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B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

June 2025 Semester End Main Examinations

Programme: B.E. **Semester: VI**

Branch: Industrial Engineering and Management **Duration: 3 hrs.**

Course Code: 23IM6PCLOM / 22IM6PCLOM **Max Marks: 100**

Course: Lean and Operations Management

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

Important Note: Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.

		UNIT - I	CO	PO	Marks
1	a)	Explain the historical development of Operations Management and its evolution into modern practices.	*CO1*	*PO1* *PO12*	**10**
	b)	What are the key principles of Lean Manufacturing, and how do they differ from traditional manufacturing systems?	*CO1*	*PO1* *PO2* *PO12*	**10**
		OR			
2	a)	Discuss the difference between manufacturing and non-manufacturing systems and how operations management applies to both.	*CO1*	*PO1* *PO2* *PO6*	**10**
	b)	Define the types of waste in Lean Manufacturing and how waste elimination contributes to value creation.	*CO1*	*PO1* *PO2*	**10**
		UNIT - II			
3	a)	Describe the different types of forecasting methods: Opinion and Judgmental methods, and Time Series methods.	*CO2*	*PO1* *PO2* *PO4*	**10**
	b)	A company manufactures bicycles and wants to use Material Requirements Planning (MRP) to determine the number of parts needed for production. Each bicycle consists of:1 frame, 2 wheels, 1 handlebar,1 seat. The company has received an order for 100 bicycles to be delivered in week 4. The lead times for each component are: Frame: 2 weeks, Wheel: 1 week , Handlebar: 1 week, Seat: 1 week, The company currently has the following inventory: Frames: 10 in stock, Wheels: 50 in stock, Handlebars: 20 in stock, Seats: 15 in stock. Determine how many parts should be ordered and when.	*CO2*	*PO1* *PO2* *PO4* *PO5*	**10**
		OR			

	4	a)	Explain Aggregate Planning and the methods used for it.	*CO2*	*PO1* *PO2*	**10**
		b)	A small business wants to predict the future sales of its product using linear regression analysis. The past sales data for five months is as follows: Month: 1, 2, 3, 4, 5 Sales(units): 50, 60, 65, 70, 80	*CO2*	*PO1* *PO2* *PO4* *PO5*	**10**
			UNIT - III			
	5	a)	A flow shop has three jobs (P, Q, R) to be processed on three machines (M1, M2, M3). The processing times (in hours) are given below: P: 2, 3, 4 Q: 3, 2, 1 R: 1, 4, 2 Determine the optimal sequence of jobs to minimize the total completion time using the CDS algorithm.	*CO3*	*PO1* *PO2* *PO4* *PO5*	**10**
		b)	A job shop has three jobs (A, B, and C) to be processed on two machines (M1 and M2). The processing times (in hours) are given below: A: 3, 2 B: 4, 1 C: 2, 3 Determine the optimal sequence of jobs to minimize the total completion time using the Johnson's rule.	*CO3*	*PO1* *PO2* *PO4* *PO5*	**10**
			OR			
	6	a)	A machine shop has four jobs (A, B, C, and D) that need to be processed on a single machine. The processing times (in hours) and due dates are given below: A: 6 B: 8 C: 7 D: 3 Determine the job sequence using Shortest Processing Time (SPT) rule to minimize mean flow time. Also calculate the mean flow time.	*CO3*	*PO1* *PO2* *PO4* *PO5*	**10**
		b)	Differentiate between backward scheduling and forward scheduling with example.	*CO3*	*PO1* *PO2*	**10**
			UNIT - IV			
	7	a)	Describe the main characteristics of a Just-in-Time (JIT) operation.	*CO4*	*PO1* *PO12*	**10**

		b)	What are the 5S principles, and how do they contribute to a lean environment?	*CO4*	*PO1* *PO2*	**10**
			OR			
	8	a)	Explain the Pull Method of material flow and its advantages over the Push Method.	*CO4*	*PO1* *PO2*	**10**
		b)	Explain standard work, visual control, and quality at the source in Lean Manufacturing.	*CO4*	*PO1* *PO2* *PO3*	**10**
			UNIT - V			
	9	a)	What is Preventive Maintenance? How is it different from Reactive Maintenance?	*CO5*	*PO1* *PO2*	**10**
		b)	What is Poka-Yoke? Give examples to illustrate its application.	*CO5*	*PO2*	**10**
			OR			
	10	a)	Explain Production Leveling (Heijunka) and how it benefits operations management.	*CO5*	*PO1* *PO2* *PO12*	**10**
		b)	What is Value Stream Mapping (VSM)? Explain the steps involved in creating a VSM.	*CO5*	*PO1* *PO2* *PO3* *PO5*	**10**

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