Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Seventh Semester B.Tech Degree (S, FE) Examination May 2024 (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 operations management.	(3)
2	What is make or buy decisions?	(3)
3	Why is capacity planning strategically important?	(3)
4	Discuss the steps of COMSOAL for line balancing.	(3)
5	What is the difference between a trend and a cycle and a seasonal pattern?	(3)
6	What are the advantages and limitations of moving average method?	(3)
7	Describe the output of aggregate planning. When is aggregate planning most useful?	(3)
8	What are the different methods to determine effective lot size in MRP?	(3)
9	What is Gantt chart? How it is used to represent the loading and scheduling?	(3)
10	What are the steps in McNaughton's algorithm to minimize the makespan in single machine scheduling problem with parallel processors.	(3)

PART B

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

Module I

11	a)	How manufacturing systems were organized based on volume and variety? Explain.	(6)
	b)	What are the important functions with in operations management? How does operations interact with other functional areas?	(8)

OR

12		The Burger Doodle restaurant chain uses a distribution center to prepare the food ingredients it provides its individual restaurants. The company is attempting to determine the location for a new distribution center that will service five	(14)

restaurants. The grid-map coordinates of the five restaurants and the annual number of 40-foot trailer trucks transported to each restaurant are as follows:

Restaurant	Coordinates		Annual truck shipments
	x	y	
1	100	300	35
2	210	180	24
3	250	400	15
4	300	150	19
5	400	200	38

The Burger Doodle restaurant chain is considering three potential sites, with the following grid-map coordinates, for its new distribution center: A (350, 300), B (150, 250), and C (250, 300). Determine the best location using the load-distance formula, and plot this location on a grid map with the five restaurants.

Module II

13 a) What are the types of layouts? Explain them with neat diagrams and examples. What are the applications of each type of layout. (10)

b) What is the importance of relationship chart in Automated Layout Design Programme (ALDEP). (4)

OR

14 Consider the following assembly network relationships of a product. The number of shifts per day is two and the number of working hours per shift is 8. The company aims to produce 80 units of the product per day. (14)

Group the activities in to work stations using Rank Positional Weight Method and compute Balancing Efficiency.

Operation No.	1	2	3	4	5	6	7	8	9	10
Immediate Preceding Tasks	--	1	1	1	2, 3	3, 4	5	5, 6	4, 6	7, 8, 9
Duration (Min)	7	2	2	5	8	3	4	7	9	8

Module III

15 What is the difference between quantitative forecast methods and qualitative forecast methods? Explain in detail the different types of quantitative and qualitative forecasting techniques. (14)

OR

16 Beta company has the following sales pattern. Compute the sales forecast for the year 10. (14)

Year	1	2	3	4	5	6	7	8	9
Sales (in Lakhs)	6	8	11	23	29	34	40	45	56

Module IV

17 The Good and Rich Candy Company makes a variety of candies in three factories worldwide. Its line of chocolate candies exhibits a highly seasonal demand pattern, with peaks during the winter months and valleys during the summer months. Given the following costs and quarterly sales forecasts, determine whether (a) level production, or (b) chase demand would more economically meet the demand for chocolate candies: (14)

Quarter	Sales forecast (lbs)
Spring	80,000
Summer	50,000
Fall	120.000
Winter	150,000

Hiring cost = Rs.100 per worker,

Firing cost = Rs. 500 per worker,

Inventory carrying cost = Rs. 0.50 per pound per quarter,

Regular production cost per pound = Rs. 2.00,

Production per employee = 1000 pounds per quarter

Beginning workforce = 100 workers.

OR

18 a) What are the objectives, inputs, and outputs of an MRP system? Explain. (8)

b) What is the purpose of phantom bills, K-bills, and modular bills of material? (6)

Module V

19 a) What are the different measure of performances in single machine scheduling problem with independent jobs. (4)

b) Consider the following n jobs parallel identical machines problem. (10)

Job - *j*	1	2	3	4	5	6	7	8
Processing time *tj*	4	6	3	7	2	1	5	9

Find the schedule which will minimize the mean flow time, if the number of parallel identical machines is 2. Find makespan and draw Gantt chart.

OR

20 Consider the following flow shop scheduling problem: (14)

Job	Processing time (In hours)		
	Machine 1	Machine 2	Machine 3
1	4	5	11
2	12	2	6
3	8	10	14
4	11	11	3

Check whether Johnsons rule can be applied. If not solve the problem using Palmer's heuristic. Find makespan, idle times on machine 1 & machine 2 and draw Gantt chart.

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