PVP 19

Code: 19ME4701D

IV B.Tech - I Semester – Regular Examinations - DECEMBER 2022

PRODUCTION PLANNING AND CONTROL
(MECHANICAL ENGINEERING)

Duration: 3 hours Max. Marks: 70

Note: 1. This question paper contains two Parts A and B.
2. Part-A contains 5 short answer questions. Each Question carries 2 Marks.
3. Part-B contains 5 essay questions with an internal choice from each unit. Each question carries 12 marks.
4. All parts of Question paper must be answered in one place.

BL – Blooms Level CO – Course Outcome

PART – A

		BL	CO
1. a)	List the objectives of PPC.	L1	CO1
1. b)	Discuss about Kanban system.	L1	CO2
1. c)	State the purpose of the master production schedule.	L1	CO3
1. d)	Indicate the three major aggregate planning strategies.	L2	CO4
1. e)	Describe types of follow up.	L2	CO5

PART – B

			BL	CO	Max. Marks
UNIT-I					
2	a)	Discuss about organization of production planning and control department. Draw the internal organization of PPC.	L2	CO1	6 M
	b)	Describe least square method of sales forecasting with its advantages and limitations.	L2	CO1	6 M
OR					
3	a)	How would you describe general principles of forecasting?	L2	CO1	6 M

<table>
<tr><td></td><td>b)</td><td>Demand (In thousands) for bearings of a company is given below. Forecast for the year 2009 was 75 Units. (i) Estimate the sales forecast for 2016 with least square method. (ii) Obtain the forecast of demand for the year 2016 by exponential smoothing method with α=0.5 and compare with earlier forecast.
<table>
<tr><td>Year</td><td>2009</td><td>2010</td><td>2011</td><td>2012</td><td>2013</td><td>2014</td><td>2015</td></tr>
<tr><td>Demand</td><td>77</td><td>88</td><td>94</td><td>85</td><td>91</td><td>98</td><td>90</td></tr>
</table></td><td>L3</td><td>CO1</td><td>6 M</td></tr>
<tr><td colspan="6">UNIT-II</td></tr>
<tr><td rowspan="2">4</td><td>a)</td><td>Prepare ABC analysis on the following sample of items in an inventory
<table>
<tr><th>Item</th><th>Annual consumption(units)</th><th>Price/unit(in Rs)</th></tr>
<tr><td>1</td><td>5950</td><td>5</td></tr>
<tr><td>2</td><td>21250</td><td>4</td></tr>
<tr><td>3</td><td>1000</td><td>8.75</td></tr>
<tr><td>4</td><td>2087</td><td>5</td></tr>
<tr><td>5</td><td>27600</td><td>2.50</td></tr>
<tr><td>6</td><td>28000</td><td>0.50</td></tr>
<tr><td>7</td><td>36000</td><td>0.25</td></tr>
<tr><td>8</td><td>911</td><td>4.10</td></tr>
<tr><td>9</td><td>300</td><td>2.90</td></tr>
<tr><td>10</td><td>29450</td><td>0.30</td></tr>
<tr><td>11</td><td>11500</td><td>8.15</td></tr>
<tr><td>12</td><td>3934</td><td>5</td></tr>
</table></td><td>L3</td><td>CO2</td><td>8 M</td></tr>
<tr><td>b)</td><td>Summarise the function of inventories.</td><td>L2</td><td>CO2</td><td>4 M</td></tr>
<tr><td colspan="6">OR</td></tr>
<tr><td rowspan="2">5</td><td>a)</td><td>Define EOQ. Derive the expression for EOQ when the demand of the item is uniform, the production rate is infinite and no stocks-outs are allowed.</td><td>L2</td><td>CO2</td><td>8 M</td></tr>
<tr><td>b)</td><td>Describe various steps involved in material requirement planning.</td><td>L2</td><td>CO2</td><td>4 M</td></tr>
<tr><td colspan="6"></td></tr>
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<tr><td colspan="6">UNIT-III</td></tr>
<tr><td rowspan="2">6</td><td>a)</td><td>Define routing and its significance. Explain about the important components of routing sheets.</td><td>L2</td><td>CO3</td><td>6 M</td></tr>
<tr><td>b)</td><td>Show the bill of material for any product with an example.</td><td>L3</td><td>CO3</td><td>6 M</td></tr>
<tr><td colspan="6">OR</td></tr>
<tr><td rowspan="2">7</td><td>a)</td><td>Choose five jobs in waiting for setting processed on a machine. Their sequence of arrival, processing time and due-date are given in the table below
<table>
<tr><th>Job(Sequence of arrival)</th><th>Processing time(days)</th><th>Due date (days from hence)</th></tr>
<tr><td>A</td><td>4</td><td>6</td></tr>
<tr><td>B</td><td>5</td><td>7</td></tr>
<tr><td>C</td><td>3</td><td>8</td></tr>
<tr><td>D</td><td>7</td><td>10</td></tr>
<tr><td>E</td><td>2</td><td>3</td></tr>
</table>
SCHEDULE THE JOB USING FCFS, SPT, LCFS, STR rules. Compare the result.</td><td>L4</td><td>CO3</td><td>8 M</td></tr>
<tr><td>b)</td><td>Discuss the differences between scheduling and loading.</td><td>L2</td><td>CO3</td><td>4 M</td></tr>
<tr><td colspan="6">UNIT-IV</td></tr>
<tr><td rowspan="2">8</td><td>a)</td><td>Explain the objectives of aggregate production planning and master production scheduling. What are the steps in preparing aggregate plans.</td><td>L3</td><td>CO4</td><td>6 M</td></tr>
<tr><td>b)</td><td>What is line balancing? What is its importance in PPC? Explain it with an example.</td><td>L2</td><td>CO4</td><td>6 M</td></tr>
<tr><td colspan="6">OR</td></tr>
</table>

<table>
<tr><td>9</td><td>Develop a solution for the following line balancing problem, allowing a cycle time of 5minutes.
a) Draw the precedence diagram for the set of tasks.
b) Calculate the theoretical minimum number of workstations.
c) Balance this line using the longest task time heuristic.
d) What tasks are assigned to which stations?
e) Does the solution have the minimum number of stations? Explain.
f) How much idle time is there, summed over all workstations.
g) What is the efficiency of this line?
<table>
<tr><th>Work Task</th><th>Task Time (seconds)</th><th>Task Predecessor(s)</th></tr>
<tr><td>A</td><td>70</td><td>-</td></tr>
<tr><td>B</td><td>60</td><td>A</td></tr>
<tr><td>C</td><td>120</td><td>B</td></tr>
<tr><td>D</td><td>60</td><td>-</td></tr>
<tr><td>E</td><td>240</td><td>C,D</td></tr>
<tr><td>F</td><td>100</td><td>A</td></tr>
<tr><td>G</td><td>190</td><td>E,F</td></tr>
</table></td><td>L4</td><td>CO4</td><td>12 M</td></tr>
<tr><td colspan="5">UNIT-V</td></tr>
<tr><td rowspan="2">10</td><td>a)</td><td>State the principle functions of Dispatching. What are the documents generally prepared while performing dispatching function?</td><td>L2</td><td>CO5</td><td>6 M</td></tr>
<tr><td>b)</td><td>Explain the need of existence of follow up procedure.</td><td>L2</td><td>CO5</td><td>6 M</td></tr>
<tr><td colspan="5">OR</td></tr>
<tr><td rowspan="2">11</td><td>a)</td><td>Explain the applications of computer in production planning and control.</td><td>L2</td><td>CO5</td><td>6 M</td></tr>
<tr><td>b)</td><td>Distinguish between centralized and decentralized dispatching.</td><td>L3</td><td>CO5</td><td>6 M</td></tr>
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