Code No: **R22D1510**

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
M.Tech I Year II Semester Regular/Supplementary Examinations, August 2024
Experimental Stress Analysis
(MD)

Roll No										

Time: 3 hours   **Max. Marks: 60**

Note: This question paper contains two parts A and B
Part A is compulsory which carries 10 marks and Answer all questions.
Part B Consists of 5 SECTIONS (One SECTION for each UNIT). Answer **FIVE** Questions,
Choosing ONE Question from each SECTION and each Question carries 10 marks.

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		PART-A (10 Marks) (Write all answers of this part at one place)	BCLL	CO(s)	Marks
1	A	How many independent stress components are there at a point in a body subjected to generalized state of stress?	L2	CO-I	[1M]
	B	Define strain gauge.	L1	CO-I	[1M]
	C	Define static recording.	L1	CO-II	[1M]
	D	What is data logging?	L2	CO-II	[1M]
	E	List different types of Brittle Coatings.	L1	CO-III	[1M]
	F	What are the applications of Moire's method?	L2	CO-III	[1M]
	G	What is photo elastic effect?	L2	CO-IV	[1M]
	H	What is isochromatic?	L2	CO-IV	[1M]
	I	What are the methods may be used for locking in stresses in three dimensional models?	L2	CO-V	[1M]
	J	What is the use of birefringent coatings?	L2	CO-V	[1M]

PART-B (50 Marks)
SECTION-I

			BCLL	CO(s)	Marks
2	A	What do you understand by plane stress and plane strain? Give examples.	L2	CO-I	[5M]
	B	Derive stress-strain relation for a three-dimensional body.	L3	CO-I	[5M]

OR

3	A	Explain the method of strain measurement using electrical resistance strain gauge.	L2	CO-I	[5M]
	B	What are the performance characteristics of wire and foil strain gauges that influence environmental factors?	L2	CO-I	[5M]

SECTION-II

4	A	Discuss the associated instrumentation for measuring (i) static strains (ii) dynamic strains	L3	CO-II	[5M]
	B	Explain how dynamic recording of intermediate frequencies are made.	L2	CO-II	[5M]

OR

| 5 | A | Discuss about telemetry system? | L2 | CO-II | [5M] |
| | B | Discuss how dynamic recording of very low frequencies are made | L2 | CO-II | [5M] |

SECTION-III

| 6 | A | What are the various crack detection methods? | L2 | CO-III | [3M] |
| | B | What are the various types of brittle coatings available? Discuss their important features. | L2 | CO-III | [7M] |

OR

| 7 | A | Discuss fundamental properties of the Moire's Fringes. | L2 | CO-III | [5M] |
| | B | Discuss Geometrical approach to Moire's Fringe analysis. | L2 | CO-III | [5M] |

SECTION-IV

| 8 | A | Discuss the important properties of isoclinics. How isoclinics of various Parameters can be obtained? | L2 | CO-IV | [8M] |
| | B | List various types of photoelastic materials. | L1 | CO-IV | [2M] |

OR

| 9 | A | Explain with a neat sketch the principle of operation of a plane polariscope. | L2 | CO-IV | [8M] |
| | B | What is the photoelastic effect? | L2 | CO-IV | [2M] |

SECTION-V

| 10 | A | Explain the various methods of locking-in stresses in brief. | L2 | CO-V | [5M] |
| | B | Discuss about 3-dimensional photo elastic materials. | L2 | CO-V | [5M] |

OR

| 11 | A | Briefly explain the use of Birefringence coating for stress analysis. | L2 | CO-V | [3M] |
| | B | What are the various methods used for stress separation? Explain the oblique incidence method in detail. | L2 | CO-V | [7M] |

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Code No: **R22D1513**
MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
M.Tech I Year II Semester Regular/Supplementary Examinations, August 2024
Mechatronics
(MD)

Roll No										

Time: 3 hours   **Max. Marks: 60**

Note: This question paper contains two parts A and B
Part A is compulsory which carries 10 marks and Answer all questions.
Part B Consists of 5 SECTIONS (One SECTION for each UNIT). Answer **FIVE** Questions,
Choosing ONE Question from each SECTION and each Question carries 10 marks.
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		PART-A (10 Marks) **(Write all answers of this part at one place)**	**BCLL**	**CO(s)**	**Marks**
1	A	What are the key elements of a mechatronics system?	L1	CO-I	[1M]
	B	Point out the types of sensors.	L4	CO-I	[1M]
	C	Define analog signals	L2	CO-II	[1M]
	D	What is the purpose of filters in mechatronic systems?	L1	CO-II	[1M]
	E	List the advantages and disadvantages of a hydraulic system.	L2	CO-III	[1M]
	F	What are the uses of electro mechanical system?	L1	CO-III	[1M]
	G	Compare microprocessor and micro controllers	L3	CO-IV	[1M]
	H	List the application of PLCs in computers.	L2	CO-IV	[1M]
	I	What are the micro controllers?	L5	CO-V	[1M]
	J	Name some future mechatronics system	L2	CO-V	[1M]

		PART-B (50 Marks)			
		SECTION-I			
2	A	Explain the terms mechatronics with suitable examples.	L2	CO-I	[5M]
	B	Illustrate about static characteristics of sensors briefly.	L4	CO-I	[5M]
		OR			
3	A	Identify the emerging areas of Mechatronics.	L1	CO-I	[5M]
	B	Explain the principle of any three sensors used for measuring displacement.	L4	CO-I	[5M]
		SECTION-II			
4	A	Describe the dry etching process in MEMS micromachining	L3	CO-II	[5M]
	B	Draw and explain the differential amplifier with a thermocouple.	L2	CO-II	[5M]
		OR			
5	A	Discuss the various passive components used in filtering noise signals.	L1	CO-II	[5M]
	B	Distinguish the DIAC and TRIAC.	L2	CO-II	[5M]
		SECTION-III			
6	A	What is actuators? List out different types of actuators	L42	CO-III	[5M]
	B	Analyse about Automatic car park barrier system based on	L4	CO-III	[5M]

Mechatronics approach.

<div align="center">OR</div>

| 7 | A | What are the difference between stepper motor and servo motor? | **L1** | **CO-III** | **[5M]** |
| | B | Discover the construction and working principle DC Servomotor with neat diagram. | **L3** | **CO-III** | **[5M]** |

<div align="center">

SECTION-IV
</div>

| 8 | A | What are the Programmable logic control advantages and disadvantages? | **L2** | **CO-IV** | **[5M]** |
| | B | Classify the different types of Process Controllers? Distinguish them in detail. | **L43** | **CO-IV** | **[5M]** |

<div align="center">OR</div>

| 9 | A | Point out the factors to be considered for selecting a PLC with one example. | **L4** | **CO-IV** | **[5M]** |
| | B | Derive a system using, using a PLC that could be used with a conveyor belt which is used to move an item to work station. The presence of item, at the work station 9IS DETECTED BY means of breaking a contact activated by a beam of light type a photo sensor there it stops for 100 sec. | **L5** | **CO-IV** | **[5M]** |

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SECTION-V
</div>

| 10 | A | Distinguish the features of analog and digital Data Acquisition Systems. | **L2** | **CO-V** | **[5M]** |
| | B | Explain the signal sampling, Time and space domain and Frequency domain in DSP. | **L2** | **CO-V** | **[5M]** |

<div align="center">OR</div>

| 11 | A | Design a mechatronics system for an automatic washing machine? | **L1** | **CO-V** | **[5M]** |
| | B | Compare traditional and mechatronics designs. | **L2** | **CO-V** | **[5M]** |

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MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
M.Tech I Year II Semester Regular/Supplementary Examinations, August 2024
Advanced Mechanics of Machinery
(MD)

Roll No										

Time: 3 hours   **Max. Marks: 60**

Note: This question paper contains two parts A and B

Part A is compulsory which carries 10 marks and Answer all questions.

Part B Consists of 5 SECTIONS (One SECTION for each UNIT). Answer **FIVE** Questions, Choosing ONE Question from each SECTION and each Question carries 10 marks.

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		PART-A (10 Marks)	**BCLL**	**CO(s)**	**Marks**
		(Write all answers of this part at one place)			
1	A	What is Inflection circle	L2	CO-I	[1M]
	B	Give the importance of Collineation axis Hartmann's Construction	L2	CO-I	[1M]
	C	Importance of Polode curvature	L3	CO-II	[1M]
	D	Give applications to Hall effect	L3	CO-II	[1M]
	E	Importance of Burmester's curve	L3	CO-III	[1M]
	F	What is Roto center triangle	L2	CO-III	[1M]
	G	Applications of Roto center method	L4	CO-IV	[1M]
	H	Importance of Overlay's method in function generation	L3	CO-IV	[1M]
	I	Importance of Precision point approximation	L3	CO-V	[1M]
	J	Give two applications to Method of components	L4	CO-V	[1M]

PART-B (50 Marks)

SECTION-I

			BCLL	CO(s)	Marks
2	A	Explain Bobillier construction	L3	CO-I	[5M]
	B	Explain Method of Normal Accelerations	L3	CO-I	[5M]
		OR			
3		Explain the role of inflection circle in kinematic analysis? Give examples	L3	CO-I	[10M]

SECTION-II

4	A	State and explain Freudenstein's Collineation axis theorem.	L4	CO-II	[5M]
	B	Explain briefly the Hall's method for the analysis of mechanisms	L4	CO-II	[5M]
		OR			
5		What is the significance of polode and polode curvature in four bar mechanism	L3	CO-II	[10M]

SECTION-III

6		Determine the position of the relative- roto centre in a four bar mechanism?	L2	CO-III	[10M]
		OR			
7		Explain Guiding a body though three distinct positions	L2	CO-III	[10M]

SECTION-IV

8	A	Explain Hrones's and Nelson's motion Atlas	L3	CO-IV	[5M]

B	Describe Roberts theorem	L3	CO-IV	[5M]

OR

9	Synthesize a function generator to solve the equation $y = x^{0.8}$, in the interval $1 \leq x \leq 3$, with the range is divided into six intervals. Use Overlay method.	L4	CO-IV	[10M]

SECTION-V

10	Explain the method of components in design of Four bar chain	L3	CO-V	[10M]

OR

11	Design and draw a four link mechanism to coordinate 3 positions of input and output links as follows:	L4	CO-V	[10M]

$\theta_1 = 0^0, \theta_2 = 30^0, \theta_3 = 60^0$ and $\phi_1 = 20^0, \phi_2 = 45^0, \phi_3 = 85^0$. Take d=1.

Use Freudenstein's equation.

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Code No: **R22D1514**

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
M.Tech I Year II Semester Regular/Supplementary Examinations, August 2024
Computer Integrated Manufacturing
(MD)

Roll No										

Time: 3 hours   Max. Marks: 60

Note: This question paper contains two parts A and B
Part A is compulsory which carries 10 marks and Answer all questions.
Part B Consists of 5 SECTIONS (One SECTION for each UNIT). Answer **FIVE** Questions,
Choosing ONE Question from each SECTION and each Question carries 10 marks.

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		PART-A (10 Marks)	**BCLL**	**CO(s)**	**Marks**
		(Write all answers of this part at one place)			
1	A	Define G.T.	L1	CO-I	[1M]
	B	What is meant by part families?	L1	CO-I	[1M]
	C	Name the two main components of generative type CAPP.	L1	CO-II	[1M]
	D	Which computer programming languages are suitable for CAPP?	L2	CO-II	[1M]
	E	Describe briefly about lead time in MRP?	L3	CO-III	[1M]
	F	Tell about independent demand?	L1	CO-III	[1M]
	G	Write about Machine Vision?	L1	CO-IV	[1M]
	H	What is meant by reliability of a product?	L1	CO-IV	[1M]
	I	Give the importance of material handling system in CIM.	L1	CO-V	[1M]
	J	Mention any principal data files in CIM.	L1	CO-V	[1M]

PART-B (50 Marks)
SECTION-I

			BCLL	**CO(s)**	**Marks**
2	A	Discuss the benefits of G.T.	L3	CO-I	[5M]
	B	What are the limitations of G.T.?	L1	CO-I	[5M]

OR

			BCLL	**CO(s)**	**Marks**
3		What factors must be considered in selecting a classification and coding system.	L1	CO-I	[10M]

SECTION-II

			BCLL	**CO(s)**	**Marks**
4		Explain the methodology to be followed for developing a generative type CAPP System.	L4	CO-II	[10M]

OR

			BCLL	**CO(s)**	**Marks**
5		Discuss in detail the principal of Variant process planning.	L3	CO-II	[10M]

SECTION-III

6		What are the basic functions of Master Production Schedule?	**L1**	**CO-III**	**[10M]**
		OR			
7	A	Define MRP-II. Why do you call it as close loop?	**L1**	**CO-III**	**[5M]**
	B	Explain about Forecasting in production control.	**L4**	**CO-III**	**[5M]**

SECTION-IV

8		What is the principle of scanning laser beam technique in CAQC? Explain with block diagram.	**L4**	**CO-IV**	**[10M]**
		OR			
9	A	Describe computer aided inspection and testing.	**L5**	**CO-IV**	**[5M]**
	B	Explain the terms (i) On line inspection (ii) Off line inspection.	**L4**	**CO-IV**	**[5M]**

SECTION-V

10	A	What are the different computer controls in CIM? Explain.	**L1**	**CO-V**	**[5M]**
	B	List the benefits of CIM.	**L1**	**CO-V**	**[5M]**
		OR			
11	A	Explain the principal components of FMS.	**L4**	**CO-V**	**[5M]**
	B	Discuss the various types of material handling systems.	**L5**	**CO-V**	**[5M]**

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