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

(An Autonomous Institution affiliated to VTU, Belagavi)

Seventh Semester, B.E. - Industrial and Production Engineering

Semester End Examination; Dec. - 2019

Operations Management

Time: 3 hrs *Max. Marks: 100*

***Note**: Answer **FIVE** full questions, selecting **ONE** full question from each unit.*

UNIT - I

1 a. With a block diagram, explain the historical development of operations management. 8

b. Discuss the various factors affecting productivity. 6

c. Explain the types of production system. 6

2 a. What are the various steps in decision making process? 6

b. Write a note on the following: 6

i) Fixed costs ii) Variable costs iii) Total costs iv) Profit volume ratio

c. A company has annual fixed costs of Rs. 5 lakhs and variable costs of Rs. 15 per unit. It is considering an additional investment of Rs. 2 lakhs which will increase the fixed costs by Rs. 1 lakh per year and will increase the contribution by Rs. 5 per unit. No change is anticipated in the sale volume. What is the break even volume, if the new investment is made? 8

UNIT - II

3 a. Differentiate between manufacturing system and service systems. 5

b. Explain various objectives of forecasting. 6

c. The past date for the sales of wet grinders of a particular company in an area is shown below:

Month	2001 Jan	Feb	Mar	April	May	June
Sales	585	610	675	750	860	970

Forecast the demand for the month of July 2001 using, 9

i) Simple average for all previous months

ii) A three month moving average

iii) A three month moving average where the weights are 0.5 for the last month, 0.3 and 0.2 for the months previous to that respectively

4 a. How do you classify forecasting methods and explain. 5

b. The table below gives the sales record of a firm. Using Regression Analysis forecast the sales in the month of January and February next year. 10

Month	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec
Sales in (units)	90	111	99	89	87	84	104	102	95	114	103	113

c. Define aggregate planning. List and explain the aggregate planning strategies used in an organization. 5

Contd…2

UNIT - III

5 a. What are the functions of Master scheduling? 5

b. List the concepts and terminology used in the study of MRP and explains. 10

c. Complete the MRP shown below and find the amount of inventory on hand at the end of week 8 5

Order Quantity = 500	Week							
Lead time = 4 weeks	1	2	3	4	5	6	7	8
Projected requirements	150	150	150	150	200	200	180	320
Receipts			500					
On hand at the end of period - 300								
Planned order release								

6 a. Draw the CRP flow chart and explain. 8

b. Write a note on Bill Of Materials (BOM). 5

c. With a block diagram, explain planning horizon of master schedule. 7

UNIT - IV

7 a. Classify the scheduling strategies and explain briefly. 10

b. Define the following and mention its applications: 10

i) FCFS ii) SPT iii) LPT iv) EDD v) RS

8 a. Write a note on the following: 12

i) Gantt Load chart

ii) Duties of dispatching section

iii) Capacity control

b. Consider the following single machine scheduling problem with weights: 8

Jobs (j)	1	2	3	4	5
Processing Time (T_j)	15	4	5	14	8
Weights (W_j)	1	2	1	2	3

Determine; i) The sequence SPT ii) Weight mean flow time

UNIT - V

9 a. 5 jobs have arrived in alphabetical order. Calculate how much delay is involved in delivering each job, if jobs are processed? i) FCFS basis ii) SPT basis 10

Jobs	A	B	C	D	E
Processing Time (day)	4	17	14	9	11
Due date from now	6	20	18	12	12

Contd…3

b. The time spent (in minute) in processing of 2 jobs on six machines A, B, C, D, E and F and necessary technological ordering of machine are as follows:

Job1	A - 20	C - 10	D - 10	B - 30	E - 25	F - 15
Job2	A - 10	C - 10	E - 15	D - 10	F - 15	B - 20

10

Use graphical method to determine an optimal sequence of jobs which minimize the total elapsed time. Also determine which job is done first on each of the machine?

10 a. Use Johnson's rule to determine the sequence that result in the minimum flow time for the seven jobs listed below. All jobs must follow the same sequence of machine first and then polish time required to do job (min)

	A	B	C	D	E	F	G
Machine	10	6	5	4	6	9	7
Polish	2	3	12	5	9	11	6

10

i) What is the optimal sequence of jobs?

ii) What is the minimum time flow to finish these seven jobs?

b. Write a note on the following:

i) Automated Guided vehicle system

ii) Conveyor system

10

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