JAIPURIA INSTITUTE OF MANAGEMENT
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JAIPURIA INSTITUTE OF MANAGEMENT, NOIDA

PGDM / PGDM (M) / PGDM (SM)

SECOND TRIMESTER (Batch 2022-24)

END TERM EXAMINATIONS, JANUARY 2023

SET-2

Course Name	Operations Management	Course Code	20502
Max. Time	2 Hours	Max. Marks	40 MM

INSTRUCTIONS:

- This is a Closed Book examination.
- Attempt all four questions.
- Only Scientific Calculators allowed for calculations
- Answers should be rich in content, pointwise and precise. Avoid unnecessary long answers.

Q1)

The Roxkind Rifle Company wants to monitor the quality of rifles it manufactures. Each day the company's Quality Control Manager takes a sample of 100 rifles, tests them and determines the number of defective rifles. The results of the 20 samples have been recorded as follows:

Sample	Number of Defectives	Sample	Number of Defectives
1	13	11	21
2	11	12	11
3	12	13	17
4	11	14	22
5	9	15	18
6	6	16	16
7	8	17	18
8	12	18	24
9	15	19	27
10	17	20	28

a) Construct a p-chart for this process using 2σ limits.
b) Examine and predict whether the rifle manufacturing process is in control or not.
c) Roxkind Rifle Company is a defense contractor and supplies rifles for military. The company is experiencing extremely high quality related costs. Speculate and discuss various quality related costs that the company might be incurring.

(Marks 4 + 2 + 4 = 10)

Q2)

The Goodstone Tire Company produces a brand of tire called the Rainpath. The annual demand at its distribution center is 12400 tires per year. The fixed transport and handling costs are $2600 each time shipment of tires is ordered at the distribution center. The annual carrying costs is $3.75 per tire.

a) Determine the optimal order quantity.
b) Determine the minimum total annual inventory related costs.
c) The company is thinking of relocating its distribution center which would reduce transport and handling costs to $1900 per order but increase inventory carrying costs to $4.5 per tire per year. Examine and recommend whether the company should relocate its distribution center if the decision is based solely on inventory related costs.

(Marks 2 + 4 + 4 = 10)

Q3)

The Manager at Excom Service Station wants to forecast the demand for unleaded gasoline next month so that suitable number of gallons can be ordered from the distributor. Manager has accumulated the following data for unleaded gasoline sales during last 10 months

Month	Gasoline Demand (gallon)
October	800
November	725
December	630
January	500
February	645
March	690
April	730
May	810
June	1200
July	980

a) Using weights of 30% for the May sales data, 30% for June sales data and 40% for July sales data, compute a three-month weighted moving average forecast for August.
b) Determine an exponentially smoothed forecast for the month of August using value of alpha of 0.30.
c) The owner of the Excom Service Station plans to open another service station in the neighboring city after getting required statutory approvals. Examine various factors, the owner needs to take into account in selecting the most appropriate location for the upcoming service center.

(Marks 2 + 4 + 4 = 10)

Q4)

a) What are the objectives of Facility Layout? Discuss how Cycle Time and Theoretical minimum number of workstations are calculated in assembly line balancing.
b) Discuss and differentiate between competitive priorities and capabilities of operations. Give one example each of manufacturing or service firm that successfully compete on each of the following criterion i) Quality ii) Speed iii) Flexibility iv) Innovation v) Cost Efficiency.

(Marks 5 + 5 = 10)