-4	3-5	4-5	6-7	5-8	7-8
t _o	1	2	2	2	7	5	5	3	8
t _m	7	5	14	5	10	5	8	3	17
t _p	13	14	26	8	19	17	29	9	32

Draw the project network and find the probability of the project completing in 40 days. (Take $\phi(0.8) = 0.2881$)

- 5 Obtain the rank correlation coefficient between the variables X and Y from the following pairs of observed values: (10 Marks)

X	50	55	65	50	55	60	50	65	70	75
Y	110	110	115	125	140	115	130	120	115	160

- 6 Explain briefly about decision making under risk and decision trees. (10 Marks)

- 7 The life time of a certain electrical equipment has the normal distribution with mean 80 hours and standard deviation 16 hours:

- (i) What is the probability that the equipment lasts at least 100 hours?
 (ii) If the equipment has already lasted 88 hours, what is the conditional probability that it will last at least another 12 hours? (10 Marks)