Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Seventh Semester B.Tech Degree Examination December 2022 (2019 scheme)

Course Code: MET463

Course Name: OPERATIONS MANAGEMENT

Max. Marks: 100 **Duration: 3 Hours**

PART A

Answer all questions, each carries 3 marks. Marks

1	Define business process reengineering (BPR).	(3)
2	What are the factors affecting plant location?	(3)
3	Distinguish between design capacity and system capacity.	(3)
4	Give an example of a fixed-position layout for producing a product and providing a service.	(3)
5	Describe the Delphi method for forecasting.	(3)
6	How does adjusted exponential smoothing differ from exponential smoothing?	(3)
7	What is master production schedule?	(3)
8	Discuss about MRP II.	(3)
9	What are the objectives of scheduling?	(3)
10	Distinguish between single machine scheduling and flow shop scheduling.	(3)

PART B

Answer any one full question from each module, each carries 14 marks.

Module I

11 Describe the four basic types of production systems with suitable examples. Show them in product process matrix. What are the advantages and disadvantages of each? When should each be used? (14)

OR

12 There are five existing facilities which are to be served by a single new facility. The details of the existing facilities are shown in the following table. (14)

Existing facility *(i)*	1	2	3	4	5
Coordinates (a_i, b_i)	5, 10	20, 5	15, 20	30, 25	25, 5
No. of trips of loads/year (w_i)	100	300	200	300	100

i) Find the optimum location of the new facility based on centre of gravity method.

ii) Plot existing facilities and the location of a new facility on a grid map.

Module II

13 A company is setting up an assembly line to produce 192 units per 8-hour shift. The following table identifies the work elements, times, and immediate predecessors: (14)

Work Element	Time (Sec)	Immediate Predecessors
A	40	None
B	80	A
C	30	D, E, F
D	25	B
E	20	B
F	15	B
G	120	A
H	145	G
I	130	H
J	115	C, I

Group the activities in to work stations using rank positional weight method and compute the balancing efficiency.

OR

14 a) Explain the steps involved in systematic layout planning (SLP) with the help of a block diagram. (10)

b) State the basic differences between construction type and improvement type layout algorithms. (4)

Module III

15 A manufacturing company has monthly demand for one of its products as follows: (14)

Month	Feb.	March	April	May	June	July	Aug.	Sept.
Demand	520	490	550	580	600	420	510	610

Develop a three-period moving average forecast and a three-period weighted moving average forecast with weights of 0.50, 0.30, and 0.20 for the most recent

demand values, in that order. Calculate MAD for each forecast, and indicate which would seem to be most accurate.

OR

16 a) What are the types of demand pattern? Explain them with suitable sketches. (8)

b) Give and explain the three measures of goodness of a forecast. (6)

Module IV

17 a) What do you mean by aggregate planning? List and explain various pure strategies and mixed strategies? (10)

b) What are the different methods to determine effective lot size in MRP? (4)

OR

18 A firm producing hand trolley has following master production schedule (MPS) (14)

Week	1	2	3	4	5	6	7	8
Demand	200	NIL	NIL	240	NIL	240	NIL	220

Each hand trolley has a bin, two-wheel assemblies, two handle bars and a mounting base. Each wheel assembly has a wheel and two bearings. Order quantities, lead times and inventories on hand at the beginning of period 1 are shown below.

Part	Order Quantity	Lead Time (Week)	Inventory on Hand
Hand trolley	350	1	220
Bin	400	2	250
Wheel assemblies	800	2	120
Handle bars	850	2	105
Mountingbase	250	1	250
Wheel	600	2	300
Bearing	1500	2	200

A shipment of 800-wheel assemblies is already scheduled to be received at beginning of week 2. Also, another shipment of 250 mounting base is scheduled to be received at beginning of week 3. Complete material requirement plan for Hand trolley, Bin, Wheel assemblies and Handle bars.

Module V

19 Consider the following problem in single machine scheduling with independent jobs. (14)

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

(i) Find the optimal sequence which will minimize the mean flow time and also obtain the mean flow time.

(ii) Determine the sequence which will minimize weighted mean flow time. Also find the weighted mean flow time.

OR

20 Find the optimal sequence that minimizes the total time required in performing the following jobs on three machines in order A, B, C. Find makespan, idle times on machine B & machine C, and draw Gantt chart. Processing times (in hours) are given in the following table. (14)

Job	1	2	3	4	5
Machine A	8	10	6	7	11
Machine B	5	6	2	3	4
Machine C	4	9	8	6	5

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