Exam Date & Time: 10-Jan-2024 (02:30 PM - 05:30 PM)

MANIPAL ACADEMY OF HIGHER EDUCATION

VII SEMESTER B.TECH END SEMESTER MAKE UP EXAMINATIONS, JAN 2024

Supply Chain Management [MME 4086]

Marks: 50   **Duration: 180 mins.**

<div align="center">A</div>

Answer all the questions.

Instructions to Candidates: Answer ALL questions Missing data may be suitably assumed

1)   For the data of a project given below,

A)

Activity	Predecessor Activity	Duration (Weeks)
A	-	15
B	A	17
C	A	21
D	B	19
E	B	22
F	C, D	18
G	E, F	15

(5)

        i. Draw the project network diagram

        ii. Find the critical path

        iii. Find the Early start/finish and late start/finish. Also, determine the slack/float for each activities.

B)   Identify the various components involved in the supply chain management and briefly explain the same.   (3)

C)   Briefly explain about the push and pull strategy used in supply chain management.   (2)

2)   Trucking company serves two segments of customers. One segment (A) is willing to pay (4) $3.50 per cubic foot but wants to commit to a shipment with only 24 hours notice. The other segment (B) is willing to pay only $2.00 per cubic foot and is willing to commit to

A)   a shipment with up to one-week notice. With two weeks to go, demand for segment A is forecast to be normally distributed, with a mean of 3,000 cubic feet and a standard deviation of 1,000.

i)How much of the available capacity should be reserved for segment A?

ii)How should change its decision if segment A is willing to pay $5 per cubic foot?

B)   The first batch of new product has just been made. The batch size was 20 units and the total time taken was 200 hours- i.e. an average of 10 hours per unit. A 90 percent learning curve is expected to apply. Determine the following

i)Cumulative average time for the first two batches

(3)

ii)Total time to produce 40 units

iii)Incremental time for 41 to 60 units-i.e. third batch of 20 units.

C)   Briefly explain about the reasons for carrying the inventory.

(3)

3)   ABC Ltd. uses EOQ logic to determine the order quantity for its various components and is planning its orders. The Annual consumption is 80,000 units, Cost to place one order is Rs. 1,200, Cost per unit is Rs. 50 and carrying cost is 6% of Unit cost.

A)   Find EOQ, No. of order per year, Ordering Cost and Carrying Cost and Total Cost of Inventory.

(4)

B)   Describe the safety inventory policy with an example.

(3)

C)   Describe the various factors influencing network design decision.

(3)

4)   A larger and more modern main port office is to be constructed at a new location due to the shifting pattern of population density. Seven main source points have been identified from where main is picked up and delivered in bulk. The coordinates and trips per day to and from the seven main source points and the current main port office 'M' are shown in the following table. M will continue to act as a main source point after relocation.

(4)

A)

Calculate load distance scores for the location using rectilinear distance

Source Point	Round trips per day	X, Y-coordinates (miles)
1	6	(2,8)
2	3	(6,1)
3	3	(8,5)
4	3	(13,3)
5	2	(15,10)
6	7	(6,14)
7	5	(18,1)
M	3	(10,3)

B)   Briefly explain about the role of transportation is supply chain management.

(3)

C)   With the sketch, describe the following transposition designs

i)Direct Shipment with milk runs

(3)

ii)Shipment via distribution centre with milk runs.

5)   For the given data of transportation cost (in Rs) between various source and destination, find the initial basic feasible solution by Least Cost Method.

A)

Source \ To	D	E	F	Supply
A	5	8	4	50
B	6	6	3	40
C	3	9	6	60
Demand	20	95	35	150

(4)

B)   Describe the discounted cash flow analysis.

(3)

C)   Interpret the various types of inventory costs and explain the same.

(3)

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