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

Autonomous Institute Affiliated to VTU

October 2024 Supplementary Examinations

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

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

Course Code: 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.

		UNIT - I	*CO*	*PO*	Marks
1	a)	Brief on the developments during the Four phases of historical evolution which led to today's industrial growth.	*CO1*		**10**
	b)	Contrast between Traditional and Lean manufacturing using any 5 points	*CO3*	*PO2*	**10**
		UNIT - II			
2	a)	Discuss the four components of Timeseries forecasting method with the help of diagrams	*CO1*		**10**
	b)	A firm uses simple exponential smoothing with $\alpha = 0.1$ to forecast demand. The forecast for the week of February 1 was 500 units, whereas actual demand turned out to be 450 units a) Forecast the demand for the week of February 8 b) Assume that the actual demand during the week of February 8 turned out to be 505 units. Forecast the demand for the week of February 15, Continue forecasting through March 15, assuming that subsequent demands were actually 516, 488, 467, 554 and 510 units	*CO1*	*PO1*	**10**
		OR			
3	a)	An aggregate plan is to be developed for the forecast of demand covering nine periods shown in table. Other relevant production and cost information is also provided. Using the demand shown in Table (plus 10 more units in periods 8 and 9), develop an aggregate plan based upon the use of the 10 regular-time production workers at a constant rate, with inventories used to satisfy peak demand. The inventory carrying cost is Rs. 35 per unit per period. Some subcontracting can be used at a labour cost of Rs. 50 per hour if necessary. Assume a constant output rate of	*CO2* *CO3*	*PO1* *PO2*	**10**

40 units per period.
No safety stock is required, but total demand of 380 units must be met.

Demand, production, and cost information

Month	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Total
Forecast	40	25	55	30	30	50	30	60	40	360

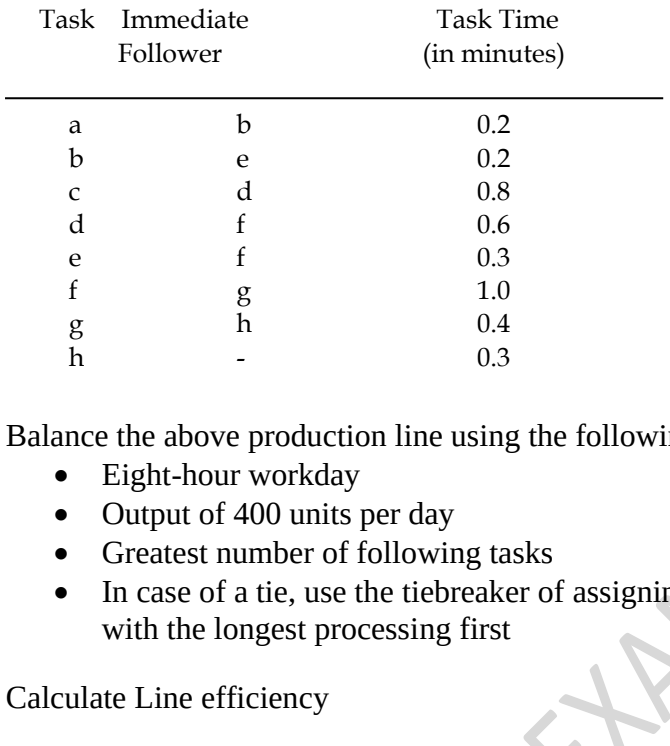
Production information		Cost information	
Current number workers	10	Hiring cost	Rs.600/employee
Worker time/month	160 hr	Layoff cost	Rs.500/employee
Time to produce one unit	40 hr	Regular-time cost	Rs. 30/hr
Individual worker output:		Overtime cost	Rs. 45/hr
(160 hr/mo/40 hr/unit)	4 units	Subcontract labor cost	Rs. 50/hr
Safety stock of inventory required	10 units	Inventory carrying cost	Rs. 35/period

	b)	Discuss about MRP system parameters	*CO1*		**10**
		UNIT - III			
4	a)	Elaborate on the database system that is essential to a workable PAC system	*CO1*		**05**
	b)	Find the sequence that minimizes the total elapsed time required to complete the following tasks. Each job is processed in the order ACB.	*CO2* *CO3*	*PO1* *PO2*	**15**
		OR			
5	a)	Consider the Aircraft Repair facility, evaluate the sequences created according to the FCFS and SPT rules	*CO3* *CO4*	*PO2* *PO3*	**10**
	b)	Use graphical method to minimize the time needed to process the following jobs on the machines shown below also calculate the total time needed to complete both the jobs.	*CO2*	*PO1*	**10**
		UNIT - IV			
6	a)	Explain how the characteristics such as preventive maintenance and flexible resources, influence the just in time operations	*CO1*		**10**
	b)	Brief on five Communication of Standard work to employees	*CO1*		**10**

Machines	Processing Times Job (i) 1	2	3	4	5	6	7
M/C A	12	6	5	11	5	7	6
M/C B	7	8	9	4	7	8	3
M/C C	3	4	1	5	2	3	4

Waiting job (in FCFS sequence)	Processing Time (in days)	Due Date (in days from now)
A	4	6
B	17	20
C	14	18
D	9	12
E	11	12
	Total 55 days	

Job1	Sequence of machines time	A2	B3	C 4	D6	E2
Job 2	Sequence of machines time	C4	A 5	D 3	E2	B6

			UNIT - V			
	7	a)	 Balance the above production line using the following data: • Eight-hour workday • Output of 400 units per day • Greatest number of following tasks • In case of a tie, use the tiebreaker of assigning the task with the longest processing first Calculate Line efficiency	*CO2* *CO3*	*PO1* *PO2*	**10**
		b)	How Quality at the Source works? How it can be implemented? And what are the advantages of it?	*CO1*		**10**

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