U.S.N

P.E.S. College of Engineering, Mandya - 571 401

(An Autonomous Institution affiliated to VTU, Belagavi)

Seventh Semester, B.E. - Mechanical Engineering
Semester End Examination; February - 2022
Production Management

Time: 3 hrs   Max. Marks: 100

Course Outcomes

The Students will be able to:

CO1: Define production management, product life cycle, Explain process focused system, product focused system, and product focused organization structure.

CO2: Analyze classification of forecasting methods, simple moving average, weighted moving averages, and exponentially weighted moving averages, trend model with seasonal variation, Delphi technique.

CO3: Discuss cost analysis and Explain objectives of good plant layout

CO4: Compare scheduling, scheduling strategies, Apply scheduling sequence operation standard scheduling techniques, Johnson's rule.

CO5: Discuss inventory control, inventory control terminology, deterministic model in inventory control, dispatching and expediting.

Note: **I) PART - A** *is compulsory.* **Two** *marks for each question.*

II) PART - B: *Answer any* **Two** *sub questions (from a, b, c) for Maximum of* **18 marks** *from each unit.*

Q. No.	Questions	Marks	BLs	COs	POs
	PART - A	**10**			
1 a.	Outline the importance of product focused organization structure.	2	L2	CO1	PO1
b.	Illustrate the uses of forecasting.	2	L2	CO2	PO1
c.	Summarize the factors affecting plant location.	2	L2	CO3	PO1
d.	Classify the standard scheduling techniques.	2	L2	CO4	PO1
e.	Explain the selective control of inventory.	2	L2	CO5	PO1
	PART - B	**90**			
	UNIT - I	**18**			
1. a	Explain the product life cycle and discuss the relationship with productive system.	9	L2	CO1	PO1
b.	Identify the differences between product focused and process focused organization and also explains the productive system positioning strategies.	9	L2	CO1	PO1
c.	Identify the concepts of production management. Explain in brief.	9	L2	CO1	PO1
	UNIT - II	**18**			
2 a.	Why forecasting is needed in an organization? Outline the objectives and limitation of the forecasting.	9	L2	CO2	PO2
b.	Using the data given in the Table-1 below, and by linear regression analysis forecast for the month of Jan. and Feb. next year.	9	L3	CO2	PO2

Table 1. Sales data for different period.

Month	Jan	Feb	Mar	Apr	May	Jun
Sales (1000s)	250	210	223	270	245	261
Month	Jul	Aug	Sep	Oct	Nov	Dec
Sales (1000s)	212	212	246	252	261	224

c. A firm uses exponential smoothing with α = 0.1 to forecast demand. The forecast for the week of February 1 was 500 units whereas the actual demand turned out to be 450 units.

   i) Forecast the demand for the week of Feb. 8

   ii) Assume that the actual demand during week of Feb. 8 turned out to be 505 units. Forecast for the week of Feb. 15 and continue till March 15 assuming the subsequent demands are actually 516, 488, 467, 554 and 510 units

9   L3   CO2   PO2

UNIT - III

18

3 a. Outline the important factors influencing plant location and also discuss the general procedure for identifying the facilities location.

9   L2   CO3   PO2

b. A new plant needs to be established to receive raw material from three suppliers P, Q and R and to supply finished products to three warehouses U, V and W. The sources of raw material and the destination points may be considered as the existing facilities. The coordinates of the existing facilities and the amounts of material movements between the existing facilities and the new facilities are shown in Table 2.

Table 2 Data for location of new facility.

Sl. No.	Existing Facility (i)	Coordinates of i		Material movement to new facility (Wi)
		X_i	Y_i	
1	P	400	300	600
2	Q	200	500	400
3	R	300	100	500
4	U	100	550	300
5	V	500	400	600
6	W	350	600	600

9   L3   CO3   PO3

Assuming the material handling cost to be proportional to the product of the amount of material movement and the distance of movement, find the optimal location of the new facility.

c. Summarize the objectives of a good plant layout. Arrange the six work centers into 3(rows) x 2(column) grid that satisfies the nearness criteria shown in Fig. 1 on the Muther Grid.
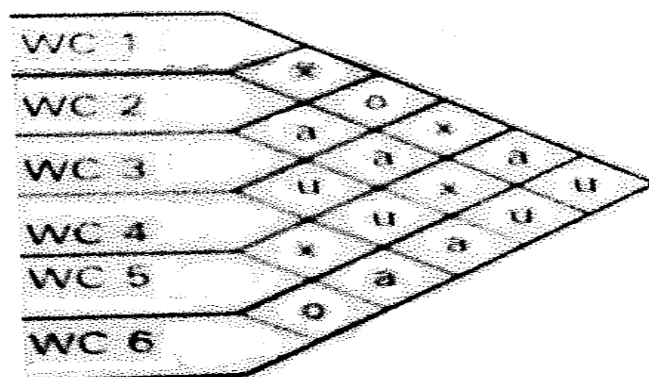
9   L3   CO3   PO2

Fig. 1 Muther Grid

UNIT - IV

4 a. Find the sequence for the following eight jobs as shown in Table 3, that minimizes the total elapsed time for completion of all jobs, each job is processed in order CAB. Find the total elapsed time and idle time of each machine.

Table 3, Sequence of jobs on machines   9   L3 CO4 PO2

	Jobs	1	2	3	4	5	6	7	8
Machines	A	4	6	7	4	5	3	6	2
	B	8	10	7	8	11	8	9	13
	C	5	6	2	3	4	9	15	17

b. Use graphical method to minimize the time needed for process the following jobs on the machines shown in Table 4. Also calculate the idle time needed to complete both jobs and best sequence for the jobs.

Table 4, Sequence of jobs along with timings   9   L3 CO4 PO2

	Sequence	A	B	C	D	E
Job1	Time	3	4	2	6	2
Job 2	Sequence	B	C	A	D	E
	Time	5	4	3	2	6

c. Five jobs A, B, C, D and E can be processed at any one of four work centres as shown in Table 5. The process times for each job at each work centre are shown in the matrix. The capacity /number of hours available at each work is also indicated. By index method of scheduling allocate the jobs to the various Work centres.

Table 5: Processing of jobs in different work centres.   9   L4 CO4 PO3

Job	Work centre			
	1	2	3	4
A	10	9	8	12
B	3	4	5	2
C	25	20	14	16
D	7	9	10	9
E	18	14	16	25
Hours available	15	15	15	20

UNIT - V

5 a. What do you mean by dispatching? Discuss the functions of dispatching. Explain the following with respect to production control:

 i) Expediting

 ii) Follow up

 9   L2   CO5   PO2

 b. A stockiest has to supply 400 units of a product every week to his customers. He gets the product at Rs. 50/- per unit from the manufacturer. The cost of ordering and transportation from the manufacturer is Rs. 75 per order. The cost of carrying inventory is 7.5% per year of the cost of the product.

 i) What is the economic lot size?

 ii) How long it would take to produce economic lot size?

 iii) What is the optimum cost per week?

 9   L3   CO5   PO2

 c. Summarize the importance of ABC analysis in inventory management and also illustrate the cost associated with inventory policy.

 9   L2   CO5   PO2

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