Code No: **R164203B** **R16** **Set No. 1**

IV B.Tech II Semester Regular/Supplementary Examinations, June - 2022

NON - DESTRUCTIVE EVALUATION

(Mechanical Engineering)

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

Question paper consists of Part-A and Part-B
Answer ALL sub questions from Part-A
Answer any FOUR questions from Part-B

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PART–A *(14 Marks)*

1.	a)	List the applications of X and Gamma Rays and its limitations?	[3]
	b)	Define reflection and refraction?	[2]
	c)	Outline the basic concept of liquid penetrant test?	[3]
	d)	State the principle of magnetic particle test?	[2]
	e)	List the applications of thermal testing?	[2]
	f)	Outline the span of NDE activities in railways?	[2]

PART–B *(4x14 = 56 Marks)*

2.		How would you explain the safety measurement of Industrial Radiography?	[14]
3.	a)	Explain the principle of ultrasonic testing in detail.	[7]
	b)	Discuss the effectiveness and limitations of ultrasonic testing?	[7]
4.	a)	Write in your own words about effectiveness and limitations of Liquid Penetrant Testing.	[7]
	b)	Illustrate the principle of eddy current testing in detail?	[7]
5.		Discuss the effective applications and limitations of the magnetic particle test?	[14]
6.	a)	Explain active and passive techniques in detail.	[7]
	b)	Discuss thermo mechanical behavior of materials?	[7]
7.		What do you think of activities and applications in nuclear, Non-nuclear and chemical industries in NDE?	[14]

Code No: **R164203B** **R16** **Set No. 2**

IV B.Tech II Semester Regular/Supplementary Examinations, June – 2022

NON - DESTRUCTIVE EVALUATION

(Mechanical Engineering)

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

Question paper consists of Part-A and Part-B
Answer ALL sub questions from Part-A
Answer any FOUR questions from Part-B
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PART–A *(14 Marks)*

1.	a)	List the advantages of Non-destructive testing?	[2]
	b)	Outline diffraction, mode conversion and attenuation?	[3]
	c)	State the significance of liquid penetrant test?	[2]
	d)	Outline the demagnetization of materials?	[2]
	e)	List the applications of infrared testing?	[2]
	f)	Give the importance of NDE in Automotive Industries?	[3]

PART–B *(4x14 = 56 Marks)*

2.		Analyze radiographic techniques in detail?	[14]
3.	a)	Illustrate the interpretations and guidelines for acceptance of ultrasonic testing?	[7]
	b)	State and explain the variables affecting ultrasonic test?	[7]
4.	a)	Explain the steps involved in liquid penetrant test in detail.	[7]
	b)	Discuss the applications of Eddy Current Testing?	[7]
5.	a)	Explain about magnetic particle test equipment in detail?	[8]
	b)	Describe the merits and demerits of standardization and calibration.	[6]
6.	a)	Analyze the contact thermal inspection methods?	[7]
	b)	Explain the importance of heat sensitive paints and heat sensitive papers?	[7]
7.		Discuss the applications of NDE in Aircraft and Aerospace Industries?	[14]

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Code No: **R164203B** **R16** **Set No. 3**

IV B.Tech II Semester Regular/Supplementary Examinations, June - 2022

NON - DESTRUCTIVE EVALUATION

(Mechanical Engineering)

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

Question paper consists of Part-A and Part-B
Answer ALL sub questions from Part-A
Answer any FOUR questions from Part-B
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PART–A *(14 Marks)*

1.	a)	Outline the benefits of radiographic test?	[2]
	b)	State piezo-electric effect?	[3]
	c)	List the applications of eddy current test?	[2]
	d)	State the significance of magnetic materials?	[2]
	e)	List the limitations of thermal testing?	[2]
	f)	Outline the span of NDE activities in railways?	[3]

PART–B *(4x14 = 56 Marks)*

2.		Illustrate the steps involved in film processing of radiographic testing.	[14]
3.	a)	Illustrate ultrasonic equipment with neat diagram?	[7]
	b)	Discuss the applications of ultrasonic testing?	[7]
4.	a)	Explain the working of liquid penetrant system with neat diagram.	[7]
	b)	Analyze eddy current test system in detail?	[7]
5.		Can you write in your own words of standardization, calibration, interpretation and evaluation of magnetic particle test?	[14]
6.	a)	Explain the techniques for applying liquid crystals.	[7]
	b)	Discuss IR imaging in aerospace applications?	[7]
7.		Discuss the applications of NDE in Offshore Gas and Petroleum Projects.	[14]

Code No: **R164203B** **R16** **Set No. 4**

IV B.Tech II Semester Regular/Supplementary Examinations, June – 2022

NON - DESTRUCTIVE EVALUATION

(Mechanical Engineering)

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

Question paper consists of Part-A and Part-B
Answer ALL sub questions from Part-A
Answer any FOUR questions from Part-B

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PART–A *(14 Marks)*

1.	a)	Outline the significance of Non-destructive testing?	[2]
	b)	State the principle of wave propagation?	[2]
	c)	List the advantages of liquid penetrant test?	[2]
	d)	Explain magnetization of materials in brief?	[3]
	e)	Outline the significance of pulse thermography?	[3]
	f)	Give the importance of NDE in Coal Mining Industry?	[2]

PART–B *(4x14 = 56 Marks)*

2.		Discuss radiographic test and radiographic equipment?	[14]
3.	a)	Explain the guidelines for rejection and effectiveness of ultrasonic testing.	[7]
	b)	Analyze the characteristics of ultrasonic transducers?	[7]
4.	a)	Illustrate the principle of Liquid Penetrant Test with neat diagrams?	[7]
	b)	Evaluate the theoretical analysis of eddy-current circuit and effectiveness of eddy current testing?	[7]
5.		Discuss the procedure of magnetic particle test in detail?	[14]
6.	a)	Illustrate the non-contact thermal inspection methods?	[7]
	b)	Explain infrared radiation and infrared detectors.	[7]
7.		Discuss the applications of NDE in pressure vessels, castings and welded constructions?	[14]