Institute of Management Technology
Centre for Distance Learning, Ghaziabad
Recognised by University Grants Commission

IMT-15

PRODUCTION AND OPERATIONS MANAGEMENT

Notes:
   a. Write answers in your own words as far as possible and refrain from copying from the text books/handouts.
   b. Answers of Ist Set (Part-A), IInd Set (Part-B), IIIrd Set (Part – C) and Set-IVth (Case Study) must be sent together.
   c. Submit the assignments in IMT CDL H.O. along with the assignments Question Papers for evaluation .
   d. Only hand written assignments shall be accepted.

A. First Set of Assignments	5 Questions, each question carries 1.5 marks.
B. Second Set of Assignments	5 Questions, each question carries 1.5 marks.
C. Third Set of Assignments	5 Questions, each question carries 1.5 marks. Confine your answers to 150 to 200 Words.
D. Forth Set of Assignments	Two Case Studies : 7.5 Marks. Each case study carries 3.75 marks.

SECTION - A

1. What is operations management? Describe the different typical measures for quality, speed of delivery and flexibility.

2. Neotech Corporation is considering adding a new feature that will increase unit sales by 7.5% and product cost by 13%. The profit is expected to increase by 23% of the increased sales. Initially the product cost incurred by the company was 54% of the sales price. Should the new feature be added by the company?

3. Amit drives his own car on company business. His employer reimburses him for such travel at the rate of Rs. 8.50 per km. Amit estimates that his fixed costs per year such as taxes, insurance and depreciation are Rs. 25000. The direct or variable costs such as gas, oil and maintenance average about Rs. 2.40 per km. How many km must he drive to break even?

4. A small manufacturing facility is being planned that will feed parts to three heavy manufacturing facilities. The locations of the current plants with their coordinates and volume requirements are given in the following table:

PLANT LOCATION	COORDINATES (x,y)	VOLUME (PARTS PER YEAR)
Peoria	300, 320	4,000
Decatur	375, 470	6,000
Joliet	470, 180	3,000

Use the centroid method to determine the best location for this new facility.

5. What are the qualitative techniques used in forecasting?

SECTION - B

1. A firm's sales for a product line during the 12 quarters of the past three years were as follows:

Quarter	1	2	3	4	5	6	7	8	9	10	11	12
Sales	600	1550	1500	1500	2400	3100	2600	2900	3800	4500	4000	4900

Forecast sales of each quarter of the fourth year i.e. quarters 13, 14, 15 and 16.

2. What is the major difference between aggregate planning in manufacturing and aggregate planning in service?

3. Madan Mathur is the supervisor of Legal Cop-Express, which provides copy services for downtown Los Angeles law firms. Five customers submitted their orders at the beginning of the week. Specific scheduling data are as follows:

Job (In order of arrival)	Processing time (Days)	Due Date (Days Hence)
A	3	5
B	4	6
C	2	7
D	6	9
E	1	2

All orders require the use of the only color copy machine available. Mr. Mathur must decide on the processing sequence for the five orders. The evaluation criterion is minimum flow time. Suppose that Mathur decides to use the FCFS rule in an attempt to make Legal Copy-Express appear fair to its customers.

4. What is the role of safety stock in an MRP system? "MRP just prepares shopping lists. It does not do the shopping or cook the dinner." Comment.

5. Items purchased from a vendor cost Rs.20 each and the forecast for next year demand is 1000 units. If it costs Rs.5 every time an order is placed for more units and the storage cost is Rs.4 per unit per year. Find that
    a. What quantity should be ordered each time?
    b. What is the total ordering cost for a year?
    c. What is the total storage cost for a year?

SECTION - C

1. "You don't inspect quality into a product; you have to build it in." Discuss the implications of this statement.
2. A & B company has yearly demand for one of its products as follows

Year	2001	2002	2003	2004	2005	2006	2007	2008
Demand	710	660	720	780	730	690	750	770

Develop a three-period moving average forecast and a three-period weighted moving average forecast with weights of 0.50, 0.35 and 0.15 for the most recent demand values, in that order. Calculate mean absolute deviation for each forecast and indicate which would seem to be most accurate.

3. Discuss the purpose of and differences between p charts and R charts.
4. What is meant by PMT and MRO? How MRO performs is different functions for maintenance and repairs?
5. Describe the concepts of competitive priorities, competitive capabilities, order winners and order qualifiers.

CASE STUDY - 1

Ten samples of 15 parts each were taken from an ongoing process to establish a *p chart* for control. The samples and the number of defectives in each are shown in the following table:

Sample	n	Number of Defects in Sample	Sample	n	Number of Defects in Sample
1	15	3	6	15	2
2	15	1	7	15	0
3	15	0	8	15	3
4	15	0	9	15	1
5	15	0	10	15	0

    a.   Develop a *p chart* for 95 percent confidence (1.96 standard deviations).

    b.   Based on the plotted data points, what comments can you make?

CASE STUDY - 2

The R & D department is planning to bid on a large project for the development of a new communication system for commercial planes. The accompanying table shows the activities, times and sequences require:

Activity	Immediate Predecessor	Time (Weeks)
A	--	3
B	A	2
C	A	4
D	A	4
E	B	6
F	C, D	6
G	D, F	2
H	D	3
I	E, G, H	3

a. Draw the network diagram.
b. What is the critical path?
c. Suppose you want to shorten completion time as much as possible and you have the option of shortening any or all of B, C, D and G each one week. Which would you shorten?
d. What is the new critical path and earliest completion time?