

BIRLA INSTITUTE OF TECHNOLOGY & SCIENCE, PILANI

FIRST SEMESTER- 2022-2023

SUPPLY CHAIN ANALYTICS

Mid Term Exam (Closed Book)

Max. Marks: 30

Date: 04/11/22

Time: 90 Min

Q.1 Hero purchases components from three suppliers. The price charged and usage rate of components of three suppliers are given below: **[10 marks]**

Supplier	Price	Usage rate per month
Precision	Rs 500	20,000
Desno	Rs 400	2500
Delphi	Rs 500	900

Currently Hero purchases a separate truckload from each supplier. As part of JIT drive, Hero has decided to aggregate purchases from three suppliers. The trucking company charges a fixed cost of Rs 4000 and additional charge of Rs 1000 for each stop. Thus if Hero asks for a pick up from one supplier, it charges Rs 5000; from two suppliers it charges Rs 6000 and from three suppliers, it charges Rs 7000.

Suggest a replenishment strategy for Hero that minimizes the total cost annual cost. Compare the cost of your strategy with Hero's current strategy.

Q.2 ITC has four plants in India at Baddi, Calcutta, Indore and Bangalore. It distributes it's one of the product- Aashirwaad Floor to across India. The company stocks inventory in own warehouses at five location Viz. Delhi, Calcutta, Chennai, Mumbai and Bhopal. ITC Logistics head want to optimize the distribution network. You are required to provide him problem formulation in three following situations.

Any plant can ship to any market

[3 Marks]

Only one Plant ship to one market

[3 Marks]

Q.3 Monthly demand at Felxonotrics for one of equipment of TVs are as follows:

Month - Demand(Units)

1-100; 2-1113; 3- 1271; 4-1445; 5 -1558; 6- 1648; 7- 1724; 8- 1850; 9- 1864; 10-2076

11- 2167; 12- 2191

Estimate the demand for the next two months using simple exponential smoothing with $\alpha = 0.3$ and Holt's model with $\alpha = 0.05$ and $\beta = 0.1$ (For Holt's model use $L_0 = 948$ and $T_0 = 109$, both are obtained using regression model for given data). **[4+6=10 Marks]**

Q.4 Take the example of Flipkart and Big Bazar supply chain. Highlight the decoupling point in these two supply chains. Which supply chain is riskier and why? What supply chain strategy do you suggest for these two companies. **[4 Marks]**