

## IV B.Tech. I Semester MODEL QUESTION PAPER

## UNIVERSAL HUMAN VALUES-2: UNDERSTANDING HARMONY

(Common to AIDS, CSBS, CSE, IT &amp; ME)

Time: 3 Hrs

Max. Marks: 70 M

Answer **ONE** Question from **EACH** UNIT

All questions carry equal marks

			CO	KL	M
<b>UNIT-I</b>					
1.	a).	Discuss natural acceptance.	1	2	7
	b).	Differentiate prosperity and deprivation.	1	2	7
<b>OR</b>					
2.	a).	Write a note on physical facilities.	1	2	7
	b).	Deliberate the right understanding in perspective to self-exploration.	1	2	7
<b>UNIT-II</b>					
3.	a).	Illustrate coexistence of "I" and "Body".	2	2	7
	b).	Explain doer, seer and enjoyer.	2	2	7
<b>OR</b>					
4.	a).	Discuss Characteristic activities of Harmony with "I".	2	2	7
	b).	Explain Sanyam and Health.	2	2	7
<b>UNIT-III</b>					
5.	a).	Write a note on human-human relationship as regarding harmony.	3	2	7
	b).	Differentiate intention and competence.	3	2	7
<b>OR</b>					
6.	a).	Discuss salient values in relationship.	3	2	7
	b).	Illustrate universal Harmonious Society - an Undivided society.	3	2	7
<b>UNIT-IV</b>					
7		Discuss orders of life in nature and its significance self-regulation of individual.	4	2	14
<b>OR</b>					
8.		Illustrate existence of human being as coexistence with universe in perspective of space.	4	2	14
<b>UNIT-V</b>					
9.		Discuss importance of professional competence for augmenting universal human order.	5	3	14
<b>OR</b>					

<b>10.</b>	<b>a).</b>	Case study of typical holistic technologies.	<b>5</b>	<b>3</b>	<b>7</b>
	<b>b).</b>	Role of engineer in promoting harmony in society.	<b>5</b>	<b>3</b>	<b>7</b>
		<b>CO-COURSE OUTCOME</b>	<b>KL-KNOWLEDGE LEVEL</b>		<b>M-MARKS</b>

NOTE : Questions can be given as A,B splits or as a single Question for 14 marks



## IV B.Tech. I Semester MODEL QUESTION PAPER

## FINITE ELEMENT ANALYSIS

## Mechanical Engineering

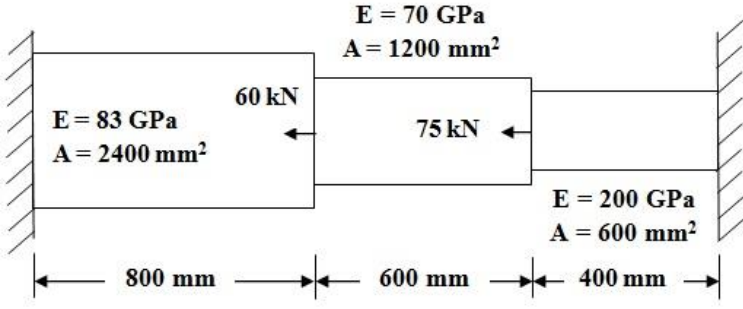
Time: 3 Hrs

Max. Marks: 70 M

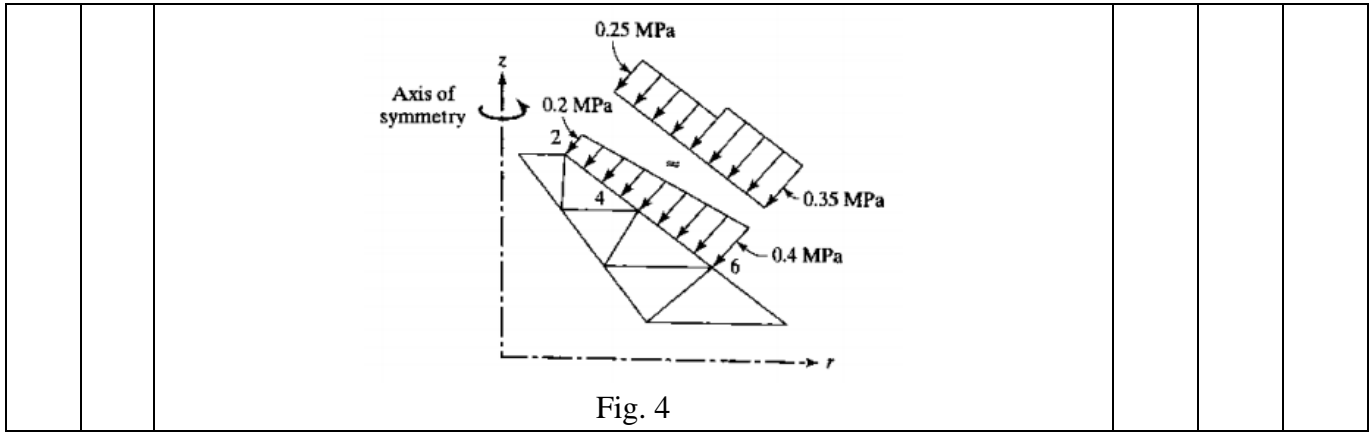
Answer ONE Question from EACH UNIT

All questions carry equal marks

Assume suitable data if necessary

			CO	KL	M
<b>UNIT-I</b>					
1.	a).	Derive the stress and strain relations for a 3D system.	1	3	7
	b).	List the applications of Finite Element Analysis	1	2	7
<b>OR</b>					
2.	a).	Discuss in detail about the general procedure of FEM formulation with an example.	1	2	7
	b).	Discuss in detail about plane stress and plane strain conditions.	1	3	7
<b>UNIT-II</b>					
3.		<p>Consider the bar as shown in Fig. 1 is subjected to a temperature difference of 600C. Determine the nodal displacements and stresses induced in the elements. Take the coefficient of thermal expansions as <math>18.9 \times 10^{-6}/0C</math> (for <math>E=83GPa</math> element), <math>18.9 \times 10^{-6}/0C</math> (for <math>E=70GPa</math> element) and <math>11.7 \times 10^{-6}/0C</math> (for <math>E=200GPa</math> element) respectively.</p>  <p style="text-align: center;">Fig. 1</p>	2	4	14
<b>OR</b>					
4.		Derive the elemental stiffness matrix for one dimensional quadratic bar element.	2	3	14
<b>UNIT-III</b>					
5.		For the two-bar truss shown in Fig. 2, determine the displacements of node 1 and the stress in element 1-3.	3	4	14

		<p>Fig. 2</p>			
		<b>OR</b>			
6		A beam of 10 m length is fixed at one end and supported by a roller at the other end has a 20 KN concentrated load applied at the centre of the span. Calculate the deflection under the load. Assume $E = 20 \times 10^5$ N/mm <sup>2</sup> and $I = 2500$ cm <sup>4</sup> .	3	4	14
		<b>UNIT-IV</b>			
7.		<p>For the triangular plate shown in Fig. 3, determine the deflection at the point of load application and also stress induced in the plate using a one element model by considering it as plane stress problem.</p> <p>Fig. 3</p>	4	4	14
		<b>OR</b>			
8.	a).	Derive the shape functions for the following higher order elements (i) Nine Nodded Quadrilateral Element (ii) Eight Nodded Quadrilateral Element	4	3	7
	b).	Evaluate $\int_{-1}^1 [3e^x + x^2 + \frac{1}{(x+2)}] dx$ integral using one point and two point Gauss quadrature formulae and compare the results with exact solution.	4	3	7
		<b>UNIT-V</b>			
9.		Derive the elemental stiffness matrix for 3noded triangular axi symmetric element.	5	3	14
		<b>OR</b>			
10.		An axi-symmetric body with a linearly distributed load on the conical surface is shown in Fig. 4. Determine the equivalent point loads at node 2 (60, 40), 4 (40, 55) and 6 (20, 70).	5	4	14



CO-COURSE OUTCOME

KL-KNOWLEDGE LEVEL

M-MARKS

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## IV B.Tech. I Semester MODEL QUESTION PAPER

## PRODUCTON PLANNING AND CONTROL

## Mechanical Engineering

Time: 3 Hrs.

Answer ONE Question from EACH UNIT

All questions carry equal marks

Assume suitable data if necessary

			CO	KL	M																						
<b>UNIT-I</b>																											
1.	a).	What is PPC? what is the need for PPC?	1	2	7																						
	b).	Discuss the objectives of production control.	1	2	7																						
<b>OR</b>																											
2.	a).	Explain organization of production planning and control department.	1	2	14																						
<b>UNIT-II</b>																											
3.	a).	What are the types of forecasting? Explain exponential smoothing method	2	3	7																						
	b).	Write the advantages of forecasting	2	2	7																						
<b>OR</b>																											
4.	a).	Using the exponential smoothing technique, Compute the forecasts from the following data (time series) under the situations when $\alpha = 0.7$ . Compute the forecast for the 11th period?	2	3	7																						
		<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Month</th> <th>1</th> <th>2</th> <th>3</th> <th>4</th> <th>5</th> <th>6</th> <th>7</th> <th>8</th> <th>9</th> <th>10</th> </tr> </thead> <tbody> <tr> <td>Demand</td> <td>29</td> <td>30</td> <td>32</td> <td>31</td> <td>27</td> <td>26</td> <td>30</td> <td>33</td> <td>32</td> <td>31</td> </tr> </tbody> </table>	Month	1	2	3	4	5	6	7	8	9	10	Demand	29	30	32	31	27	26	30	33	32	31			
Month	1	2	3	4	5	6	7	8	9	10																	
Demand	29	30	32	31	27	26	30	33	32	31																	
	b).	Explain qualitative method and quantitative methods	2	2	7																						
<b>UNIT-III</b>																											
5.	a).	What are the advantages of inventory control? What are the symptoms of poor inventory control	3	2	7																						
	b).	Explain the significance of EOQ formula. What are its Limitations?	3	3	7																						
<b>OR</b>																											
6.	a).	What is meant by VED analysis? What is its significance?	3	2	7																						
	b).	Explain in detail about MRP-I	3	3	7																						
<b>UNIT-IV</b>																											
7.	a).	Explain about BOM with a suitable example	4	3	7																						
	b).	Explain the procedure involved in route sheet preparation.	4	3	7																						
<b>OR</b>																											

<b>8.</b>	<b>a).</b>	What is line balancing? What is its importance in PPC? Explain it with an example.	<b>4</b>	<b>3</b>	<b>7</b>
	<b>b).</b>	Explain about anyone scheduling policy.	<b>4</b>	<b>3</b>	<b>7</b>
<b>UNIT-V</b>					
<b>9.</b>	<b>a).</b>	Briefly explain dispatching rules	<b>5</b>	<b>3</b>	<b>7</b>
	<b>b).</b>	Describe dispatching control in intermittent production and continuous production.	<b>5</b>	<b>3</b>	<b>7</b>
<b>OR</b>					
<b>10.</b>	<b>a).</b>	Discuss in details the sequential steps involved in dispatching	<b>5</b>	<b>3</b>	<b>7</b>
	<b>b).</b>	Explain the role of computers in PPC.	<b>5</b>	<b>3</b>	<b>7</b>

**CO-COURSE OUTCOME**

**KL-KNOWLEDGE LEVEL**

**M-MARKS**

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## IV B.Tech. I Semester MODEL QUESTION PAPER

## INDUSTRIAL ROBOTICS

## Mechanical Engineering

Time: 3 Hrs.

Max. Marks: 70 M

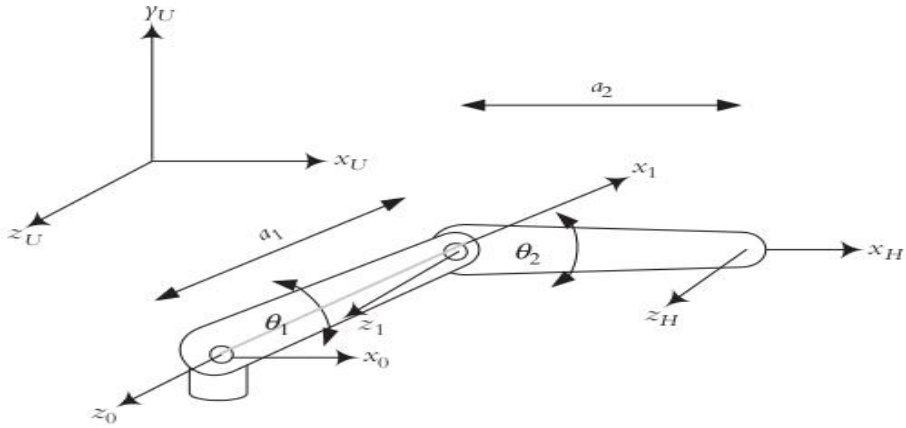
Answer **ONE Question** from **EACH UNIT**

All questions carry equal marks

Assume suitable data if necessary

			CO	KL	M
		<b>UNIT-I</b>			
<b>1.</b>	<b>a).</b>	Explain various components of robot.	<b>1</b>	<b>2</b>	<b>7</b>
	<b>b).</b>	Discuss applications of robot in brief.	<b>1</b>	<b>2</b>	<b>7</b>
		<b>OR</b>			
<b>2.</b>	<b>a).</b>	Explain working principle of encoders.	<b>1</b>	<b>2</b>	<b>7</b>
	<b>b).</b>	Classify and compare various types of actuation systems.	<b>1</b>	<b>2</b>	<b>7</b>
		<b>UNIT-II</b>			
<b>3.</b>	<b>a).</b>	Determine the new location of point $P(1, 2, 3)^T$ relative to the reference frame after a rotation of $30^\circ$ about the z-axis followed by a rotation of $60^\circ$ about the y-axis.	<b>2</b>	<b>3</b>	<b>7</b>
	<b>b).</b>	A frame B is rotated $90^\circ$ about the z-axis, then translated 3 and 5 units relative to the n- and o-axes respectively, then rotated another $90^\circ$ about the n-axis, and finally, $90^\circ$ about the y-axis. Calculate the new location and orientation of the frame.  $B = \begin{bmatrix} 0 & 1 & 0 & 1 \\ 1 & 0 & 0 & 1 \\ 0 & 0 & -1 & 1 \\ 0 & 0 & 0 & 1 \end{bmatrix}$	<b>2</b>	<b>3</b>	<b>7</b>
		<b>OR</b>			
<b>4.</b>	<b>a).</b>	Suppose that a robot is made of a Cartesian and <i>RPY</i> combination of joints. Find the necessary <i>RPY</i> angles to achieve the following:  $T = \begin{bmatrix} 0.527 & -0.574 & 0.628 & 4 \\ 0.369 & 0.819 & 0.439 & 6 \\ -0.766 & 0 & 0.643 & 9 \\ 0 & 0 & 0 & 1 \end{bmatrix}$	<b>2</b>	<b>3</b>	<b>7</b>
	<b>b).</b>	Also, solve for the Euler angles for the above matrix	<b>2</b>	<b>3</b>	<b>7</b>
		<b>UNIT-III</b>			
<b>5.</b>	<b>a).</b>	Explain the concept of DH notation with a general case of a robot joint.	<b>3</b>	<b>2</b>	<b>8</b>



	<p>b). Obtain the DH parameters and derive the forward kinematics equation for a RR robot shown below.</p> 	3	3	6
<b>OR</b>				
6.	<p>a). In the 2-DOF robot, the transformation matrix <math>{}^0T_H</math> is given in symbolic form, as well as in numerical form for a specific location. The length of each link <math>l_1</math> and <math>l_2</math> is 1 unit. Solve the values of <math>\theta_1</math> and <math>\theta_2</math> for the given location.</p> ${}^0T_H = \begin{bmatrix} C_{12} & -S_{12} & 0 & l_2 C_{12} + l_1 C_1 \\ S_{12} & C_{12} & 0 & l_2 S_{12} + l_1 S_1 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix} = \begin{bmatrix} -0.2924 & -0.9563 & 0 & 0.6978 \\ 0.9563 & -0.2924 & 0 & 0.8172 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}$	3	3	7
	<p>b). Suppose the location and orientation of a hand frame is expressed by the following matrix. What is the effect of a differential rotation of 0.15 radians about the z-axis, followed by a differential translation of [0.1, 0.1, 0.3]? Find the new location of the hand.</p> ${}^R T_H = \begin{bmatrix} 0 & 0 & 1 & 2 \\ 1 & 0 & 0 & 7 \\ 0 & 1 & 0 & 5 \\ 0 & 0 & 0 & 1 \end{bmatrix}$	3	3	7
<b>UNIT-IV</b>				
7.	<p>Joint 1 of the 6-axis robot is to go from initial angle of <math>\theta_i = 30^\circ</math> to the final angle of <math>\theta_f = 75^\circ</math> in 5 seconds with a cruising velocity of <math>\omega_1 = 10^\circ/\text{sec}</math>. Find the necessary time for blending and plot the joint positions, velocities, and accelerations.</p>	4	3	14
<b>OR</b>				
8.	<p>Using the Lagrangian method, derive the equations of motion for the 2-DOF robot arm, as shown in Figure below. The center of mass for each link is at the center of the link. The moments of inertia are <math>I_1</math> and <math>I_2</math>.</p>	4	3	14

		<b>UNIT-V</b>			
9.	a).	Determine the motion of the system shown below if the parameter values are $m = 1$ , $b = 5$ , and $k = 6$ and the block is released from rest from a position $x = -1$ . 	5	3	7
	b).	Explain the concept of control law partitioning with the help of block diagram	5	2	7
		<b>OR</b>			
10	a).	Analyze the stability of a linear spring mass damper system using Lyapunov method	5	4	7
	b).	Develop the block diagram for model based control for nonlinear control of manipulator	5	3	7

CO-COURSE OUTCOME

KL-KNOWLEDGE LEVEL

M-MARKS

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## IV B.Tech. I Semester MODEL QUESTION PAPER

## QUALITY CONTROL AND ASSURANCE

## Mechanical Engineering

Time: 3 Hrs.

Max. Marks: 70 M

Answer ONE Question from EACH UNIT

All questions carry equal marks

Assume suitable data if necessary

			CO	KL	M																																				
		<b>UNIT-I</b>																																							
1.	a).	What do you mean by quality, quality of conformance and quality of performance?	1	2	7																																				
	b).	What is Deming's philosophy? Explain	1	2	7																																				
		<b>OR</b>																																							
2.	a).	Explain Quality Cost and Statistical Quality Control?	1	2	7																																				
	b).	Explain warning limits with neat diagrams?	1	2	7																																				
		<b>UNIT-II</b>																																							
3.	a).	State the objectives of $\bar{x}$ and R	2	2	7																																				
	b).	<p>Prepare - R charts using the following measurements of surface roughness taken of 5 rough turned pieces. On each piece 5 measurements are taken along its length. These pieces have been picked up randomly from a lot of 50.</p> <p>Sample Five measurements per sample (x)</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th></th> <th>1</th> <th>2</th> <th>3</th> <th>4</th> <th>5</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>10.5</td> <td>10.17</td> <td>10.16</td> <td>10.18</td> <td>10.16</td> </tr> <tr> <td>2</td> <td>10.17</td> <td>10.19</td> <td>10.14</td> <td>10.11</td> <td>10.17</td> </tr> <tr> <td>3</td> <td>10.16</td> <td>10.14</td> <td>10.15</td> <td>10.17</td> <td>10.15</td> </tr> <tr> <td>4</td> <td>10.19</td> <td>10.18</td> <td>10.17</td> <td>10.15</td> <td>10.16</td> </tr> <tr> <td>5</td> <td>10.14</td> <td>10.16</td> <td>10.15</td> <td>10.14</td> <td>10.17</td> </tr> </tbody> </table> <p>State whether the processes under control or not</p>		1	2	3	4	5	1	10.5	10.17	10.16	10.18	10.16	2	10.17	10.19	10.14	10.11	10.17	3	10.16	10.14	10.15	10.17	10.15	4	10.19	10.18	10.17	10.15	10.16	5	10.14	10.16	10.15	10.14	10.17	2	3	7
	1	2	3	4	5																																				
1	10.5	10.17	10.16	10.18	10.16																																				
2	10.17	10.19	10.14	10.11	10.17																																				
3	10.16	10.14	10.15	10.17	10.15																																				
4	10.19	10.18	10.17	10.15	10.16																																				
5	10.14	10.16	10.15	10.14	10.17																																				
		<b>OR</b>																																							
4.	a).	What is group control chart? Explain the procedure for plotting control limits on group control chart	2	2	7																																				
	b).	An auto mobile part has to conform to the specification of $5.0 \pm 0.15$ , failing which it must be scrapped. The data gathered by the quality control department as follows : $n=5$ ; number of samples =20 , $\Sigma X=100.2, \Sigma \sigma=4.8$ Setup the $\bar{X}$ and $\sigma$ control charts. Assuming that the process is under control, what percentage of the total parts produced actually fell out side the specification limits?	2	3	7																																				

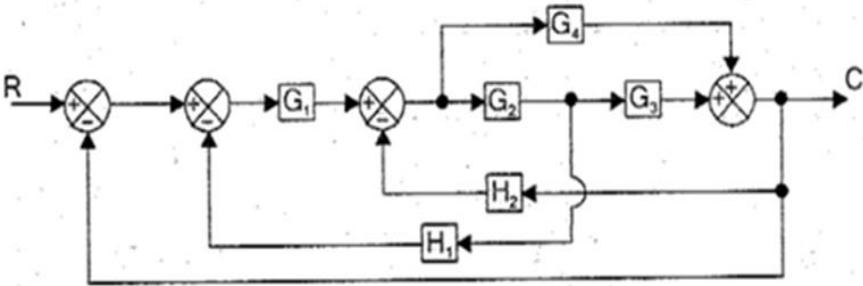
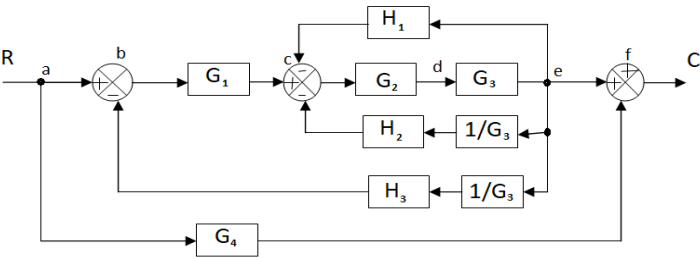
<b>UNIT-III</b>																				
<b>5.</b>	<b>a).</b>	Explain defect, defective and fraction defective?	<b>3</b>	<b>2</b>	<b>7</b>															
	<b>b).</b>	Twenty pieces of cloth out of different rolls contained respectively 1, 4, 3, 2, 5, 4, 6, 7, 2, 3, 2, 5, 7, 6, 4, 5, 2, 1, 3 and 8 defects. As certain whether the process is in a state of quality control	<b>3</b>	<b>3</b>	<b>7</b>															
<b>OR</b>																				
<b>6.</b>	<b>a).</b>	Explain demerit control chart?	<b>3</b>	<b>2</b>	<b>7</b>															
	<b>b).</b>	In the following table refer to the competition of mean and variance for 30 ideal telephone assemblies with four classes of defectives <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Class of defectives</th> <th>Weight</th> <th>No of Defects</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>0.64</td> <td>5</td> </tr> <tr> <td>2</td> <td>0.25</td> <td>15</td> </tr> <tr> <td>3</td> <td>0.08</td> <td>75</td> </tr> <tr> <td>4</td> <td>0.02</td> <td>50</td> </tr> </tbody> </table> Establish is center line, UCL, LCL on demerit on troll chart	Class of defectives	Weight	No of Defects	1	0.64	5	2	0.25	15	3	0.08	75	4	0.02	50	<b>3</b>	<b>3</b>	<b>7</b>
Class of defectives	Weight	No of Defects																		
1	0.64	5																		
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4	0.02	50																		
<b>UNIT-IV</b>																				
<b>7.</b>	<b>a).</b>	Explain process capability analysis?	<b>4</b>	<b>2</b>	<b>7</b>															
	<b>b).</b>	The design specifications for a component are $100 \pm 0.5$ mm, whereas the process report shows that average price average is 99.9MM and standard deviation is 0.18. Does this figure call for any action by anyone? What action is necessary and by whom?	<b>4</b>	<b>3</b>	<b>7</b>															
<b>OR</b>																				
<b>8.</b>	<b>a).</b>	Explain how do you determine process capability?	<b>4</b>	<b>2</b>	<b>7</b>															
	<b>b).</b>	Explain smaller the better type and larger the better type?	<b>4</b>	<b>2</b>	<b>7</b>															
<b>UNIT-V</b>																				
<b>9.</b>	<b>a).</b>	Explain Single sampling plan with an eat schematic?	<b>5</b>	<b>2</b>	<b>7</b>															
	<b>b).</b>	Derive the OC curve and AOQ curve of single sampling plan $N=1000$ , $n=100$ , $C=3$	<b>5</b>	<b>3</b>	<b>7</b>															
<b>OR</b>																				
<b>10.</b>	<b>a).</b>	Explain Sequential sampling plan.	<b>5</b>	<b>2</b>	<b>7</b>															
	<b>b).</b>	Design a single sampling by attributes plan which will meet or nearly meet the following requirements $\alpha=0.05$ , $\beta=0.05$ , $P_1=0.02$ , $P_2=0.08$	<b>5</b>	<b>3</b>	<b>7</b>															

CO-COURSE OUTCOME

KL-KNOWLEDGE LEVEL

M-MARKS

NOTE : Questions can be given as A,B splits or as a single Question for 14 marks

		Course Code: B20ME4106			
		SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)		R20	
IV B.Tech. I Semester MODEL QUESTION PAPER					
CONTROL SYSTEMS					
Mechanical Engineering					
Time: 3 Hrs.		Max. Marks: 70 M			
Answer ONE Question from EACH UNIT					
All questions carry equal marks					
Assume suitable data if necessary					
			CO	KL	M
<b>UNIT-I</b>					
1.	a).	Define control system and distinguish between open loop and closed loop systems.	1	2	7
	b).	Find the overall transfer function of the block diagram shown in Fig. 1.	1	3	7
					
		Fig. 1			
<b>OR</b>					
2.		Convert the block diagram shown in Fig.2 to signal flow graph and find the transfer function of the system?	1	3	14
					
		Fig. 2			
<b>UNIT-II</b>					
3.		Write the differential equations governing the mechanical system shown in the below Fig. 3 and draw force–voltage and force-current analogous circuit for the same mechanical system.	2	3	14

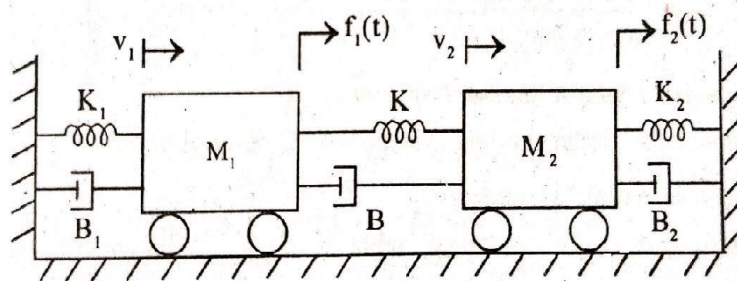


Fig. 3

OR

Find the differential equations governing the mechanical system shown in below Fig. 4.

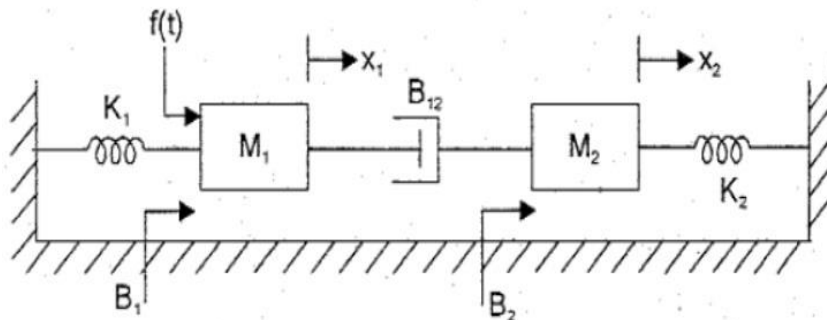


Fig. 4

4. 2 3 14

UNIT-III

5. Construct state-space model for a feedback system whose closed loop transfer function is given as,  $\frac{Y(s)}{U(s)} = \frac{10(s+4)}{s(s+1)(s+3)}$  3 3 14

OR

6. Given that  $A_1 = \begin{bmatrix} \sigma & 0 \\ 0 & \sigma \end{bmatrix}$ ;  $A_2 = \begin{bmatrix} 0 & \omega \\ -\omega & 0 \end{bmatrix}$ ;  $A = \begin{bmatrix} \sigma & \omega \\ -\omega & \sigma \end{bmatrix}$  calculate  $e^{At}$ . 3 3 14

UNIT-IV

7. A unity feedback system is characterized by an open loop transfer function  $G(s) = \frac{K}{s(s+1)}$ . Determine the gain K, so that the system will have a damping ratio of 0.5 for this value of K. Determine settling time, peak overshoot and time at peak overshoot for a unit step input. 4 3 14

OR

8. A unity feedback system has  $G(s) = \frac{K}{s(s+1)(0.1s+1)}$  and  $r(t)=10t$ ; find static error constants ( $K_p$ ,  $K_v$  and  $K_a$ ) and determine  $e_{ss}(t)$ . 4 3 14

UNIT-V

9. Using Routh array, determine the stability of system represented by characteristic equation  $S^6+S^5+5S^4+3S^3+2S^2-4S-8=0$  5 3 14

OR

10.	Draw Nyquist plot for a system whose open loop transfer function is given below and also determine the range of K for which closed loop system is stable. $G(s) = \frac{15}{s(s+1)(s+2)(s+3)}$	5	3	14
CO-COURSE OUTCOME		KL-KNOWLEDGE LEVEL		M-MARKS

NOTE : Questions can be given as A,B splits or as a single Question for 14 marks



## IV B.Tech. I Semester MODEL QUESTION PAPER

## UNCONVENTIONAL MACHINING PROCESSES

## Mechanical Engineering

Time: 3 Hrs.

Max. Marks: 70 M

Answer ONE Question from EACH UNIT

All questions carry equal marks

			CO	KL	M
<b>UNIT-I</b>					
1.	a).	How the modern machining process are classified based on source of energy, and shapes to be machined?	1	2	7
	b).	Explain the merits and demerits of Unconventional machining process over the traditional machining process.	1	3	7
<b>OR</b>					
2.	a).	Compare and contrast the various unconventional machining process based on type of energy employed, material removal rate, transfer media and economical aspects.	1	3	7
	b).	Explain under what circumstances the unconventional machining process is considered for machining.	1	2	7
<b>UNIT-II</b>					
3.	a).	List out the five important variables of AJM process. Draw a sketch showing the effect of these variables on MRR.	2	3	7
	b).	Describe any three typical engineering applications of AWJM and WJM.	2	3	7
<b>OR</b>					
4.	a).	Explain the working principle of the USM process with a neat sketch and list out its applications.	2	3	7
	b).	List out the applications, merits and demerits of USM process.	2	3	7
<b>UNIT-III</b>					
5.	a).	Explain the function of dielectric fluid in EDM. Name the common dielectric fluids used in EDM.	3	3	7
	b).	Explain the principle of Wire EDM with suitable diagram.	3	3	7
<b>OR</b>					
6.	a).	Discuss the advantages of EDM as compared to other non-traditional methods regarding (i) Metal removed rate (ii) Accuracy and Surface finish.	3	3	7
	b).	Explain the factors influencing the selection of tool material for electrode.	3	3	7



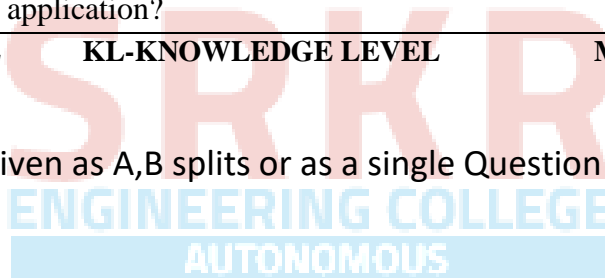
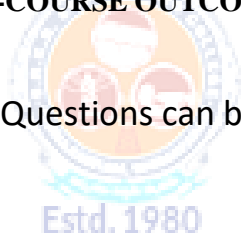
<b>UNIT-IV</b>					
<b>7.</b>	<b>a).</b>	Discuss about the generation of laser during LBM process and their merits and demerits.	<b>4</b>	<b>3</b>	<b>7</b>
	<b>b).</b>	Explain the working of Plasma Arc Machining and its applications with a neat sketch	<b>4</b>	<b>3</b>	<b>7</b>
<b>OR</b>					
<b>8.</b>	<b>a).</b>	Explain the working principle of Laser beam machining with a neat sketch	<b>4</b>	<b>3</b>	<b>7</b>
	<b>b).</b>	Explain the process of Magnetic abrasive finishing with a neat sketch.	<b>4</b>	<b>3</b>	<b>7</b>
<b>UNIT-V</b>					
<b>9.</b>	<b>a).</b>	Sketch and explain electro chemical honing process.	<b>5</b>	<b>3</b>	<b>7</b>
	<b>b).</b>	Explain the electro chemical machining process with a neat sketch	<b>5</b>	<b>3</b>	<b>7</b>
<b>OR</b>					
<b>10.</b>	<b>a).</b>	Explain the working principle of chemical machining with neat sketch.	<b>5</b>	<b>3</b>	<b>7</b>
	<b>b).</b>	What are the various factors to be considered in the selection of Etchants for a particular application?	<b>5</b>	<b>3</b>	<b>7</b>

**CO-COURSE OUTCOME**

**KL-KNOWLEDGE LEVEL**

**M-MARKS**

NOTE : Questions can be given as A,B splits or as a single Question for 14 marks



## IV B.Tech. I Semester MODEL QUESTION PAPER

## AUTOMOBILE ENGINEERING

## Mechanical Engineering

Time: 3 Hrs.

Max. Marks: 70 M

Answer ONE Question from EACH UNIT

All questions carry equal marks

			CO	KL	M
<b>UNIT-I</b>					
1.	a).	What are the components of an automobile? Explain some of them?	1	2	7
	b).	Define chassis. List the components of chassis and discuss very briefly about each component.	1	2	7
<b>OR</b>					
2.	a).	With the help of block diagram, explain the petrol injection system in S.I. Engine	1	2	7
	b).	Write a short note on Conventional, CRDI and dual fuel engines.	1	2	7
<b>UNIT-II</b>					
3.	a).	Explain the principle of a clutch. Discuss its importance.	2	3	7
	b).	Explain constant mesh gearbox with a neat sketch.	2	3	7
<b>OR</b>					
4.	a).	Explain Automatic Gear box?	2	2	8
	b).	Differentiate between CVT and Epicyclical gear box?	2	2	6
<b>UNIT-III</b>					
5.	a).	Explain the Ackermann Steering mechanism with neat sketch	3	3	10
	b).	List the advantages and disadvantages of automatic transmission.	3	3	4
<b>OR</b>					
6.	a).	What is meant by Wheel alignment? Write short notes on Caster and Camber?	3	3	7
	b).	Differentiate between tube and tubeless tires.	3	3	7
<b>UNIT-IV</b>					
7.	a).	Explain the working of hydraulic brake system with neat diagram	4	2	7
	b).	What is meant by brake bleeding? Explain it	4	2	7
<b>OR</b>					
8.	a).	List the various pollutants from the automobile. List the various technologies used to control them.	4	2	7
	b).	Write a short notes on Starting system and ECU	4	2	7

		<b>UNIT-V</b>			
<b>9.</b>	<b>a).</b>	What are the advantages and disadvantages of hybrid vehicles when compared with normal vehicles?	<b>5</b>	<b>3</b>	<b>7</b>
	<b>b).</b>	How do you find degree of hybridization of vehicle.	<b>5</b>	<b>3</b>	<b>7</b>
		<b>OR</b>			
<b>10.</b>	<b>a).</b>	List out the several causes for Re boring Cylinder	<b>5</b>	<b>2</b>	<b>7</b>
	<b>b).</b>	Explain about periodic and preventive maintenance	<b>5</b>	<b>2</b>	<b>7</b>
		<b>CO-COURSE OUTCOME</b>	<b>KL-KNOWLEDGE LEVEL</b>	<b>M-MARKS</b>	

NOTE : Questions can be given as A,B splits or as a single Question for 14 marks



## IV B.Tech. I Semester MODEL QUESTION PAPER

## ADDITIVE MANUFACTURING

## Mechanical Engineering

Time: 3 Hrs.

Max. Marks: 70 M

Answer ONE Question from EACH UNIT

All questions carry equal marks

			CO	KL	M
<b>UNIT-I</b>					
1.	a).	Describe the Generic process of CAD to part	1	2	7
	b).	Preparation of CAD model in additive manufacturing.	1	2	7
<b>OR</b>					
2.	a).	Briefly explain the generalized AM process chain.	1	2	7
	b).	Discuss the file format used in additive manufacturing	1	2	7
<b>UNIT-II</b>					
3.	a).	Illustrate the working principal of Stereo Lithography apparatus.	2	3	7
	b).	Explain the path generation in fusion decomposition modeling (FDM).	2	3	7
<b>OR</b>					
4.	a).	Explain the limitations and applications of liquid based AM.	2	3	7
	b).	List out the applications, advantages and disadvantages of laminated object manufacturing (LOM)?	2	2	7
<b>UNIT-III</b>					
5.	a).	Explain with a neat sketch the working principle of Selective Laser Sintering process.	3	3	7
	b).	Explain the steps involved in post processing technique in AM	3	3	7
<b>OR</b>					
6.	a).	Describe the working principle with benefits and limitations of Electron beam melting	3	3	7
	b).	Explain the techniques used to enhance mechanical properties for AM parts	3	3	7
<b>UNIT-IV</b>					
7.	a).	Describe how reverse engineering will be applied to rapid proto typing technique.	4	3	7
	b).	Discuss various materials available for AM.	4	2	7
<b>OR</b>					
8.	a).	Explain the steps involved in reverse engineering.	4	3	7
	b).	Explain about ceramic tooling process.	4	3	7

		<b>UNIT-V</b>			
<b>9.</b>	<b>a).</b>	Differentiate direct and indirect rapid tooling method.	<b>5</b>	<b>3</b>	<b>7</b>
	<b>b).</b>	Explain the process of 3D keltool in brief.	<b>5</b>	<b>3</b>	<b>7</b>
		<b>OR</b>			
<b>10.</b>	<b>a).</b>	Explain the process of RTV epoxy tooling. Write advantages, disadvantages and applications of it.	<b>5</b>	<b>3</b>	<b>7</b>
	<b>b).</b>	Write the applications of additive manufacturing in automotive and aerospace industries	<b>5</b>	<b>2</b>	<b>7</b>
		<b>CO-COURSE OUTCOME</b>	<b>KL-KNOWLEDGE LEVEL</b>	<b>M-MARKS</b>	

NOTE : Questions can be given as A,B splits or as a single Question for 14 marks



## IV B.Tech. I Semester MODEL QUESTION PAPER

## POWER PLANT ENGINEERING

## Mechanical Engineering

Time: 3 Hrs.

Max. Marks: 70 M

Answer ONE Question from EACH UNIT

All questions carry equal marks

Assume suitable data if necessary

			CO	KL	M
<b>UNIT-I</b>					
1.	a).	Explain about the steam power plant layout with neat sketch	1	2	7
	b).	Explain about the coal handling systems in detail.	1	2	7
<b>OR</b>					
2.	a).	Explain about the multi retort stokers with a neat sketch.	1	2	7
	b).	Explain about the types of dust collectors with a neat sketch.	1	2	7
<b>UNIT-II</b>					
3.	a).	Describe briefly the layout of a diesel engine power plant.	2	2	7
	b).	Write a note on fuel system of diesel engine power plant.	2	2	7
<b>OR</b>					
4.	a).	What do you understand by an open cycle gas turbine plant? List out its advantages over closed cycle plant.	2	2	7
	b).	Why is power generation by gas turbines attractive?	2	2	7
<b>UNIT-III</b>					
5.	a).	Explain about the different types of dams.	3	3	7
	b).	Define run-off. List the factors which affect the run-off.	3	2	7
<b>OR</b>					
6.	a).	Illustrate various elements of a hydro electric power plant?	3	2	7
	b).	Write short notes on storage and pondage?	3	2	7
<b>UNIT-IV</b>					
7.	a).	Describe the working of a Fast Breeder reactor. What are its advantages?	4	2	7
	b).	What are the different radiation hazards? Explain some protection methods.	4	2	7
<b>OR</b>					
8.	a).	What are the different fuels used in nuclear reactors? Explain the need of breeding.	4	2	7

	<b>b).</b>	Explain with help of neat diagram the working of Boiling water reactor.	<b>4</b>	<b>2</b>	<b>7</b>
		<b>UNIT-V</b>			
<b>9.</b>	<b>a).</b>	What do you understand by power plant economics? Explain the fixed costs and operating costs of a power station.	<b>5</b>	<b>3</b>	<b>7</b>
	<b>b).</b>	Explain about the pollutants and other environmental effects caused by power plants.	<b>5</b>	<b>3</b>	<b>7</b>
		<b>OR</b>			
<b>10.</b>	<b>a).</b>	What is meant by load curve? What is its significance in power generation?	<b>5</b>	<b>3</b>	<b>7</b>
	<b>b).</b>	Define diversity factor and state the advantages of diversity factor in power system.	<b>5</b>	<b>2</b>	<b>7</b>

**CO-COURSE OUTCOME**

**KL-KNOWLEDGE LEVEL**

**M-MARKS**

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