Code No: **R164203B** **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 γ-Ray radiographic techniques. [7]
   b) Discuss the working principle of Xero-Radiograogy. [7]

3. a) Explain Ultrasonic testing for roughness of the surfaces. [5]
   b) Illustrate with neat sketch about the following
      i) A-Scan
      ii) B-Scan
      iii) C-Scan [9]

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]