Roll No .....

ME - 705

B.E. VII Semester

Examination, December 2013

Operations Research & Supply Chain

Time : Three Hours

Maximum Marks : 70

Note : *Attempt all questions.*

Assume data suitably if necessary.

1. a) Explain the feasibility and optimality conditions in a LPP. 4

   b) Solve the following LPP using simplex method. 10

   maximize $Z = 3x_1 + 8x_2$

   Subjected to $3x_1 + 4x_2 \leq 18$

   $3x_1 + 5x_2 \leq 21$

   Where $x_1 , x_2 \geq 0$

OR

2. a) Explain the difference between a transportation and an assignment problem. 4

   b) Determine the IBFS for the following transportation problem using the NWC method and VAM and Compare the transportation cost. 10

	Markets A	B	C	D	Supply
Warehouses	6	3	5	4	22
	5	9	2	7	15
	5	7	8	6	8
Demand	7	12	17	9	

3. a) Explain the various decision phases in supply chain. 7

   b) Describe the cyclic view and push/pull view of supply chain process. 7

OR

4. a) Explain the procedure involved in developing strategy for purchasing. 7

   b) Describe the factors that will be considered for evaluating and selecting suppliers. 7

5. a) Write down the necessity of maintaining the inventory. List down the various causes of poor inventory control. 7

   b) Derive an expression to determine the EOQ. 7

OR

6. a) The demand for a commodity is 100 units per day. Every time an order is placed, a fixed cost of Rs.400 is incurred. Holding cost is Rs. 0.08 per unit per day. If the lead time is 13 days, determine the economic lot size and the recorder point. 7

   b) The following information is known about a group of item. Classify the items as A, B and C. 7

Item No.	Annual Consumption in pieces	Unit Price in paise
501	30,000	10
502	2,80,000	15
503	3,000	10
504	1,10,000	5
505	4000	5
506	2,20,000	10
507	15,000	5
508	,80,000	5
509	60,000	15
510	8,000	10

7. a) What do you understand by Queuing model? Explain the Kendall notation. 6

   b) A self service store employs one cashier at its counter. Nine customers arrive on an average every 5 minutes while the cashier can serve 10 customers in 5 minutes. Assuming poisson distribution for arrival rate and exponential distribution for service rate find 8

   i) Average no. of customer in the system

   ii) Average no. of customer in queue

   iii) Average time a customer spends in the system

   iv) Average time a customer waits before being served.

OR

8. a) What is competitive games. Discuss various terms associated with it. 7

   b) Two airlines operate the same air route, both trying to get as large a market as possible. Based on a certain market, daily gains and losses in rupees are shown below in which positive values favour airlines A and negative values favour airline B. Find the solution for game. 7

		Air lines B: Does nothing	Advertiser special rates	Advertiser special features (i.e. movies, fine foods)
Airline A	Advertiser special rates	275	−50	−75
	Advertiser special features (i.e. movies, fine food)	125	130	150

9. a) What do you understand by decision? Explain the various types of decision in an industry. 7

   b) Explain the travelling salesman problem with an example. 7

OR

10. Write down short notes on any two of the following 14

   a) Hurwicz criteria of decision analysis

   b) Genetic Algorithms

   c) Non linear optimization problems.

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