Total Pages: 2

Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

FIRST SEMESTER (R&S) M. Tech DEGREE EXAMINATION, DECEMBER 2023

Discipline: MECHANICAL ENGINEERING

Course Code & Name: 221EME042 PRODUCTION & OPERATIONS MANAGEMENT

Max. Marks: 60 Duration: 2.5 Hours

PART A

Answer all questions. Each question carries 5 marks Marks

1 Explain three common metrics used to measure forecast accuracy in manufacturing. (5)

2 List and briefly explain three key stages in the Sales and Operations Planning (SOP) process. (5)

3 Define Enterprise Resource Planning (ERP) and discuss how it integrates with functional units within an organization. (5)

4 Explain the concepts of TQM and quality audits. (5)

5 Discuss the elements of JIT manufacturing (5)

PART B

Answer any 5 questions. Each question carries 7 marks

6 What are the types of demand pattern? Explain them with suitable sketches. (7)

7 Maxus Pizza point is a small restaurant catering to people with a taste for European pizza. One of their specialties is Maxus special pizza. The manager must forecast the weekly demand for these special pizzas so that he can order the ingredients weekly. The recent demand has been as follows

Week of	June 02	June 9	June 16	June 23	June 30	July 07
Pizza	50	65	52	56	55	60

(7)

Forecast the demand of Pizza for June 23 to July 14 by using the simple average method with n=3. Then repeat the forecast using the weighted moving average method with n=3 and weighs 0.5,0.3 and 0.2 with 0.5 applying to the recent demand.

8 Briefly describe two key components of the Master Production Scheduling (MPS) process. (7)

9 Explain the concept of Material Requirements Planning (MRP). List and briefly describe two lot sizing methods commonly used in MRP. (7)

10 Consider the following problem in single machine scheduling with independent jobs.

Job-j	1	2	3	4	5	6	7	8
Processing time (t_j)	5	12	8	10	3	15	8	6
Due date (d_j)	10	16	11	16	6	25	12	14
Weight (w_j)	2	1	1	2	3	4	2	3

(7)

a. Find the optimal sequence which will minimize the mean flow time and obtain the mean flow time.

b. Determine the sequence which will minimize weighted mean flow time. Also find the weighted mean flow time.

11 Find the sequence that minimizes the total time required in performing the following jobs on three machines in order ABC. Check whether Johnson's rule can be extended to this problem. Processing times (in hours) are given in the following table

Job	1	2	3	4	5
Machine A	11	13	15	12	20
Machine B	10	8	6	7	9
Machine C	12	20	15	19	7

(7)

12 Explain QFD. Summarise the benefits of QFD. (7)