~~24/8/2016~~
23/8/2016

DOON UNIVERSITY, DEHRADUN
Semester final Examination, even Semester, 2016
School of social science
M.Sc. (Economics) 8th Sem
Course: SSEI-Operation Resaerch
523

Time Allowed: 3Hours *Maximum Marks: 50*

1. Consider a problem of assigning four clerk to four to four tasks. The time (hours) required to complete the task is given below.

	Tasks				
Clerks		A	B	C	D
	1	4	7	5	6
	2	-	8	7	4
	3	3	-	5	3
	4	6	6	4	2

Clerk 2 cannot be assigning task a and clerk 3 cannot be assigned task B find all the optimum assignment schedules. 5 marks
Ans- min hrs- 18

Or:-
How is the concept of dominance used in simplifying the solution of rectangular games? (5 marks)

2. Solve the game whose payoff matrix is given below:

	Player B			
Player A	B1	B2	B3	B4
A1	3	2	4	0
A2	3	4	2	4
A3	4	2	4	0
A4	0	4	0	8

8 marks

Ans expected gain of A= 8/3 and B= 8/3
Or
Explain the deterministic inventory system and inventory cost component. (8 marks)

3. A dealer supplies you the following information with regards to product that he deals in.

Annual demand = 10000 units, ordering cost= rs. 10/ order, price= rs 20/ unit, inventory carrying cost= 20 % of thevalue of inventory per year. The dealer is considered the possibility of allowing some back order to occur. He as estimated that the annual cost of back ordering will be 25% of the value of inventory.

a) What should be the optimum number of unit of product he should buy in one lot.
b) What quantity of product should be allowed to be back ordered, if any?
c) What would be the maximum quantity of inventory at any time of the year?
d) Would you recommend to allow backordering? If so, what would be the annual cost saving by adopting the policy of backordering.

(8 marks)

Or

Make a comparison between Q system and P system of the deterministic inventory model with proper example.

4. Write a short notes
   a) Probabilistic model
   b) Hungarian method of assignment. (5 marks)

   Or

A manufacturer has to supply his customer with 600 units of his product per year. Shortage are not allowed and the storage cost amounts to rs .60 per unit per year. The set up cost per run is rs. 80. Find the optimum run size and the minimum average yearly cost. (5 marks)

5. The data collected on the running a machine, the cost of which is rs. 60,000 are given below

Year	1	2	3	4	5
Resale value Rs.	42000	30000	20,400	14,400	9,650
Cost of spares	4000	4,270	4,880	5,700	6,800
Cost of labour	14000	16000	18000	21000	25000

Determine the optimum period of replacement of macine. (4 marks)

Or

Explain the state and transition probabilities in Markov Model (4 marks)

6. The following table illustrates the flow of customers over an observation period of one month.

dairy	June 1	Gain From			Loss To			July 1
	customer	A	B	C	A	B	C	Customer
A	200	0	35	25	0	20	20	220
B	500	20	0	20	35	0	15	490
C	300	20	15	0	25	20	0	290

We assume that the matrix of transition probabilities remain fairly stable and that the july 1 market shares are A= 22%, B= 49%, C= 29%. Managers of these dairy are willing to know

A) Market shares of their dairies on 1st august and 1st September.

B) The market shares in steady state. (10 marks)

Or

Explain followings

A) Advantage and limitation of simulation models.
B) Application area of Monte Carlo Simulation. (10 marks)

7. Two person X and Y works on a two station assembly line. The distribution of activity at their satiation are

Time (in seconds)	Time frequency for X	Time frequency for Y
10	4	2
20	7	3
30	10	6
40	15	8
50	35	12
60	18	9
70	8	7
80	3	3

A) Simulate the operation of the line of eight items
B) Assuming y must wait until X completes the first item before starting work, will has to wait to process any of the other seven items. What is the average waiting time of items. Use the following random numbers

For X	83	70	6	12	59	46	54	04
For Y	51	99	84	81	15	36	12	54

c) Determine the inventory of items between the two stations.
d) What is the average production rate. (10 marks)

OR

Write down the followings:-

A) Group replacement policy
B) Rules to determine the saddle point. (10 marks)