Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

B.Tech Degree 7th semester (S,FE) Exam April 2025 (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		Discuss the system concept of production with a block diagram.	(3)
2		List any three factors that influence the location of manufacturing facility for the following products.	(3)
	(i)	Textiles	
	(ii)	Sugar	
3		How the plant layouts are related to type of production?	(3)
4		What is line balancing? Illustrate with an example.	(3)
5		Explain the basis for classifying forecasts in to short-term and long-term forecasting.	(3)
6		What is the difference between quantitative forecasting methods and qualitative forecasting methods?	(3)
7		What is aggregate planning? What are the objectives of aggregate planning?	(3)
8		What do you mean by product structure? Give an example.	(3)
9		What is a flow shop?	(3)
10		What is a Gantt chart? Mention its importance.	(3)

PART B

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

Module I

11	a)	Distinguish between "Make to stock" and "Make to order" production systems.	(6)
	b)	Explain the important functions of operations management.	(8)

OR

12 a) An army division in Iraq has five troop encampments in the desert, and the division leaders want to determine the best location for a supply depot to serve the camps. The (x, y) coordinates (in miles) of the camps, A, B, C, D, and E, and the daily amount of supplies (in tons) required at each camp are as follows: (14)

Camp	'x' coordinate	'y' coordinate	Daily tonnage (1000s)
A	110	120	85
B	70	300	110
C	520	350	75
D	300	450	60
E	400	600	100

The division commanders are limited to three possible sites for the supply depot. The coordinates (in miles) of these three potential sites are site 1 (400, 250), site 2 (100, 200), and site 3 (200, 500). Using the load-distance technique, determine the best site for the supply depot.

Module II

13 a) Discuss the steps of COMSOAL for line balancing. (7)

b) With the help of a block diagram explain the steps involved in systematic layout planning. (7)

OR

14 a) Discuss the steps of RPW method for line balancing. (7)

b) Compare product layout and process layout with schematic diagrams. (7)

Module III

15 a) Given below is the weekly demand and forecast data of a product marketed by a company. Compute mean absolute deviation (MAD), mean square error (MSE), mean forecast error (MFE) and mean absolute percentage error (MAPE) based on the data. (14)

Week	1	2	3	4	5	6
Demand	142	181	144	174	192	176
Forecast	155	157	159	161	163	165

OR

16 a) Compute the adjusted exponential forecast for the first week of March for a firm with the following data. Assume the forecast for the first week of January (F_0) as 600 and the corresponding initial trend (T_0) as 0. Let $\alpha = 0.1$ and $\beta = 0.2$ (14)

	January				February			
Week	1	2	3	4	1	2	3	4
Demand	650	600	550	650	625	675	700	710

Module IV

17 a) The forecast for group of items manufactured in a firm is shown below. (14)

Quarter	1	2	3	4	5	6	7	8
Demand	370	320	570	670	550	370	350	480

The firm estimates that it costs Rs. 200 per unit to increase the production rate, Rs. 250 per unit to decrease the production rate, Rs. 75 per unit per quarter to carry the items on inventory and Rs. 125 per unit if subcontracted. Compare the cost incurred if the following pure strategies are followed i) Changing the inventory levels (ii) Subcontracting.

OR

18 a) The company manufactures iron box. The MPS for the final assembly is as shown below. (14)

Month	1	2	3	4	5	6	7	8
Projected Requirement	_	3500	3000	4500	_	1000	4000	5500

The initial stock on hand is 1150 units. The carrying cost is Rs. 2.5 per unit/month and the lead time is one month. The ordering cost per order is Rs. 6000. Develop an EOQ solution and complete the material requirement plan for the final assembly.

Module V

19 a) Consider the following scheduling problem with 2 parallel processors and pre-emption is not allowed. (14)

Job-j	1	2	3	4	5	6	7	8
Processing time, t_j	4	6	3	7	2	1	5	9

Find the schedule as per LPT rule. Draw the Gantt chart and determine the makespan.

OR

20 a) Explain how Johnson's rule can be used for scheduling n jobs on 3 machines. Also describe how the Palmers heuristic uses ideas from Johnson's algorithm. (8)

b) What are the objectives of sequencing? Explain about SPT and EDD rules used in single machine scheduling. (6)

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