

Code: 20HS7701F

**IV B.Tech - I Semester – Regular / Supplementary Examinations
OCTOBER 2024**

**INDUSTRIAL ENGINEERING MANAGEMENT
(Common for ALL BRANCHES)**

Duration: 3 hours

Max. Marks: 70

Note: 1. This paper contains questions from 5 units of Syllabus. Each unit carries 14 marks and have an internal choice of Questions.
2. All parts of Question must be answered in one place.

BL – Blooms Level

CO – Course Outcome

			BL	CO	Max. Marks
UNIT-I					
1	a)	Define industrial engineering and management. Explain the scope and applications of it.	L3	CO1	7 M
	b)	What is Maslow’s Hierarchy of human needs? How it contributes to the organization?	L2	CO1	7 M
OR					
2	a)	What are the types of organization? Illustrate them with suitable examples.	L3	CO1	7 M
	b)	State and describe the Taylor’s principles of scientific management.	L2	CO1	7 M
UNIT-II					
3	a)	Define leadership. Explain various types of leadership with suitable organizational examples.	L2	CO2	7 M
	b)	What are the factors governing the plant location? Explain with any one specific industry.	L3	CO2	7 M
OR					
4	a)	What are advantages and disadvantages of urban and suburban locations for a plant? Compare rural and urban sites for the location of the plant.	L2	CO2	7 M

	b)	Explain the importance of travel chart in effective layout of a production plant. Prepare a travel chart for a hypothetical engineering concern with 4 functional departments, i.e. foundry, machining, welding and inspection.	L3	CO2	7 M
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UNIT-III

5	a)	What are the objectives of inspection & quality control? What are the differences between variable & attribute charts?	L2	CO3	7 M																																									
	b)	<p>The thickness (mm) of paint on cars for sample size of five cars from each shift are given below,</p> <table border="1" style="margin-left: 40px;"> <thead> <tr> <th rowspan="2">Subgroup – shift no.</th> <th colspan="5">Thickness in mm</th> </tr> <tr> <th>T1</th> <th>T2</th> <th>T3</th> <th>T4</th> <th>T5</th> </tr> </thead> <tbody> <tr> <td>1.</td> <td>2.7</td> <td>2.3</td> <td>2.6</td> <td>2.4</td> <td>2.7</td> </tr> <tr> <td>2.</td> <td>2.6</td> <td>2.4</td> <td>2.6</td> <td>2.3</td> <td>2.8</td> </tr> <tr> <td>3.</td> <td>2.8</td> <td>2.4</td> <td>2.3</td> <td>2.6</td> <td>2.5</td> </tr> <tr> <td>4.</td> <td>2.6</td> <td>2.2</td> <td>2.3</td> <td>2.8</td> <td>2.3</td> </tr> <tr> <td>5.</td> <td>2.2</td> <td>2.3</td> <td>2.4</td> <td>2.6</td> <td>2.8</td> </tr> </tbody> </table> <p>For sample size of 5, Take $D3=0$, $D4=2.1145$, $A2=0.5768$ Plot X-bar and R-bar charts for the above problem. State whether the process is in control or not. If not, how do you modify plots and process?</p>	Subgroup – shift no.	Thickness in mm					T1	T2	T3	T4	T5	1.	2.7	2.3	2.6	2.4	2.7	2.	2.6	2.4	2.6	2.3	2.8	3.	2.8	2.4	2.3	2.6	2.5	4.	2.6	2.2	2.3	2.8	2.3	5.	2.2	2.3	2.4	2.6	2.8	L3	CO3	7 M
Subgroup – shift no.	Thickness in mm																																													
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5.	2.2	2.3	2.4	2.6	2.8																																									

OR

6	a)	What are the major types of acceptance Sampling? Suggest the situation where you recommend these types of sampling.	L2	CO3	7 M
	b)	<p>An automobile company has a painting section. The number of defects were counted in an area of 1 metre by 1 metre of the chassis. The number of defects for the same area in different samples is listed as below. Suggest and plot the type of the chart and comment on it.</p> <p>No. of defectives - 0, 1, 5, 6, 4, 2, 8, 2, 1, 5, 3, 4, 6, 1, 0, 5, 7, 2, 6, 1</p>	L3	CO3	7 M

UNIT-IV

7	a)	<p>A time study was conducted on a job consisting of 3 elements. Stopwatch readings in minutes are given in the following table along with the rating factor. Calculate the average standard time if the allowance is 12%</p> <table border="1" style="width: 100%; border-collapse: collapse; margin: 10px 0;"> <thead> <tr> <th style="width: 15%;">Element</th> <th colspan="3" style="width: 40%;">Stop watch readings (min.)</th> <th style="width: 15%;">Performance rating</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">A</td> <td style="text-align: center;">10.1</td> <td style="text-align: center;">10.35</td> <td style="text-align: center;">10.42</td> <td style="text-align: center;">80%</td> </tr> <tr> <td style="text-align: center;">B</td> <td style="text-align: center;">24.20</td> <td style="text-align: center;">25.5</td> <td style="text-align: center;">24.80</td> <td style="text-align: center;">110%</td> </tr> <tr> <td style="text-align: center;">C</td> <td style="text-align: center;">15.25</td> <td style="text-align: center;">14.50</td> <td style="text-align: center;">15.50</td> <td style="text-align: center;">95%</td> </tr> </tbody> </table>	Element	Stop watch readings (min.)			Performance rating	A	10.1	10.35	10.42	80%	B	24.20	25.5	24.80	110%	C	15.25	14.50	15.50	95%	L3	CO4	7 M
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	b)	<p>Compare outline process chart and flow process chart with your own examples and diagrams.</p>	L3	CO4	7 M																				

OR

8	a)	<p>The worker in an engineering company is expected to work for 420 min in a shift of 8 hrs. The remaining time is allowed for the rest and personal needs etc.</p> <p>(i) Determine the standard time per piece of a job whose normal time is 4 min</p> <p>(ii) Calculate the number of pieces produced per day</p> <p>(iii) If the worker produced 100 pieces/shift, what is his efficiency?</p>	L3	CO4	7 M
	b)	<p>Draw the two-handed process chart for assembly of a nut and bolt.</p>	L3	CO4	7 M

UNIT-V

9	a)	<p>What is crashing in a project? Analyze the effect of crashing on overall time and the cost of the project.</p>	L3	CO5	7 M
	b)	<p>A textile industry has listed down the various activities involved in production of a new product. The details are given below.</p>	L3	CO5	7 M

		Activity duration (weeks)					
Activity	Optimistic time (t_o)	Most likely time (t_m)	Pessimistic time (t_p)				
1-2	2	3	10				
1-3	4	5	6				
1-4	3	3	4				
2-3	5	8	17				
3-5	2	3	16				
3-6	5	7	15				
4-5	3	6	15				
6-7	3	6	9				
5-8	3	4	5				
7-8	6	9	18				

(i) Construct the network diagram (ii) identify the critical path and its duration

OR

10	a)	Differentiate between CPM and PERT. Which one do you recommend for defense projects?	L3	CO5	7 M																														
	b)	<p>The following table presents a set of activities of a project. i) Draw the project network, ii) Determine critical path, iii) Find Project duration, iv) Calculate total float value of activity A.</p> <table border="1" style="margin-left: 40px;"> <thead> <tr> <th>Activity</th> <th>Nodes</th> <th>Duration (Days)</th> </tr> </thead> <tbody> <tr><td>A</td><td>1-2</td><td>3</td></tr> <tr><td>B</td><td>1-3</td><td>4</td></tr> <tr><td>C</td><td>1-4</td><td>14</td></tr> <tr><td>D</td><td>2-3</td><td>10</td></tr> <tr><td>E</td><td>2-6</td><td>5</td></tr> <tr><td>F</td><td>3-5</td><td>4</td></tr> <tr><td>G</td><td>3-6</td><td>6</td></tr> <tr><td>H</td><td>4-5</td><td>1</td></tr> <tr><td>I</td><td>5-6</td><td>1</td></tr> </tbody> </table>	Activity	Nodes	Duration (Days)	A	1-2	3	B	1-3	4	C	1-4	14	D	2-3	10	E	2-6	5	F	3-5	4	G	3-6	6	H	4-5	1	I	5-6	1	L3	CO5	7 M
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