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M.Tech (ME) (2017 Batch) (Sem.–1)

OPERATIONS MANAGEMENT

Subject Code : MTME-104

Paper ID : 74718

Time : 3 Hrs. Max. Marks : 100

INSTRUCTIONS TO CANDIDATES :

1. Attempt any FIVE questions out of EIGHT questions.
2. Each question carries TWENTY marks.

1. a) Distinguish between mass and batch type manufacturing systems on the basis of various parameters. (10)

   b) What is long range planning? Discuss its advantages and limitations. (10)

2. a) Distinguish between semi average and moving average methods of forecasting and explain it with one numerical example. (10)

   b) Derive the expression for the new forecast (F_0) for exponential smoothing method with defining all the terms. (10)

3. The demand for a product in last 10 years is given below. Forecast the demand for the next year by simple average method and 3-yearly moving average method and compute the MAD, Bias, MAPE and Standard deviation from 5^{th} to 11^{th} years. (20)

Year	1	2	3	4	5	6	7	8	9	10
Units	60	83	89	112	125	136	133	162	172	195

4. a) What do you understand by 'market survey' method of sales forecasting? Explain various techniques to conduct it. (10)

   b) A company requires 16,000 units of raw material; costing Rs.2/- per unit. The cost of placing an order is Rs. 45/- and the carrying costs are 10% per year per unit of average inventory. Determine : (a) The economic order quantity (b) Cycle time (c) Total variable cost of managing the inventory. (10)

5. a) Derive the EOQ for the inventory model-II with neat sketch by considering the gradual stock replenishment. Write all the assumptions also. (10)

   b) Define Plant layout. Write the advantages and limitations of industries located in urban and rural areas. (10)

6. Explain the Materials requirement planning with its inputs, outputs, advantages, and limitations (20)

7. A bomb squad faces the following situation. A terrorist has planted 5 bombs in airport building endangering lives and property. The squad has located all five bombs and must now proceed to dismantle them. Because of limited staffing, the bombs can be dismantled sequentially. Unfortunately, there is not much time left, and squad must choose judiciously the order in which bombs will be dismantled. The following data represents a reliable estimate by the squad :

Bombs	**1**	**2**	**3**	**4**	**5**
Time to dismantle (in Hours)	3	1	2	4	1
Time remaining before the bomb will explode (in Hours)	9	11.25	11	6	5

a) Which sequence for dismantling the bombs would you recommend to the squad?

b) What should be the criterion that the squad must optimize? (20)

8. Write the short notes on the following :

a) Principles of materials flow. (6)

b) JIT-II. (7)

c) Manufacturing resource planning. (7)