Total No. of printed pages = 3

ME 181703

Roll No. of candidate

3/3/22   **2021**

B.Tech. 7th Semester End-Term Examination

ME

INDUSTRIAL ENGINEERING AND MANAGEMENT

(New Regulation w.e.f. 2017-18 & New Syllabus w.e.f. 2018-19)

Full Marks – 70   Time – Three hours

The figures in the margin indicate full marks for the questions.

(Answer question No. 1 and any *five* from the rest questions)

1. Write short answers (any *four*): $(4 \times 5 = 20)$

    (a) Lean manufacturing

    (b) MRP-II

    (c) 7 wastes in production

    (d) ISO 9000

    (e) 5S

2. The table below gives the information about the existing facilities for a beverage company. The company wishes to start a new plant with the same existing facilities. Determine the location of the new plant focusing on the transportation cost using Simple Median Method.   (10)

Location of facilities	Coordinate location	Cost of moving one unit by unit distance	Annual load
Bareilly	(10,80)	10	452
Shahjahanpur	(30,60)	10	678
Gonda	(80,50)	10	483
Kanpur	(50,10)	10	711
Sultanpur	(80,10)	10	539

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3. The management of an industry plans to reduce the inventory in stock. The table below shows the list of different items along with the prices. As a manager estimate A class, B class and C class items and suggest which items needs to be given priority. (10)

Item	Price in Rs.	Item	Price in Rs.
1	100	11	170
2	2000	12	30
3	525	13	70
4	130	14	150
5	160	15	110
6	90	16	230
7	1050	17	25
8	175	18	20
9	35	19	30
10	40	20	90

4. Design an organisational structure for an institute imparting technical education. (10)

5. ABC corporation has got a demand for a particular product of 10,000 units per year. The cost per unit is Rs. 2 and it costs Rs. 36 to place an order and to process the delivery. The inventory carrying cost is estimated at 9 % of average inventory investment. Determine

   (a) Economic order quantity

   (b) Optimum no. of orders to be placed per annum

   (c) Minimum total cost of inventory per annum. (10)

6. The PERT time estimates of a project are given below. Construct the PERT Network and find the critical path and variance of each event. Find the project duration at 95% probability. Value of Z=1.65 at 95% probability. (10)

Activity	Optimistic time	Most likely time	Pessimistic time
1-2	1	5	1.5
2-3	1	3	2
2-4	1	5	3
3-5	3	5	4
4-5	2	4	3
4-6	3	7	5
5-7	4	6	5
6-7	6	8	7
7-8	2	6	4
7-9	5	8	6
8-10	1	3	2
9-10	3	7	3

7. Draw two-handed process chart for assembling of ceiling fan. (10)

8. A manufacturer of an electronic control system (ECS) for musical appliances uses a NDT mechanism to assess the quality of ECS. A lot of 100 ECSes is drawn periodically for testing. After testing, the ECSes will be classified as either defective or good depending on the outcome of the test. Table below gives the no. of defects for 12 such samples. Establish a p chart for the process. (10)

Sample no.	No. of defects	Sample no.	No. of defects
1	10	7	7
2	9	8	10
3	8	9	13
4	11	10	12
5	7	11	13
6	12	12	14