

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY GURAJADA VIZIANAGARAM**  
**IV B. Tech I Semester Advanced Supplementary Examinations March - 2025**

**NON DESTRUCTIVE EVALUATION**

(Mechanical Engineering)

Time: 3 hours

Max. Marks: 70

Answer any **FIVE** Questions. **ONE** Question from **Each unit**

All Questions Carry Equal Marks

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**UNIT-I**

1. a) Explain in detail about the factors influencing the selection of NDT methods. [7M]  
b) Explain the working of radiography testing method. What are the advantages of gamma Radiography compared to X-ray radiography? [7M]

(OR)

2. a) Classify the different types of destructive and non - destructive testing methods and applications of each technique? [7M]  
b) State the various classes of films and explain their characteristics. [7M]

**UNIT-II**

3. a) Explain various components involved in ultrasonic testing equipment with block diagram. [7M]  
b) Discuss the working principle of Piezo-Electric transducer with neat sketch. [7M]

(OR)

4. a) Discuss the principle of pulse echo method with neat sketch in ultrasonic testing method. [7M]  
b) Explain with neat sketch about the data presentation methods in Ultrasonic test of non-destructive testing. [7M]

**UNIT-III**

5. a) Describe the post-emulsifiable - lipophilic and solvent removable methods in liquid penetrant testing using process flow diagram? [7M]  
b) Explain the Eddy current principle of eddy current testing with neat sketch [7M]

(OR)

6. a) Explain about various types of developers and their characteristics used in the liquid penetrant tes. [7M]  
b) Summarize the parameters to be considered for selection of probes in eddy current testing? [7M]

**UNIT-IV**

7. a) Explain with suitable sketch about following (i) Magnetization of irregular parts. (ii) Demagnetization [7M]  
b) Explain the following [7M]  
(i) Residual Magnetization. (ii) Properties of magnetic particle used in MPT.

(OR)

8. a) Discuss the interpretation and evaluation procedure involved in the magnetic particle testing [7M]  
b) With a neat sketch explain magnetic particle inspection method and its merits and demerits [7M]

**UNIT-V**

9. a) Explain the principle of thermography process and its advantages and disadvantages with neat sketch [7M]  
b) Discuss the working procedure involved in the Lock in thermography with neat sketch [7M]
- (OR)
10. a) Explain the instrumentation and various methods of thermography inspection [7M]  
b) Discuss how the liquid crystals are helpful in detecting the flaws in the components. [7M]

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