

[This question paper contains 4 printed pages.]

**Sr. No. of Question Paper : 1400**

**F-7**

**Your Roll No.....**

Unique Paper Code : 1091501

Name of the Paper : Operations Management

Name of the Course : **BMS (FYUP)**

Semester : V

Duration : 3 Hours

Maximum Marks : 75

**Instructions for Candidates**

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Attempt 5 questions in all.
3. All questions carry equal marks.
4. Attempt all parts of a question together. Show your workings clearly.
5. Use of Simple Calculator is allowed.

1. (a) What is the role of Operations Management (OM) in an Organisation ?  
Discuss the key managerial decisions involved in the area of OM. (7)
- (b) Demand for a product (in '00 units) is 90 for the month of April, 93 for May, 107 for June, 114 for July, 106 for August and 130 for September. The forecast for the month of April was 100. With a smoothing coefficient of 0.2 ( $\alpha=0.2$ ) and using first order exponential smoothing, Forecast the demand for the month of October. Calculate MAD and comment on the forecast accuracy. (8)
2. (a) A company dealing in copper cable operates for 50 weeks in a year. The cable costs Rs. 240 per meter and there is a demand for 8,000 meters in a

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week. Each order costs the administration Rs. 2,700. The holding cost is 25% of the unit cost. Assuming shortages are allowed, what is the Economic order quantity ? Also, calculate the optimal number of orders in the year, the total variable cost and total optimal cost. (7)

- (b) Find the sequence that minimises the total elapsed time to complete the following tasks on two machines X and Y, in the order XY. Also, find the idle time on both the machines. (8)

Task	A	B	C	D	E
Machine X (Time in hours)	5	1	9	3	10
Machine Y (Time in hours)	2	6	7	8	4

3. (a) Distinguish between Process and Product layout in terms their volume, variety and flow characteristics. Discuss the advantages and limitations of both the layouts. (7)
- (b) The following tasks must be performed on Assembly line in the sequence and time for each activity : (8)

Task	A	B	C	D	E	F	G	H
Time (in mins)	5	3	4	3	6	1	4	2
Precedence	-	A	B	B	C	C	D,E,F	G

- (i) Draw the precedence diagram.
- (ii) Determine the cycle time.
- (iii) What is the theoretical minimum number of workstations required to meet a forecast demand of 60 units in an eight hour day ?
- (iv) Use LOT rule to balance the line in the minimum number of workstations and calculate the efficiency of the line.

4. (a) A Television repairman finds that the time spent on his repair jobs has an Exponential distribution with a mean 2 T.V. sets per hour. If he repairs the T.V. sets in the order of their arrival and the arrivals follow Poisson distribution with a mean arrival rate of 10 T.V. sets in an 8 hour working day, what is the arrival rate of T.V. sets per hour ? Also find the repairman's idle time each day and the expected number of T.V. sets in the system. (7)
- (b) A factory is facing severe backlog of orders and the management is considering the following courses of action :

**Course of Action (Profit/Loss in Rs lakhs)**

Demand	Probability	S <sub>1</sub> Subcontract	S <sub>2</sub> Overtime	S <sub>3</sub> New facility
Low	0.1	10	-20	-150
Medium	0.5	50	60	20
High	0.4	50	100	200

Draw a Decision tree and indicate the optimal decision and its expected value. (8)

5. (a) A Company supplies office products; it draws 10 samples of size 100 to judge the quality of products. The data of samples is given below :

Sample	1	2	3	4	5	6	7	8	9	10
Defectives	5	7	4	4	6	3	5	6	2	8

Establish the upper and lower control limits for c-chart and graph the data. Is the process in control ? (7)

- (b) Following are demand estimates for 6 months of a Furniture Mart :

Month	July	August	September	October	November	December
Demand	1000	1200	1400	1800	1800	1600

1400

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Assuming zero opening and closing inventory, evaluate the cost of the plan to produce 1000 units per month at the cost of Rs. 580 per unit and subcontract additional units at the rate of Rs. 600 per unit. (8)

6. Write short notes : (Do any three)

(a) Acceptance sampling

(b) Bathtub Curve

(c) Factors that affect location of a Fast Food chain

(d) Lean management

(3×5)