Paper Code: 4629

Semester VI
Subject: Statistics Paper: ST – 605
[Operations Research – II]
April 2016

Time: $2\frac{1}{2}$ Hours
Marks: (70)

Instructions:

1. All questions are compulsory.
2. Each question carries (14) marks.
3. Statistical tables will be provided on request.
4. Use of scientific calculator is allowed.

Q. 1 (a) What is inventory control? State its importance with respect to economic aspect. 6

(b) ABC Ltd. is engaged in sale of footballs. Its cost per order is Rs. 400 and its carrying cost unit is Rs. 10 per unit per annum. The company has a demand for 20,000 units per year. Calculate the order size, total orders required during a year, total carrying cost and total ordering cost for the year. 8

OR

Q. 1 (a) Derive, in usual notations, classical EOQ model 7

(b) In EOQ model, if shortages are allowed, derive the expression for annual holding cost. 7

Q. 2 (a) Derive EOQ model under price breaks. 8

(b) Describe different cost associated with inventory problems. 6

OR

Q. 2 (a) Describe different cost associated with inventory problems. Derive the formula for economic order quantity Q*. 6

(b) P.Soni is a dealer of Qu TV sets. It has observed that the annual demand is about 768 sets and that the annual cost og holding TV sets in stock is R. 30. The order placed for the sets costs Rs. 20. Using this information, find optimum order quantity, total variable cost involved in ordering the optimum quantity 8

Q. 3 (a) What is simulation? Describe the simulation process. 5

(b) An ice-cream parlour's record of previous month's sale of a particular variety of ice cream as shown in following table. 9

Demand (No. of Ice-creams)	4	5	6	7	8
No. of days	6	10	5	3	8

Simulate the demand for first 7 days of the month.

OR

Q. 3 (a) Explain Dynamic programming. State the chief characteristics of dynamic programming. 9

(b) State the bellman's principle of optimality. 5

Q. 4 (a) Derive General Recursion Equation to find the shortest distance between City -A to City- G using the following information- 8

						E	F			G
	B	C	D		B	8	-		E	7
A	5	7	6		C	3	5		F	9
					D	-	6			

Find the shortest route so that the total travelling distance is minimum.

(b) Explain the following concepts of Dynamic programming- 6

i) Stage,

ii) State, and

iii) Return Function.

OR

Q. 4 (a) State full form of PERT and CPM and distinguish them. 8

(b) Define following terms with respect to PERT CPM 6

(i) Activity,

(ii) Event,

(iii) Dummy Activity,

(iv) Earliest Start time,

(v) Latest finish time,

(vi) Float time of an event

Q. 5 (a) State the advantages of CPM. 6

(b) A project schedule is given as under 8

Activity	1-2	2-3	2-4	3-5	3-6	4-6	4-7	5-8	6-8	7-8
Time	15	6	6	6	18	15	18	27	6	9

Find (i) EST, (ii) EFT, (iii) LST, (iv) LFT

OR

Q. 5 (a) State the rules of network construction. 6

(b) Determine expected time and variance for the following project. 8

Activity	A	B	C	D	E	F	G	H	I
Optimistic time	14	40	56	36	34	16	18	18	10
Most likely time	24	48	84	44	54	28	28	22	4
Pessimistic time	20	44	60	40	44	22	24	20	12

Deterrmine the Critical path and expected duration of project.