

Code No:R164203B

**R16**

**Set No. 1**

IV B.Tech II Semester Regular Examinations, September - 2020

**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) Write about the applications of Radiographic test? [2]
- b) State piezo-electric effect? [2]
- c) Write the applications of liquid penetration test. [3]
- d) State the principle of magnetic particle test? [3]
- e) List the applications of infrared testing? [2]
- f) Write about the importance of NDE in Coal Mining Industry? [2]

**PART-B(4x14 = 56 Marks)**

2. What is Radiography? Explain the principle of working of radiographic test. [14]  
Illustrate about safety aspects of industrial radiography?
3. a) Explain about the guidelines for acceptance, rejection and effectiveness of ultrasonic testing? [9]
- b) Write about applications and limitations of ultrasonic testing? [5]
4. a) Explain about the procedure of liquid penetrant test? [7]
- b) Explain about principle of eddy current testing. [7]
5. Describe about magnetic particle test equipment in detail? [14]
6. a) Discuss about the non destructive testing adopted for Honey comb structures. [7]
- b) Write about importance of heat sensitive paints and heat sensitive papers? [7]
7. Explain about span of NDE activities in Nuclear, Non-nuclear and Chemical Industries? [14]



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Set No. 2

IV B.Tech II Semester Regular Examinations, September - 2020

**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) Define Non-destructive evaluation? [2]
- b) What is meant by refraction? [2]
- c) List the applications of eddy current test? [3]
- d) Write about Demagnetization of Materials? [3]
- e) State the applications of thermal testing? [2]
- f) Write about span of NDE activities in railways? [2]

**PART-B**(4x14 = 56 Marks)

2. Explain about Radiographic test and Radiographic equipment? [14]
3. a) Describe about ultrasonic test equipment with neat diagram? [7]
- b) State and explain the variables affecting ultrasonic test? [7]
4. a) Explain about effectiveness and limitations of Liquid Penetrant Testing? [7]
- b) Describe about eddy current test system in detail? [7]
5. Describe in detail magnetic particle test procedure? Write limitations of the test. [14]
6. a) Discuss about active and passive approaches of NDE using infrared thermography. [7]
- b) Explain about thermo mechanical behavior of materials. [7]
7. Explain about the applications of NDE in Aircraft and Aerospace Industries. [14]



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**R16**

**Set No. 3**

IV B.Tech II Semester Regular Examinations, September - 2020

**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) Write about the benefits of Radiographic test? [2]
- b) Define diffraction and reflection? [2]
- c) Write about advantages of liquid penetrant test? [3]
- d) Write about magnetization of materials? [3]
- e) State the limitations of infrared testing? [2]
- f) Write about the importance of NDE in Automotive Industries? [2]

**PART-B(4x14 = 56 Marks)**

2. Describe about sources of X and Gamma Rays and their interaction with matter in detail? [14]
3. a) Explain about ultrasonic transducers and their characteristics? [7]
- b) Write about effectiveness and limitations of ultrasonic testing? [7]
4. a) Describe about liquid penetrant system with neat diagram? [8]
- b) Explain in detail about the applications of Eddy Current Testing [6]
5. Explain about Standardization, Calibration, Interpretation and Evaluation of Magnetic Particle Test? [14]
6. a) Describe about non-contact thermal inspection methods? [7]
- b) Illustrate about infrared radiation and infrared detectors? [7]
7. Explain about the applications of NDE in Offshore Gas and Petroleum Projects. [14]



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**R16**

**Set No. 4**

**IV B.Tech II Semester Regular Examinations, September - 2020**

**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) Write about the applications of X and Gamma Rays and its limitations? [2]
- b) State the principle of wave propagation? [2]
- c) What is the importance of liquid penetrant test? [3]
- d) Write about magnetization and demagnetization? [3]
- e) State the limitations of thermal testing? [2]
- f) Write about the importance of NDE in Automotive industries [2]

**PART-B(4x14 = 56 Marks)**

2. Describe about Radiographic Techniques? [14]
3. a) Explain about ultrasonic testing in detail? [7]
- b) Illustrate the interpretations and guidelines for acceptance of ultrasonic testing? [7]
4. a) Describe about principle of Liquid Penetrant Test with neat diagrams? [7]
- b) Illustrate about theoretical analysis of eddy-current circuit and effectiveness of Eddy Current Testing? [7]
5. Explain about effective applications and limitations of the magnetic particle test. [8]  
Explain the principle of magnetic particle test with a neat sketch. [6]
6. a) Describe about contact thermal inspection methods? Write its advantages and limitations when compared with non-contact method. [7]
- b) Explain about IR imaging in aerospace applications. [7]
7. Explain about the applications of NDE in pressure vessels and welded constructions. [14]



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**R16**

**Set No. 1**

**IV B.Tech II Semester Regular/Supplementary Examinations, July - 2021**  
**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) Mention the importance of the radiographic test. [2]
- b) What are ultrasonic transducers? Mention their characteristics. [2]
- c) What is the principle of eddy current testing? [2]
- d) What is demagnetization of materials? [2]
- e) What is the significance of thermographic testing method? [3]
- f) List out the applications of NDE in petroleum projects. [3]

**PART-B (4x14 = 56 Marks)**

2. a) Differentiate between X-Ray and  $\gamma$ -Ray radiographic techniques. [7]
- b) Discuss the working principle of Xero-Radiography. [7]
3. a) Explain Ultrasonic testing for roughness of the surfaces. [5]
- b) Illustrate with neat sketch about the following [9]
  - i) A-Scan
  - ii) B-Scan
  - iii) C-Scan
4. a) Summarize and explain the types of developers used in Liquid Penetration Testing. [7]
- b) Write short notes about the standard depth of penetration in Eddy Current Testing. [7]
5. a) With the help of neat sketches explain about any four types of magnetization techniques used in magnetic particle inspection. [9]
- b) Differentiate between direct and indirect method of magnetization. Write the advantages and disadvantages of both methods. [5]
6. a) Give a short note on Color change thermography. [7]
- b) Discuss the thermo mechanical behavior of materials. [7]
7. a) Explain the span of NDE activities in railways. [7]
- b) Discuss the NDE techniques used in automotive industries. [7]

