

**B.Tech. VI Semester (Main/Back) Examination, May-June 2015**  
**Mechanical Engineering**  
**6ME6.1 A Non Destructive Evaluation and Testing**  
**(Common for ME,PI)**

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**Time : 3 Hours**

**Maximum Marks : 80**  
**Min. Passing Marks : 24**

**Instructions to Candidates:**

*Attempt any **five** questions, selecting **one** question from **each unit**. All questions carry **equal** marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.*

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**Unit - I**

1. a) Define Non-Destructive Testing(NDT) methods and explain its various objectives. List various NDT methods and briefly explain any two (8)
- b) Discuss various factors that influence the reliability of Non-Destructive Evaluation (8)

**OR**

1. Discuss various defects found in the materials. Also explain how each such defect can be evaluated by Non-Destructive Testing methods (16)

**Unit - II**

2. Explain the working principles of

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- i) X-ray radiography
- ii) Gamma ray radiography (16)

2. a) Define Radiographic Sensitivity(RS) and discuss the variables affecting RS? (8)  
b) Describe the film processing, interpretation and evaluation of test results in radiography testing method (8)

**Unit - III**

3. a) Explain the principle of Ultrasonic NDT and discuss various variables affecting the same (8)  
b) How elastic constant of a material can be determined using Ultrasonic NDT(8)

3. a) Sketch schematic diagram of Ultrasonic NDT equipment set-up. Also explain the basic test methods used and types of scanning used in Ultrasonic NDT(8)  
b) How Ultrasonic NDT can be used for the tube inspection (8)

**Unit - IV**

4. Explain Magnetic particle Inspection(MPI) technique with neat labelled diagram (16)

4. Write short note on (any two)
- i) Acoustic Emission testing
  - ii) Thermography
  - iii) Magnetization techniques used in MPI (16)

5. a) What do you mean by eddy current and discuss theory of eddy current NDT (8)
- b) Discuss the factors affecting eddy current NDT (8)

OR

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5. a) What are the important factors which an engineer should keep in mind before selecting NDT methods (8)
- b) Mention the advantages and disadvantages of standard specification and codes (8)
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