

[B17 ME 4101]
IV B. Tech I Semester (R 17) Regular Examinations
HEAT TRANSFER
DEPARTMENT OF MECHANICAL ENGINEERING
MODEL QUESTION PAPER

TIME: 3Hrs.

Max. Marks:70

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

All questions carry equal marks.

UNIT-I			
1.	(a).	Explain the different modes of heat transfer with neat sketches. Write down the basic laws of heat transfer	7M
	(b).	A wire of 6mm diameter with 2mm thick insulation ($k=0.11\text{w/mk}$). If the convective heat transfer coefficient between the insulating surface and air is $25\text{w/m}^2\text{k}$. Analyse the critical thickness of insulation and also find the percentage of change in the heat transfer rate if the critical radius is used.	7M
(OR)			
2.	(a).	Explain an expression for Conduction of Heat through hollow sphere.	7M
	(b).	A composite insulating wall has three layer of material held together by 4cm diameter aluminum ($K=200\text{w/m-k}$) rivet per 0.1 m^2 of surface. The layer of materials consists of 12cm thick brick ($k= 0.90\text{w/mk}$) with hot surface at 220°C , 22cm thick timber ($k=0.110\text{w/mk}$) with cold surface at 15°C . These two layers are interposed by third layer of insulating material 1.5cm thick of conductivity 0.170w/mk . Analyze the percentage of increase in heat transfer rate due to rivet.	7M
UNIT-II			
3.	(a).	Explain about the Fin efficiency and Fin effectiveness.	7M
	(b).	A very long 1 cm diameter copper rod $k=377\text{W/mK}$ is exposed to an environment at 22°C .The base temperature of the rod is maintained at 150°C .The heat transfer coefficient between the rod and the surrounding air is $11\text{W/m}^2\text{K}$.Estimate the heat transfer rate from the rod to the surrounding air.	7M
(OR)			
4.	(a).	Explain the Biot and Fourier's numbers and their significance.	7M
	(b).	A large steel plate 5cm thick is initially at a uniform temperature of 400°C . It is suddenly exposed on both sides to a surrounding at 60°C with convective heat transfer co-efficient of $285\text{W/m}^2\text{K}$. Calculate the center line temperature and the temperature inside the plate 1.25cm from the plane after 3 minutes.	7M
UNIT-III			
5.	(a).	Classify the advantages and limitations of dimensional analysis.	7M
	(b).	Air at 20°C at atmospheric pressure flows over a flat plate at a velocity of 3m/s . If the plate is 1m wide and 80°C , Solve the following at $x = 300\text{mm}$. 1. Hydrodynamic boundary layer thickness, 2. Thermal boundary layer thickness, 3. Local friction coefficient, 4. Average friction coefficient, 5. Local heat transfer coefficient, 6. Average heat transfer coefficient, 7. Heat transfer.	7M
(OR)			
6.	(a).	Explain the temperature and velocity profiles in free convection on a vertical wall.	7M
	(b).	Solve the coefficient of heat transfer by free convection between a horizontal wire and air at 25°C . The surface of the wire is at 95°C and if diameter is 2.5 mm. Also find the maximum admissible current intensity if the resistance of the wire is 6 ohm/m .	7M

UNIT-IV			
7.	(a).	Categorize brief note on heat transfer during boiling and Condensation.	7M
	(b).	A 4 cm OD, 1m long tube is to be used to condense steam at atmospheric pressure. The water flows inside the tube maintaining the wall surface at 60 ⁰ C. Inspect the mass of condensate for the tube in (i) Horizontal position and (ii) Vertical position.	7M
(OR)			
8.	(a).	Compare the advantages of NTU method over the LMTD method of heat exchanger design.	7M
	(b).	Hot coil having a specific heat of 2.09kJ/kg-K flows through a counter flow heat exchanger at the rate of 2268kg/h with an inlet temperature of 93 ⁰ C and an outlet temperature of 65 ⁰ C. Cold oil having a specific heat of 1.67kJ/kg-K flows in at a rate of 3600kg/h and leaves at 149 ⁰ C. Examine the area is required to handle this load, if the overall heat transfer coefficient based on the inside area is 0.7 kW/m ² K.	7M
UNIT-V			
9.	(a).	Explain the Fick's first law of diffusion.	7M
	(b).	Two parallel plates of size 1.0 m x 1.0m spaced 0.5m apart are; ocated in very large room , the walls are maintained at a temperature of 27 ⁰ C one plate is maintained at a temperature of 900 ⁰ C and other at 400 ⁰ C their emissivity are 0.2 and 0.5 respectively. If the plate exchange heat themselves and surroundings, Solve the heat transfer to each plate and to them. Consider only the plate surface facing each other.	7M
(OR)			
10.	(a).	Explain the brief the concept of a black body.	7M
	(b).	A 60 mm thick plate with a circular hole of 30 mm diameter along the thickness is maintained at uniform temperature of 300 ⁰ C. Solve the loss of energy to the surroundings at 20 ⁰ C, assuming that the two ends of the hole to be as parallel discs and the metallic surfaces and surroundings have black body characteristics.	7M

[B17 ME 4101]

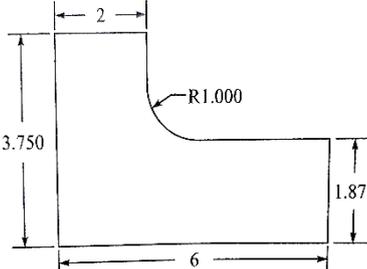
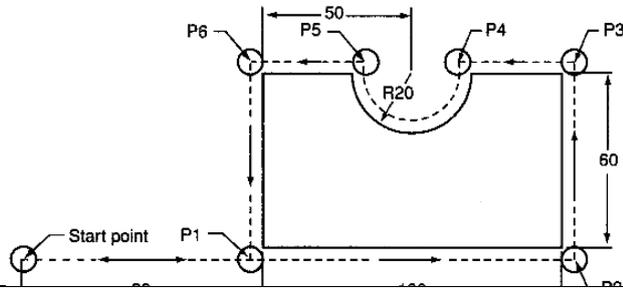
[B17 ME 4102]
IV B. Tech I Semester (R 17) Regular Examinations
COMPUTER AIDED MANUFACTURING
DEPARTMENT OF MECHANICAL ENGINEERING
MODEL QUESTION PAPER

TIME: 3Hrs.

Max. Marks:70

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

All questions carry equal marks.

UNIT-I		
1.	<p>(a). Differentiate between Numerical Control (NC), Computer Numerical Control (CNC) and Direct Numerical Control (DNC) systems of CAM</p> <p>(b). Prepare the manual part programme for the following part as shown below</p>	7M 7M
		
(OR)		
2.	<p>(a). Explain the Optiz coding system generally used in group technology.</p> <p>(b). Prepare the Computer Aided part programme for the following part as shown below</p>	7M 7M
		
UNIT-II		
3.	<p>(a). Compare the retrieval and generative CAPP systems</p> <p>(b). Explain about advantages & Disadvantages of CAPP</p>	7M 7M
(OR)		
4.	<p>(a). Apply the implementation techniques used for the generation of process plan.</p> <p>(b). Explain about Hybrid CAPP System</p>	7M 7M
UNIT-III		
5.	<p>(a). Illustrate the various parts of robot with a neat sketch</p> <p>(b). Sketch and Explain about 'Automated Guided Vehicle (AGV). Describe the role of sensors in controllers.</p>	7M 7M
(OR)		
6.	<p>(a). Choose the required considerations to be made for material handling system design</p> <p>(b). Explain about various Sensors used in robots</p>	7M 7M

UNIT-IV			
7.	(a).	Explain the working principle of a Machine vision with a neat sketch.	7M
	(b).	Distinguish between contact inspection and non-contact inspection methods	7M
(OR)			
8.	(a).	Explain the construction and working of coordinate measuring machine.	7M
	(b).	Compare between Online inspection and Offline inspection	7M
UNIT-V			
9.	(a).	Discuss the major elements of FMS?	7M
	(b).	Explain the Management systems used in FMS	7M
(OR)			
10.	(a).	Explain about Building blocks of FMS	7M
	(b).	Explain about Computer integrated manufacturing systems (CIMS).	7M

[B17 ME 4102]

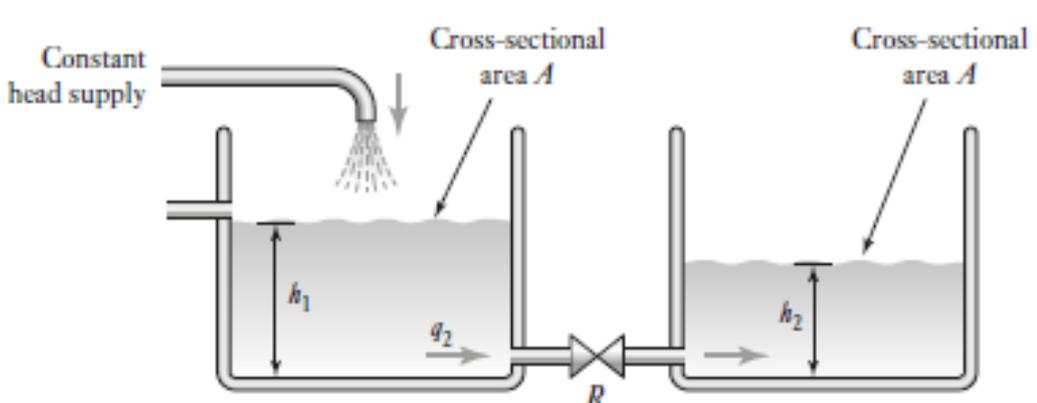
[B17 ME 4103]
 IV B. Tech I Semester (R 17) Regular Examinations
MECHATRONICS
 DEPARTMENT OF MECHANICAL ENGINEERING
 MODEL QUESTION PAPER

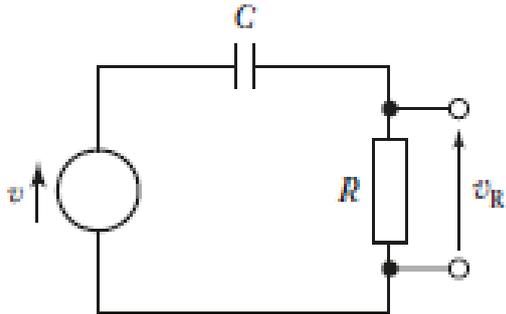
TIME: 3Hrs.

Max. Marks:70

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

All questions carry equal marks.

UNIT-I			
1.	(a).	What do you understand by the term Mechatronics? With a neat diagram, show the basic elements of a Mechatronic system. Give examples of Mechatronic systems.	7M
	(b).	Write short notes on i) proximity sensor and ii) hall effect sensor	7M
(OR)			
2.	(a).	Explain optical encoder and strain gauges.	7M
	(b).	Discuss integrating and differentiating amplifier.	7M
UNIT-II			
3.	(a).	What is direction control valve? Explain the operation of single solenoid valve.	7M
	(b).	What do you understand by the term Actuation system? With a neat schematic diagram, describe the construction and working of a Hydraulic system.	7M
(OR)			
4.	(a).	Explain digital to analog and analog to digital converters.	7M
	(b).	Draw ladder logic diagram of OR, NOR, and XOR logic.	7M
UNIT-III			
5.	(a).	What is the use of a mechanical switch? How does an electrical relay operate? Draw the relay drive circuit and explain its operation.	7M
	(b).	Write the working principle of stepper motor.	7M
(OR)			
6.	(a).	Derive the relationship between the height h_2 and time for the hydraulicsystem shown in Figure 1. Neglect inrtance. <div style="text-align: center; margin-top: 10px;">  <p style="text-align: center;">Figure 1</p> </div>	7M

	(b).	Derive the relationship between the output, the potential difference across the resistor R of v_R , and the input v for the circuit shown in Figure 2 which has a resistor in series with a capacitor.	7M
			
Figure 2			

UNIT-IV

7.	(a).	A first-order system has a time constant of 4 s and a steady-state transfer function of 6. What is the form of the differential equation for this system?	7M
	(b).	What is the overall transfer function for a closed-loop system having a forward-path transfer function of $5/(s+3)$ and a negative feedback-path transfer function of 10?	7M

(OR)

8.	(a).	Explain the closed loop control system using a block diagram.	7M
	(b).	Explain PD and PID control.	7M

UNIT-V

9.	(a).	Describe basic elements of microprocessor based control system.	7M
	(b).	Lists out differences between microprocessor and microcontroller.	7M

(OR)

10.	(a).	Define PLC. Sketch and explain the basic functions of PLC.	7M
	(b).	What is an industrial robot? With the help of a block diagram describe different components of a robotic system.	7M

[B17 ME 4103]

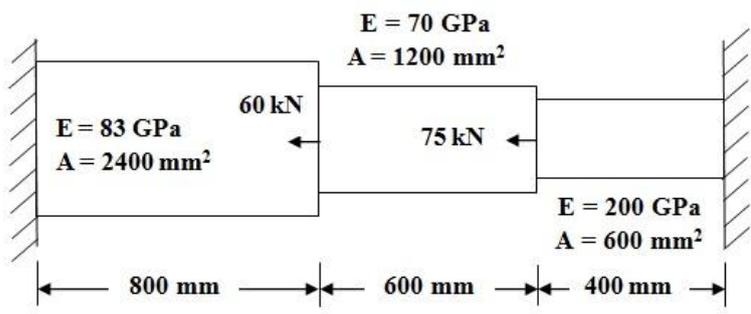
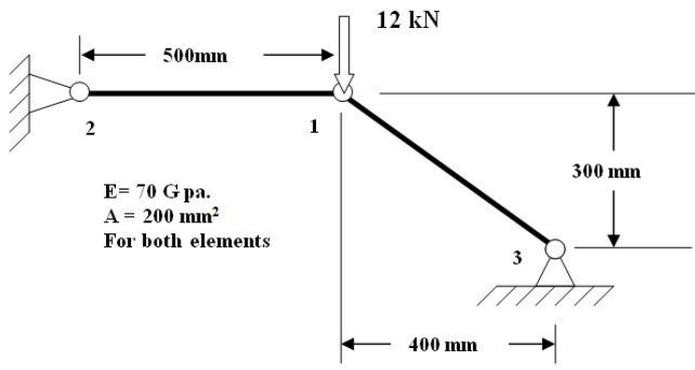
[B17 ME 4104]
IV B. Tech I Semester (R 17) Regular Examinations
FINITE ELEMENT ANALYSIS (Elective-I)
DEPARTMENT OF MECHANICAL ENGINEERING
MODEL QUESTION PAPER

TIME: 3Hrs.

Max. Marks:70

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

All questions carry equal marks.

UNIT-I			
1.	(a).	Derive the stress and strain relations for a 3D system.	8M
	(b).	List the applications of Finite Element Analysis	6M
(OR)			
2.	(a).	Discuss in detail about the general procedure of FEM formulation with an example.	8M
	(b).	Discuss in detail about plane stress and plane strain conditions.	6M
UNIT-II			
3.	Consider the bar as shown in Fig. 1 is subjected to a temperature difference of 60 ⁰ C. Determine the nodal displacements and stresses induced in the elements. Take the coefficient of thermal expansions as 18.9 × 10 ⁻⁶ / ⁰ C (for E=83GPa element), 18.9 × 10 ⁻⁶ / ⁰ C (for E=70GPa element) and 11.7 × 10 ⁻⁶ / ⁰ C (for E=200GPa element) respectively.		14M
			
Fig. 1			
(OR)			
4.	Derive the elemental stiffness matrix for one dimensional quadratic bar element.		14M
UNIT-III			
5.	For the two-bar truss shown in Fig. 2, determine the displacements of node 1 and the stress in element 1-3.		14M
			
Fig. 2			
(OR)			
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 × 10 ⁵ N/mm ² and I = 2500 cm ⁴ .		14M

UNIT-IV

- 7.** 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. **14M**

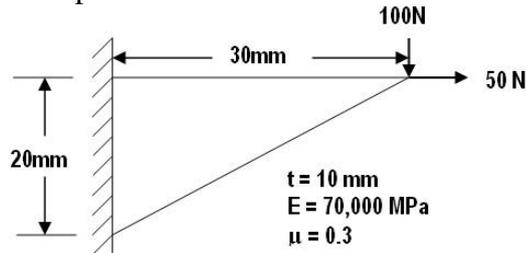


Fig. 3

(OR)

- 8. a)** Derive the shape functions for the following higher order elements (i) Nine Nodded Quadrilateral Element (ii) Eight Nodded Quadrilateral Element (iii) Six Nodded Triangular Element **8M**

- 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. **6M**

UNIT-V

- 9.** Derive the elemental stiffness matrix for 3noded triangular axi symmetric element. **14M**

(OR)

- 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). **14M**

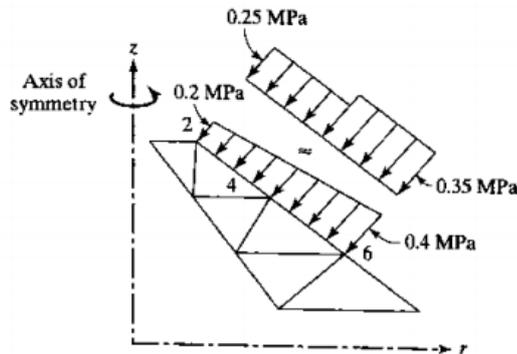


Fig. 4

[B17 ME 4105]
IV B. Tech I Semester (R 17) Regular Examinations
AUTOMATION IN MANUFACTURING (Elective-I)
DEPARTMENT OF MECHANICAL ENGINEERING
MODEL QUESTION PAPER

TIME: 3Hrs.

Max. Marks:70

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

All questions carry equal marks.

UNIT-I			
1.	(a).	Explain levels of an automation	7M
	(b).	Explain automation in production systems	7M
(OR)			
2.	(a).	Differentiate programmable and flexible automation.	7M
	(b).	What strategies are framed for automation?	7M
UNIT-II			
3.	(a).	Explain automated storage/retrieval systems	7M
	(b).	Explain about bar code technology	7M
(OR)			
4.	(a).	What are the types of AS/RS systems? Explain any two of them.	7M
	(b).	What are the design aspects considered in an AS/RS system?	7M
UNIT-III			
5.	(a).	Explain line balancing problem with an example	7M
	(b).	What are automation production lines	7M
(OR)			
6.	(a).	What are the three configurations of automated flow lines?	7M
	(b).	What is instantaneous control and memory control in control functions?	7M
UNIT-IV			
7.	(a).	Explain about production flow analysis	7M
	(b).	Explain about group technology	7M
(OR)			
8.	(a).	Explain how adaptive control is differentiated from conventional feedback control?	7M
	(b).	What are the situations where adaptive control can be beneficially applied?	7M
UNIT-V			
9.	(a).	Explain about CMM	7M
	(b).	Explain about inspection principles and its strategies	7M
(OR)			
10.	(a).	Describe with neat sketch, the working of machine vision.	7M
	(b).	Explain about non contact inspection methods	7M

[B17 ME 4105]

[B17 ME 4106]
IV B. Tech I Semester (R 17) Regular Examinations
QUALITY CONTROL AND ASSURANCE (Elective-I)
DEPARTMENT OF MECHANICAL
MODEL QUESTION PAPER

TIME: 3Hrs.

Max. Marks:70

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

All questions carry equal marks.

UNIT-I																																							
1.	(a).	What do you mean by quality of design, quality of conformance and quality of performance?	7M																																				
	(b).	What is Deming's philosophy? Explain.	7M																																				
(OR)																																							
2.	(a).	Explain Quality Cost and Statistical Quality Control?	7M																																				
	(b).	Explain warning limits with neat diagrams?	7M																																				
UNIT-II																																							
3.	(a).	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. Sample Five measurements per sample (x) <table style="margin-left: auto; margin-right: auto; border: none;"> <tr> <td></td> <td style="text-align: center;">1</td> <td style="text-align: center;">2</td> <td style="text-align: center;">3</td> <td style="text-align: center;">4</td> <td style="text-align: center;">5</td> </tr> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">10.5</td> <td style="text-align: center;">10.17</td> <td style="text-align: center;">10.16</td> <td style="text-align: center;">10.18</td> <td style="text-align: center;">10.16</td> </tr> <tr> <td style="text-align: center;">2</td> <td style="text-align: center;">10.17</td> <td style="text-align: center;">10.19</td> <td style="text-align: center;">10.14</td> <td style="text-align: center;">10.11</td> <td style="text-align: center;">10.17</td> </tr> <tr> <td style="text-align: center;">3</td> <td style="text-align: center;">10.16</td> <td style="text-align: center;">10.14</td> <td style="text-align: center;">10.15</td> <td style="text-align: center;">10.17</td> <td style="text-align: center;">10.15</td> </tr> <tr> <td style="text-align: center;">4</td> <td style="text-align: center;">10.19</td> <td style="text-align: center;">10.18</td> <td style="text-align: center;">10.17</td> <td style="text-align: center;">10.15</td> <td style="text-align: center;">10.16</td> </tr> <tr> <td style="text-align: center;">5</td> <td style="text-align: center;">10.14</td> <td style="text-align: center;">10.16</td> <td style="text-align: center;">10.15</td> <td style="text-align: center;">10.14</td> <td style="text-align: center;">10.17</td> </tr> </table> State whether the process is under control or not		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	14M
	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																																		
(OR)																																							
4.	(a).	An automobile part has to conform to the specification of 5.0 ± 0.15 , failing which it must be scrapped. The data gathered by the quality control department as follows : $n=5$; number of samples =20 , $\Sigma X=100.2, \Sigma \sigma =4.8$ set up the X and σ control charts . Assuming that the process is under control, what percentage of the total parts produced actually fell outside the specification limits?	14M																																				
UNIT-III																																							
5.	(a).	What are the objectives of p-chart? Outline the theory underlying control charts for fraction defective?	7M																																				
	(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. Ascertain whether the process is in a state of quality control	7M																																				
(OR)																																							

6.	(a).	number of non conformities on 22 sample (production days in July) of 50 enhanced graphic adapter cards each is given in table. Develop a C-chart. If any points are out of control, assume that assignable causes can be found and revise the control limits appropriately		14M		
		SAMPLE	NONCONFORMITES		SAMPLE	NONCONFORMITES
		1	12		12	28
		2	6		13	14
		3	14		14	15
		4	11		15	13
		5	16		16	2
		6	9		17	9
		7	11		18	10
		8	17		19	14
		9	8		20	11
		10	13		21	13
		11	21		22	16

UNIT-IV

7.	(a).	What is process capability? How do you determine process capability? Explain.	7M
	(b).	Explain smaller the better type and larger the better type?	7M

(OR)

8.	(a).	An assembly contains 3 parts joined lengthwise with the following lengths and 7M standard deviations:		14M
		Part no.	Average length (mm)	
		1	15.56	0.12
		2	9.65	0.014
		3	12.72	0.011

Find the standard deviation of the assembly. Assuming upper and lower specification limits at 4σ distance from the average. Compute the specification for the assembly. Compare the values with the specification limits obtained from simple addition of the maximum and minimum allowable values of the parts.

UNIT-V

9.	(a).	Explain double sampling plan with a neat schematic?	14M
		Draw on O.C curve for the double sampling plan $N=1000$, $n_1=50$, $C_1=1$, $n_2=25$, $C_2=2$	

(OR)

10.	(a).	Design a single sampling plan which meet the producer's risk is defined by $\alpha = 0.05$ 7M for AQL = 0.9 and the consumer's risk is defined by $\beta = 0.10$ for LTPD = 7.8.	14M
		(i) Keep the consumer's risk at 0.10 and producer's risk ≤ 0.05 but as near 0.05 as possible. (ii) Keep the producer's risk at 0.05 and consumer's risk as close 0.10 as possible.	

[B17 ME 4107]

IV B. Tech I Semester (R 17) Regular Examinations
PROJECT MANAGEMENT (Elective-II)
DEPARTMENT OF MECHANICAL ENGINEERING
MODEL QUESTION PAPER

TIME: 3Hrs.

Max. Marks:70

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

All questions carry equal marks.

UNIT-I																																																														
1.	(a).	State the characteristics of projects.	7M																																																											
	(b).	Elucidate different stages in project management.	7M																																																											
(OR)																																																														
2.	(a).	Define and state the objectives of project management.	7M																																																											
	(b).	Describe in detail the project life cycle.	7M																																																											
UNIT-II																																																														
3.	(a).	Describe the role of work break down structure in project planning and control.	7M																																																											
	(b).	<table border="1" style="width: 100%; border-collapse: collapse; margin-bottom: 10px;"> <thead> <tr> <th style="text-align: center;">S. No</th> <th style="text-align: center;">ACT</th> <th style="text-align: center;">DUR</th> <th style="text-align: center;">PREDECESSORS</th> </tr> </thead> <tbody> <tr><td style="text-align: center;">5</td><td style="text-align: center;">B</td><td style="text-align: center;">5</td><td></td></tr> <tr><td style="text-align: center;">10</td><td style="text-align: center;">M</td><td style="text-align: center;">4</td><td style="text-align: center;">B</td></tr> <tr><td style="text-align: center;">15</td><td style="text-align: center;">N</td><td style="text-align: center;">9</td><td style="text-align: center;">B</td></tr> <tr><td style="text-align: center;">20</td><td style="text-align: center;">Q</td><td style="text-align: center;">15</td><td style="text-align: center;">B</td></tr> <tr><td style="text-align: center;">25</td><td style="text-align: center;">A</td><td style="text-align: center;">1</td><td style="text-align: center;">M, N</td></tr> <tr><td style="text-align: center;">30</td><td style="text-align: center;">F</td><td style="text-align: center;">4</td><td style="text-align: center;">N, Q</td></tr> <tr><td style="text-align: center;">35</td><td style="text-align: center;">X</td><td style="text-align: center;">9</td><td style="text-align: center;">Q</td></tr> <tr><td style="text-align: center;">40</td><td style="text-align: center;">C</td><td style="text-align: center;">9</td><td style="text-align: center;">Q</td></tr> <tr><td style="text-align: center;">45</td><td style="text-align: center;">Y</td><td style="text-align: center;">9</td><td style="text-align: center;">A, F, X</td></tr> <tr><td style="text-align: center;">50</td><td style="text-align: center;">S</td><td style="text-align: center;">6</td><td style="text-align: center;">F</td></tr> <tr><td style="text-align: center;">55</td><td style="text-align: center;">J</td><td style="text-align: center;">5</td><td style="text-align: center;">X, F</td></tr> <tr><td style="text-align: center;">60</td><td style="text-align: center;">T</td><td style="text-align: center;">10</td><td style="text-align: center;">C</td></tr> <tr><td style="text-align: center;">65</td><td style="text-align: center;">V</td><td style="text-align: center;">5</td><td style="text-align: center;">Y, S</td></tr> <tr><td style="text-align: center;">70</td><td style="text-align: center;">U</td><td style="text-align: center;">10</td><td style="text-align: center;">V, T, J</td></tr> </tbody> </table> <p>For the above given data,</p> <ol style="list-style-type: none"> 1. Construct a precedence diagram. 2. On the diagram, compute the four scheduled dates (ESD, EFD, LSD, LFD) and the four floats (TF, FF, INTF and IDF) for each activity, and the lag for each link. 3. Identify the critical path. 	S. No	ACT	DUR	PREDECESSORS	5	B	5		10	M	4	B	15	N	9	B	20	Q	15	B	25	A	1	M, N	30	F	4	N, Q	35	X	9	Q	40	C	9	Q	45	Y	9	A, F, X	50	S	6	F	55	J	5	X, F	60	T	10	C	65	V	5	Y, S	70	U	10	V, T, J
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4.	(a).	Explain in detail the concepts: levelling of a time constrained project and resource constrained project.	7M																																																											
	(b).	Describe the process of estimating the costs in projects.	7M																																																											
UNIT-III																																																														
5.	(a).	Write a note on different sources of risks and risk identification techniques.	7M																																																											
	(b).	Explicate different risk analysis methods.	7M																																																											
(OR)																																																														
6.	(a).	With an example explain how to reduce the risks in project management.	7M																																																											

	(b).	Describe the process of risk response planning.	7M
UNIT-IV			
7.	(a).	Explain the scope of project control process.	7M
	(b).	Delineate different types of project evaluations.	7M
(OR)			
8.	(a).	Present a brief note on different types of meetings for the purpose of project communication	7M
	(b).	State the reasons for terminating the project.	7M
UNIT-V			
9.	(a).	State the role of project manager and his responsibilities.	7M
	(b).	Present a note on different types of authorities in project management.	7M
(OR)			
10.	(a).	Explain the process of team building approach.	7M
	(b).	Write about stress in projects and the way to manage it.	7M

[B17 ME 4107]

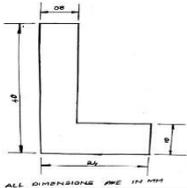
[B17 ME 4108]
IV B. Tech I Semester (R 17) Regular Examinations
TOOL DESIGN (Elective- II)
DEPARTMENT OF MECHANICAL ENGINEERING
MODEL QUESTION PAPER

TIME: 3Hrs.

Max. Marks:70

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

All questions carry equal marks.

UNIT-I			
1.	(a).	Describe with a neat sketch 3-2-1 principle of locating a rectangular work piece	7M
	(b).	With a neat sketch explain about mechanical actuation clamping devices.	7M
(OR)			
2.	(a).	What are the various location devices? Explain these with the aid of suitable sketches.	7M
	(b).	Explain the various types of clamping devices with neat sketch.	7M
UNIT-II			
3.	(a).	Draw a neat sketch of a milling fixture and explain by indicating its parts.	7M
	(b).	Explain in detail about Channel Jig.	7M
(OR)			
4.	(a).	Explain the principles of lathe and milling fixtures.	7M
	(b).	With a neat sketch explain Turn Over Jigs	7M
UNIT-III			
5.	(a).	Write short notes on strippers, pressure plates and pilots.	7M
	(b).	Determine centre of pressure of the following banked shape.	7M
			
(OR)			
6.	(a).	Write short notes about Spring back effect and Bend Allowance	7M
	(b).	What are the factors that effecting drawing Process	7M
UNIT-IV			
7.	(a).	With a neat sketch explain two plate mould.	7M
	(b).	Explain in detail about Blow moulding and calendaring	7M
(OR)			
8.	(a).	Explain the different types of Die casting Dies.	7M
	(b).	Explain Pressure Die casting process and the Technique of filling the Die Cavity	7M
UNIT-V			
9.	(a).	Determine the sizes of GO and NOGO gauges for checking the components with $50H_7/f_8$ i.e., $50_{-0.00}^{+0.025}/50_{-0.119}^{+0.08}$	8M
	(b).	Explain different tooling materials used and their composition.	6M
(OR)			
10.	(a).	Differentiate Work shop gauge and Inspection gauge.	7M
	(b).	Explain the taylor's principle of Gauge Design.	7M

[B17 ME 4108]

[B17 ME 4109]
IV B. Tech I Semester (R 17) Regular Examinations
REFRIGERATION AND AIR CONDITIONING (Elective-II)
DEPARTMENT OF MECHANICAL ENGINEERING
MODEL QUESTION PAPER

TIME: 3Hrs.

Max. Marks:70

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

All questions carry equal marks.

UNIT-I			
1.	(a).	Derive an equation of COP for Bell-Coleman Air-refrigerator show different processes on P-V and T-S Diagram	7M
	(b).	An aircraft moving with speed of 1000 km/hr uses simple gas refrigeration cycle for air conditioning. The ambient pressure and temperature are 0.35bar and -10 ⁰ C respectively. The pressure ratio of compressor is 4.5. The heat exchanger effectiveness is 0.95. The isentropic efficiencies of compressor and expander are 0.8 each. The cabin pressure and temperature are 1.06bar and 25 ⁰ C. Determine temperature and pressures at all points of the cycle. Also find the volume flow rate through compressor inlet and expander outlet for 100 TR. Take CP=1.005 kJ/kg-K; R=0.287 kJ/kg-K and CP/CV=1.4 for air.	7M
(OR)			
2.	(a).	Illustrate Boot strap Air craft – Refrigeration system with neat sketch.	7M
	(b).	A boot-strap cooling system of 10TR capacity is used in an airplane. The ambient air temperature and pressure are 20 ⁰ C and 0.85 bar respectively. The pressure of air increases from 0.85 bar to 1bar due to remaining action of air. The pressure of air discharged from the main compressor is 3bar. The discharged pressure of air from the auxiliary compressor is 4bar. The isentropic efficiency of each of the compressor is 80%, while that of turbine is 85%. 50% of the enthalpy of air discharged from the air compressor is removed in the first heat exchanger and 30% of the enthalpy of air discharged from the auxiliary compressor is removed in the second heat exchanger using rammed air. Assuming ramming action to be isentropic, the required cabin pressure of 0.9 bar and temperature of air leaving the cabin not more than 20 ⁰ C, find: 1. The power required to operate the system; 2. The COP of the system. Draw the schematic and temperature entropy diagram of the system. Take $\gamma = 1.4$ and $c_p = 1$ KJ/Kg K.	7M
UNIT-II			
3.	(a).	Explain the different method of improving the COP of simple compression refrigeration cycle.	7M
	(b).	A vapour compression refrigeration plant works between pressures limits of 5.3 bar and 2.1 bar. The vapour is super heated at the end of compression, its temperature being 37 ⁰ C. The vapour is super heated by 5 ⁰ C before entering the compressor. If the specific heat of super heated vapour is 0.63KJ Kg–K , find the COP of the plant.	7M
(OR)			
4.	(a).	How are refrigerants classified? Explain the properties of ammonia refrigerant.	7M
	(b).	A single compressor using R-12 as refrigerant has three evaporators of capacity 30TR, 20TR and 10TR. The temperature in the three evaporators is to be maintained at -10 ⁰ C, 5 ⁰ C and 10 ⁰ C respectively. The condenser pressure is 9bar. The liquid refrigerant leaving the condenser is sub-cooled to 30 ⁰ C. The vapour leaving the evaporators is dry and saturated. Assuming isentropic compression,	7M

		calculate i) the mass of refrigerant flowing through each evaporator; ii) the power required to drive the compressor; and iii) C.O.P. of the system.	
UNIT-III			
5.	(a).	Describe with a neat sketch about principles of operation of Electrolux refrigerator.	7M
	(b).	Derive the expression for COP of the Vapour absorption system.	7M
(OR)			
6.	(a).	Explain the working of steam jet refrigeration system with a neat sketch.	7M
	(b).	Explain the working principle of vortex tube with a neat sketch.	7M
UNIT-IV			
7.	(a).	Explain about the cooling and dehumidification process with a neat sketch.	7M
	(b).	Explain about the factors influencing the effective temperature of human comfort.	7M
(OR)			
8.	(a).	Estimate: 1.the temperature to which the air should be preheated. 2. the total heating required; 3. The humidifying efficiency of the air washer for the Air at 10 ⁰ C dry bulb temperature and 90% relative humidity is to be heated and humidified to 35 ⁰ C dry bulb temperature and 22.5 ⁰ C wet bulb temperature. The air is preheated sensibly before passing to the air washer in which water is recirculated. The relative humidity of the air coming out of the air washer is 90%. The air is again reheated sensibly to obtain the final desired condition.	7M
	(b).	When is dehumidification of air necessary and how it is achieved?	7M
UNIT-V			
9.	(a).	Explain about the summer and winter air conditioning with a neat sketch.	7M
	(b).	Explain the load concepts of (1) RSHF (2) GSHF	7M
(OR)			
10.	(a).	A room has a sensible heat gain of 24kw and a latent heat gain of 5.2kw and it has to be maintained at 26 ⁰ C DBT 50% RH.180 m ³ /min of air is delivered to the room. Determine the state of supply air	7M
	(b).	Classify Air conditioning loads and explain in detail.	7M

[B17ME4103]

[B17 ME 4201]
IV B. Tech II Semester (R 17) Regular Examinations
PRODUCTION PLANNING AND CONTROL
DEPARTMENT OF MECHANICAL ENGINEERING
MODEL QUESTION PAPER

TIME: 3Hrs.

Max. Marks:70

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

All questions carry equal marks.

UNIT-I																																															
1.	(a).	What are the functions of PPC? Explain			7M																																										
	(b).	What are different types of production? Give examples.			7M																																										
(OR)																																															
2.	(a).	Distinguish between production planning and production control and state their objectives.			7M																																										
	(b).	Discuss organization of Production planning and control department.			7M																																										
UNIT-II																																															
3.	(a).	What are the types of forecasting? Explain exponential smoothing method.			7M																																										
	(b).	Use exponential smoothing and the data in the table to determine the un computed monthly forecasts (The slots marked by x 's) of 2017.			7M																																										
		<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2" style="text-align: center;">Month</th> <th rowspan="2" style="text-align: center;">Actual monthly demand</th> <th colspan="3" style="text-align: center;">Monthly demand forecast using a smoothing factor of</th> </tr> <tr> <th style="text-align: center;">0.2</th> <th style="text-align: center;">0.5</th> <th style="text-align: center;">0.8</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">April</td> <td style="text-align: center;">120</td> <td style="text-align: center;">120</td> <td style="text-align: center;">120</td> <td style="text-align: center;">120</td> </tr> <tr> <td style="text-align: center;">May</td> <td style="text-align: center;">140</td> <td style="text-align: center;">X</td> <td style="text-align: center;">x</td> <td style="text-align: center;">X</td> </tr> <tr> <td style="text-align: center;">June</td> <td style="text-align: center;">160</td> <td style="text-align: center;">X</td> <td style="text-align: center;">x</td> <td style="text-align: center;">X</td> </tr> <tr> <td style="text-align: center;">July</td> <td style="text-align: center;">110</td> <td style="text-align: center;">X</td> <td style="text-align: center;">x</td> <td style="text-align: center;">X</td> </tr> <tr> <td style="text-align: center;">August</td> <td style="text-align: center;">120</td> <td style="text-align: center;">X</td> <td style="text-align: center;">x</td> <td style="text-align: center;">X</td> </tr> <tr> <td style="text-align: center;">September</td> <td style="text-align: center;">110</td> <td style="text-align: center;">X</td> <td style="text-align: center;">x</td> <td style="text-align: center;">X</td> </tr> <tr> <td style="text-align: center;">October</td> <td></td> <td style="text-align: center;">X</td> <td style="text-align: center;">x</td> <td style="text-align: center;">X</td> </tr> </tbody> </table>	Month	Actual monthly demand	Monthly demand forecast using a smoothing factor of			0.2	0.5	0.8	April	120	120	120	120	May	140	X	x	X	June	160	X	x	X	July	110	X	x	X	August	120	X	x	X	September	110	X	x	X	October		X	x	X		
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September	110	X	x	X																																											
October		X	x	X																																											
(OR)																																															
4.	(a).	Discuss the factors which affect the choice of forecasting method.			7M																																										
	(b).	Forecast the production for next two years when the production quantity for last ten years is as follows: 200, 225, 235, 240, 255, 260, 265, 275, 270, 271 Use the following methods and comment on results i) Moving average (3 years and 5 years) ii) Exponential smoothing for $\alpha=0.3$ and 0.7			7M																																										
UNIT-III																																															
5.	(a).	Explain the fixed order quantity system and periodic review system.			7M																																										
	(b).	A manufacturing company purchase 9000 parts of a machine for its annual requirements, ordering one month's usage at a time. Each part costs Rs. 20. The ordering cost per order is Rs.15 and the carrying charges are 15% of the average inventory per year. You have been assigned to suggest a more economical purchasing policy for the company. What advice would you offer and how much would it save the company per year?			7M																																										
(OR)																																															
6.	(a).	Explain in detail about MRP and MRP-II.			7M																																										
	(b).	Ten items kept in inventory by the school of management studies at central university are listed below. Perform ABC analysis on the items.			7M																																										

Item	Annual usage (units)	Value per unit (Rs.)
1	200	40.00
2	100	360.00
3	2,000	0.20
4	400	20.00
5	6,000	0.04
6	1,200	0.80
7	120	100.00
8	2,000	0.70
9	1,000	1.00
10	80	400.00

UNIT-IV																													
7.	(a).	What is aggregate planning? Write its functions, merits and demerits	7M																										
	(b).	Define routing and its significance. Explain about the important components of routing sheet?	7M																										
(OR)																													
8.	(a).	What are the factors affecting routing?	7M																										
	(b).	What are Gantt charts? Explain with an example.	7M																										
UNIT-V																													
9.	(a).	Explain in detail about line of balance technique of scheduling	7M																										
	(b).	A machine shop has 5 machines – A, B, C, D and E. Two jobs must be processed through each of these machines. The time (in hours) taken on each of the machines and the necessary sequence of jobs through the shop are given below. Use graphic method to obtain minimum elapsed time and the idle times on machines.	7M																										
<table border="1"> <tbody> <tr> <td rowspan="2">Job-1</td> <td>Sequence</td> <td>A</td> <td>B</td> <td>C</td> <td>D</td> <td>E</td> </tr> <tr> <td>Time</td> <td>2</td> <td>3</td> <td>4</td> <td>6</td> <td>2</td> </tr> <tr> <td rowspan="2">Job-2</td> <td>Sequence</td> <td>B</td> <td>C</td> <td>A</td> <td>D</td> <td>E</td> </tr> <tr> <td>Time</td> <td>4</td> <td>5</td> <td>3</td> <td>2</td> <td>6</td> </tr> </tbody> </table>				Job-1	Sequence	A	B	C	D	E	Time	2	3	4	6	2	Job-2	Sequence	B	C	A	D	E	Time	4	5	3	2	6
Job-1	Sequence	A	B		C	D	E																						
	Time	2	3	4	6	2																							
Job-2	Sequence	B	C	A	D	E																							
	Time	4	5	3	2	6																							
(OR)																													
10.	(a).	Explain the dispatching procedure.	7M																										
	(b).	What are the applications of computer in production planning and control ?	7M																										

[B17 ME 4201]

[B17 ME 4202]
IV B. Tech II Semester (R 17) Regular Examinations
POWER PLANT ENGINEERING (Elective-III)
DEPARTMENT OF MECHANICAL
MODEL QUESTION PAPER

TIME: 3Hrs.

Max. Marks:70

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

All questions carry equal marks.

UNIT-I			
1.	(a).	What are the basic resources in India for power generation? List out their capacities in different regions.	7M
	(b).	What are the basic coal ingredients? Explain their effects on furnace design.	7M
(OR)			
2.	(a).	Why the draught is required in the steam power plants? Explain the different methods to achieve the required draught.	7M
	(b).	Explain the principle of operation of electro static precipitator (ESP) along with the suitable diagram.	7M
UNIT-II			
3.	(a).	Why supercharging is necessary in diesel plant? What are the methods used for supercharging the diesel engine?	7M
	(b).	Discuss the essential components of the diesel power plant with neat layout.	7M
(OR)			
4.	(a).	What do you understand by a closed cycle gas turbine plant? List out its advantages over open cycle plant.	7M
	(b).	Compare the merits and demerits of open and closed cycle gas turbine power plant.	7M
UNIT-III			
5.	(a).	What are the factors to be considered in selecting site for hydro electric power plant?	7M
	(b).	What is hydrograph? Explain its importance in the design of storage type hydro electric power plant.	7M
(OR)			
6.	(a).	What are typical ponds and storage units suitable for installation of hydroelectric power plants? Explain them	7M
	(b).	What is the importance of spill ways in hydro electric power projects? Explain their practical applications.	7M
UNIT-IV			
7.	(a).	Explain the construction and working of nuclear power plant with a layout.	7M
	(b).	Describe the principle of operation of sodium Graphite reactor used for the nuclear power generation and explain the corresponding chemical reactions	7M
(OR)			
8.	(a).	What are different types of moderators used in the nuclear power plants? Explain the significance of moderators in the plants.	7M
	(b).	What do you understand by the gas cooled nuclear reactor and discuss the principle along with a neat sketch.	7M
UNIT-V			
9.	(a).	Explain any two methods of pollution in power plants.	7M
	(b).	Explain briefly about connecting Load, demand, peak load, demand factor, load factor.	7M

		(OR)	
10.	(a).	What are the pollution standards to be maintained in India? Explain.	7M
	(b).	What are different pollutants evolved from the thermal and nuclear power plants? Explain the methods to control them.	7M

[B17 ME 4202]

[B17 ME 4203]
IV B. Tech II Semester (R 17) Regular Examinations
AUTOMOBILE ENGINEERING & HYBRID VEHICLES (Elective-III)
DEPARTMENT OF MECHANICAL
MODEL QUESTION PAPER

TIME: 3Hrs.

Max. Marks:70

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

All questions carry equal marks.

UNIT-I			
1.	a).	Explain briefly the constructional features of the various parts of a car body	7M
	b).	Sketch an automobile Layout and Explain?	7M
OR			
2.	a).	What are the components of an automobile? Explain some of them?	7M
	b).	Briefly explain electronic ignition system?	7M
UNIT-II			
3.	a).	How clutches are classified? Explain the construction and operation of single plate clutch.	7M
	b).	Explain the working principle of a sliding mesh gear box with neat sketch.	7M
OR			
4.	a).	Explain Automatic Gear box?	7M
	b).	Differentiate between CVT and Epicyclical gear box?	7M
UNIT-III			
5.	a).	Explain the working of shock absorber with a neat sketch.	7M
	b).	What is meant by Wheel alignment? Write short notes on Caster and Camber?	7M
OR			
6.	a).	With the help of a neat sketch, explain the construction and operation of a power steering .	7M
	b).	Differentiate between Tube and Tubeless tyres?	7M
UNIT-IV			
7.	a).	Explain the working of hydraulic brake system with neat diagram	7M
	b).	What is meant by brake bleeding? Explain it	7M
OR			
8.	a).	Explain EGR system with neat diagram.	7M
	b).	Discuss about Antilock Braking system?	7M
UNIT-V			
9.	a).	Explain about hybrid vehicle drive train structure.	7M
	b).	What are the advantages and disadvantages of hybrid vehicles when compared with normal vehicles?	7M
OR			
10.	a).	Explain about periodic maintenance?	7M
	b).	Write short notes on preventive maintenance?	7M

[B17 ME 4203]

[B17 ME 4204]
IV B. Tech II Semester (R 17) Regular Examinations
ADDITIVE MANUFACTURING (Elective-III)
DEPARTMENT OF MECHANICAL ENGINEERING
MODEL QUESTION PAPER

TIME: 3Hrs.

Max. Marks:70

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

All questions carry equal marks.

UNIT-I			
1.	(a).	Describe the various stages in the development of rapid prototyping systems with highlighting the advantages and limitations	7M
	(b).	Explain rapid prototyping process chain.	7M
(OR)			
2.	(a).	Write the few applications of stereo lithography system?	7M
	(b).	Differentiate between core STL file and fine STL file.	7M
UNIT-II			
3.	(a).	List out the applications, advantages and disadvantages of laminated object manufacturing (LOM)?	7M
	(b).	Explain the path generation in fusion decomposition modeling (FDM)	7M
(OR)			
4.	(a).	Describe the working principle of three dimensional printing along with its advantages	7M
	(b).	In detail explain about process details and machine details of 3-D printing	7M
UNIT-III			
5.	(a).	Explain laser generation process with neat sketch & also its applications?	7M
	(b).	Describe the working principle with benefits and limitations of Electron beam melting	7M
(OR)			
6.	(a).	List the materials available for power based RP system. What are their respective applications.	7M
	(b).	Describe the working of selective laser melting.	7M
UNIT-IV			
7.	(a).	Describe various Rapid Prototyping Data Formats? Explain about the significance of STL format?	7M
	(b).	Describe the importance of magics, mimics, solid view, view expert operations in rapid prototyping software	7M
(OR)			
8.	(a).	State the reasons for reverse engineering in industries.	7M
	(b).	With the aid of suitable example explain the steps involved in reverse engineering.	7M
UNIT-V			
9.	(a).	Explain how RPT can be used for the production of rapid tooling for aerospace and electronics industries	7M
	(b).	Explain the process of RTV epoxy tooling. Write advantages, disadvantages and applications of it	7M
(OR)			
10.	(a).	Classify direct rapid tooling method	7M
	(b).	Explain about ceramic tooling process.	7M

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