Master of Arts Examination 2017
(2nd year 3rd semester)
Economics
Operations Research

Time: 2 Hours   Full Marks: 30

Answer any three questions: 3X10

1) Describe how the order size is determined in EOQ model with finite replenishment rate when the shortages are allowed.

2) For multiple item inventory, following information are provided

Item	Cost price(Rs)	demand
1	30	3000
2	20	2000
3	25	4000

The order cost is Rs 10 and carrying cost is 15%,

a) What is the optimal ordering policy?   4

b) If the total order size has to be kept at a level 60 orders per year, what should be the total cost for optimal policy?   4

c) How much higher it is from the actual optimal total cost?
                                                                        2

3) Find the shortest distance to node 3 from all other nodes from the following diagram.

                                                                        2
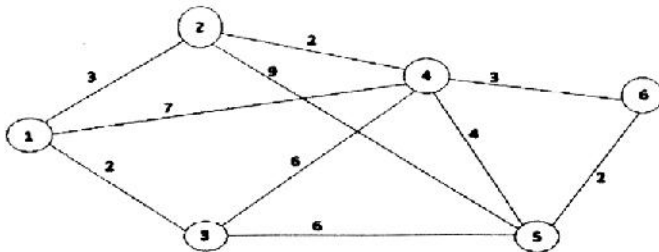
4) Answer any 4 question: 4 x 2.5

a) Give the definition of Inventory. When an inventory problem called a static problem?

b) Find the nearest neighbours for the nodes 1, 2, 3, 5 and 6 from the diagram at question 3.

c) What are tree and spanning tree in a network?

d) Define path and directed path for a network.

e) Differentiate between ergodic and regular Markov chains.

f) Given the one-step transition probability matrix

[Turn over

P=

	A	B	C	D	E	
	0.3	0	0.2	0.1	0.4	A
	0.1	0.2	0	0.6	0.1	B
	0.3	0	0.5	0.1	0.1	C
	0	0.1	0.3	0.2	0.4	D
	0	0.2	0	0	0.8	E

Find out the probability that the process starting from state A attend the state E after two moves and state B after three moves.

5) If, for a Markov chain, the one-step transition probability matrix is given as:

P=

	A	B	C	D	E	
	0.4	0	0.2	0	0.4	A
	0	1	0	0	0	B
	0.3	0	0.2	0.1	0.4	C
	0	0	0	1	0	D
	0	0	0	0	1	E

a) Find whether the chain is absorbing or not.   1
b) Enumerate the transient states.   1
c) Represent the chain with weighted digraph.   3
d) Get the time to absorption if the chain absorbing and starts from state A or from state C.   2
e) If the chain absorbing get the absorption probabilities from state A to state E and state C to
   state B.   3