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P.E.S. College of Engineering, Mandya - 571 401
(An Autonomous Institution affiliated to VTU, Belgaum)
Seventh Semester, B.E. - Industrial and Production Engineering
Semester End Examination; Dec - 2016/Jan - 2017
Operation Management

Time: 3 hrs   *Max. Marks: 100*

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

UNIT - I

1 a.	Explain the significant trend of gradual shift from manufacturing to service and information based industries.	10
b.	Write a note on major contributions made to operations management during scientific era.	10
2 a.	Explain the decision making process with a neat frame work sketch.	6
b.	A publisher sells a text book priced Rs. 200 each. The production cost for a volume of 10000 books are as follows, labour cost Rs. 240000, Materials Rs. 480000, Total overheads Rs. 350000, selling and administration Rs. 200000. Interest on capital Rs. 320000. Draw break even chart and find BEP.	8
c.	Explain the whole process of decision methodology.	6

UNIT - II

3 a.	Enumerate the characteristics of manufacturing and service system.	8
b.	Write the importance of forecasting.	5
c.	Explain the long term and short term objectives of forecasting.	7
4 a.	A casting company requires moulding machines capable of producing 3,20,000 good products per year. They will be installed in the production line that normally produces 20% rejects because of strict quality check. i) What is system capacity? ii) If it takes 3 minutes to mould each part and the plant operates for 4000 hr/year and if the moulding machines are used only 50% of time and are 90% efficient. What output is achieved per year? iii) How many moulding machines are required?	10
b.	Shipment in tons of welded tube by an aluminium produce is given by,	10

Year	1	2	3	4	5	6	7	8	9	10	11
Units	2	3	6	10	8	7	12	14	14	18	19

i) Compute three year moving average

ii) Plot the graph

iii) Using weights of 3 for most recent data, 2 for next and 1 for the oldest forecast. Find the forecast for Shipment in 12th year.

UNIT - III

5 a. Briefly explain the objectives of aggregate planning. 6

b. Explain the important strategies of aggregate planning. 8

c. Discuss the main objectives of scheduling. 6

6 a. Complete the MRP shown below and find the amount of inventory on hand at the end of the week. 10

Over Quantity = 500 Lead time = 4 weeks	Weeks							
	1	2	3	4	5	6	7	8
Projected Requirements	150	150	150	150	200	200	180	320
receipts			500					
On hand at end of period 300	150	0	350	200				
Planned order Release								

b. Eureka forger has a current employee base of 100 with quarterly demand forecast given in table below. The initial safety stock is 100 units with an average production rate of 50 units per employee per quarter. The hiring and training cost is Rs. 400 per employee and lay off cost is Rs. 600 per employee. Inventory carrying cost is Rs. 8/unit/quarter. Develop an aggregate plan by varying workforce and inventory to meet demand. 10

Quarter	1	2	3	4	Total
Demand	350	500	400	345	1595

UNIT - IV

7 a. Explain the steps in capacity management. 6

b. Discuss the long term and short term strategies of capacity planning. 8

c. Differentiate between finite and infinite loading. 6

8 a. Discuss forward and backward scheduling. 8

b. Explain the scheduling objectives of PAC. 6

c. Explain Gantt load chart and Gantt schedule chart. 6

UNIT - V

9 a. There are five jobs which are waiting to be processed at a shop. The jobs have arrived in the alphabetical order. Data on processing time delivery due in days from now onward is tabulated. 5

Jobs	A	B	C	D	E
Processing time days	4	17	14	9	11
Due No. of days from now	6	20	18	12	12

Calculate how much delay in days is involved in delivering each job, if jobs are processed based on shortest processing time.

b. Find the sequence that minimizes the total elapsed time in (hours) required to complete the following jobs on 3 machines M_1, M_2, M_3 in order M_1, M_2 M_3. Also find the total minimal elapsed time.

7

	Jobs	A	B	C	D	E
Machines	M_1	5	7	6	9	5
	M_2	2	1	4	5	3
	M_3	3	7	5	6	7

c. Use graphical method to minimize the time needed to process the following jobs on the machines show. Also calculate the total time needed to complete both jobs.

8

Job 1	Sequence	A	B	C	D	E	Total
	Time	3	4	2	6	2	17
Job 2	Sequence	B	C	A	D	E	
	Time	5	4	3	2	6	20

10 a. Explain the characteristics of JIT. 8

b. Write a brief note on :

i) Continuous Improvement 12

ii) Uniform workstation loads.

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