Code No: R20D1513

R20

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

M.Tech I Year II Semester Supplementary Examinations, April 2022

Mechatronics

(MD)

Roll No										

Time: 3 hours **Max. Marks: 70**

Note: This question paper Consists of 5 Sections. Answer **FIVE** Questions, Choosing ONE Question from each SECTION and each Question carries 14 marks.

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SECTION-I

1	Explain the mechatronics design process?	**[14M]**
	OR	
2	Explain with neat sketches of input and output of transducers? And state the difference between the transducer and sensor?	**[14M]**

SECTION-II

3	What is power Amplifier and state and explain the three types of power amplifiers?	**[14M]**
	OR	
4	State the various parts used in semiconductor devices and explain its significance in solid state electronics?	**[14M]**

SECTION-III

5	State the types of process control valves and explain with neat sketches?	**[14M]**
	OR	
6	Explain with neat sketches of working of electro-hydraulic actuator?	**[14M]**

SECTION-IV

7	Explain the structure of microprocessor with block diagram explain how they are used in mobile systems?	**[14M]**
	OR	
8	State the differences between the microprocessor and microcontroller? State the types of microprocessors and micro-controllers?	**[14M]**

SECTION-V

9	What is the use of data acquisition system? Explain the Analog and digital data acquisition systems?	**[14M]**
	OR	
10	Explain analog to digital and digital to analog conversion systems with diagrams?	**[14M]**

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Code No: R20D1509

R20

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOL

(Autonomous Institution – UGC, Govt. of India)

M.Tech I Year II Semester Supplementary Examinations, April 2022

Advanced Mechanics of Machinery

(MD)

Roll No										

Time: 3 hours **Max. Marks: 70**

Note: This question paper Consists of 5 Sections. Answer **FIVE** Questions, Choosing ONE Question from each SECTION and each Question carries 14 marks.

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SECTION-I

1 Explain the analytical and graphical procedure to evaluate the diameter of the inflection circle under the following cases.

(a) When one pair of conjugate point and the corresponding ray angle given. **[7M]**

(b) When two pairs of conjugate points on different rays are given. **[7M]**

OR

2 Discuss Hartmann's construction with an example. **[14M]**

SECTION-II

3 a) State and prove Carter-hall circle theorem. **[7M]**

b) State and derive Hall equation. **[7M]**

OR

4 Give the expression for the radius of curvature of the fixed polode. Explain the terms involved in the equation. Deduce the Hall's equation form this equation. **[14M]**

SECTION-III

5 a) What is the Roto center triangle? What are the properties of the Roto center triangle? **[7M]**

b) Explain the construction of the Burmester's curve with a suitable example. **[7M]**

OR

6 a) With a neat sketch, explain graphical synthesis of 4-bar mechanism $A_0\ A_1\ B_1\ B_0$, which guides body AB through three prescribed positions A_1B_1, A_2B_2 and A_3B_3. **[7M]**

b) Explain how Burmester's curve will be constructed for a four-bar mechanism. **[7M]**

SECTION-IV

7 Synthesize a function generator to solve the equation $y = x^{0.6}$, in the interval $1 \leq x \leq 3$, with the range is divided into six intervals. Use Overlay method. **[14M]**

OR

8 Discuss the path generation by Roberts's theorem with a suitable example. **[14M]**

SECTION-V

9 Design and draw a four bar link mechanism to coordinate3 positions of input and output links as follows: **[14M]**

i. $\theta_1=0°$ $\theta_2=30°$ $\theta_3=60°$

ii. $\Phi_1=20°$ $\Phi_2=45°$ $\Phi_3=85°$

Take d= 1, Use Freudenstien' s equation.

OR

10 Design a four bar mechanism for the following prescribed instantaneous values of angular velocity and acceleration of the three moving links. **[14M]**

Driving link : $\omega_1 = 6$rad/s & $\alpha_1 = 0$ rad/s^2
Coupling Rod : $\omega_2 = 1$ rad/s & $\alpha_2 = 8$ rad/s^2
Driven link : $\omega_2 = 4$ rad/s & $\alpha_3 = 4$ rad/s^2

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Code No: R20D1514

R20

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

M.Tech I Year II Semester Supplementary Examinations, April 2022

Computer Integrated Manufacturing

(MD)

Roll No										

Time: 3 hours **Max. Marks: 70**

Note: This question paper Consists of 5 Sections. Answer **FIVE** Questions, Choosing ONE Question from each SECTION and each Question carries 14 marks.

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SECTION-I

1 State the stages of product life cycle and explain? **[14M]**

OR

2 Define group technology? Explain how is group technology used in cellular manufacturing? **[14M]**

SECTION-II

3 Define process planning? Explain the important steps in process planning? **[14M]**

OR

4 Explain the role of artificial intelligence in process planning? **[14M]**

SECTION-III

5 What is master production schedule (MPS) ? State the benefits and functions of MPS? **[14M]**

OR

6 What is quality control? State the differences between quality control and quality assurance? **[14M]**

SECTION-IV

7 Explain briefly terms used in quality control? **[14M]**

OR

8 What is computer aided testing? What are the types of it and explain them? **[14M]**

SECTION-V

9 State what are the types of manufacturing systems? And explain them? **[14M]**

OR

10 State the various machine tools used in CIM? And explain them briefly? **[14M]**

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Code No: R20D1510

R20

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOL(

(Autonomous Institution – UGC, Govt. of India)

M.Tech I Year II Semester Supplementary Examinations, April 2022

Experimental Stress Analysis

(MD)

Roll No										

Time: 3 hours **Max. Marks: 70**

Note: This question paper Consists of 5 Sections. Answer **FIVE** Questions, Choosing ONE Question from each SECTION and each Question carries 14 marks.

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SECTION-I

1 a) Discuss plane stress and Plane strain conditions with examples. **[7M]**

b) Discuss the Importance of compatibility conditions, also write their mathematical relations. **[7M]**

OR

2 What are the different types of resistance strain gauges? What are their advantages over other types of gauges? **[14M]**

SECTION-II

3 Explain the static recording and data logging system also write their any two practical applications. **[14M]**

OR

4 a) What are the recording instruments for strain gauges? **[4M]**

b) Discuss about telemetry system. **[10M]**

SECTION-III

5 Explain the brittle coating method in brief. What are the advantages and limitations of this method? **[14M]**

OR

6 What are the two techniques used for Moire's fringe analysis? Discuss the displacement approach in detail. **[14M]**

SECTION-IV

7 With the help of neat sketch explain the function of each component of a Circular Polariscope with both dark and light field arrangements. **[14M]**

OR

8 a) Explain with a neat sketch the principle of operation of a plane polariscope. **[7M]**

b) Briefly discuss various photoeleactic materials and their properties **[7M]**

SECTION-V

9 a) Explain briefly about 3-Diemsntional photo elastic materials. **[4M]**

b) Briefly explain about the machining of 3-Dimentional model. **[10M]**

OR

10 a) What is Birefringent coating? What are their uses and limitations? **[4M]**

b) Explain how stresses and strains can be determined by Birefringent coating. List out various assumptions made. **[10M]**

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