

# B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

## February / March 2023 Semester End Main Examinations

**Programme: B.E.**

**Branch: Mechanical Engineering**

**Course Code: 20ME7DENDT**

**Course: Non-Destructive Testing**

**Semester: VII**

**Duration: 3 hrs.**

**Max Marks: 100**

**Date: 24.02.2023**

**Instructions:** 1. Answer any FIVE full questions, choosing one full question from each unit.  
2. Missing data, if any, may suitably be assumed.

### UNIT - I

- 1 a) Define NDT; explain the benefits and limitations of NDT. **10**  
b) Define Visual inspection; explain briefly with a sketch of rigid boroscope in detail. **10**

### OR

- 2 a) Explain absolute and differential arrangement of coils used in eddy current inspection. **10**  
b) Explain the principle of eddy current inspection of bar with neat a sketch. **05**  
c) Explain i) magnetic permeability ii) lift off factor **05**

### UNIT - II

- 3 a) Explain the principle of liquid penetrant test with a neat sketch and types of penetrant methods. **10**  
b) What are penetrants? List any four principle requirements of a good penetrants. **10**

### UNIT - III

- 4 a) Define i) magnetic flux density ii) magnetizing force iii) reluctance iv) magnetic forces and v) magnetic field. **10**  
b) State the steps involved in magnetic particle testing and why illumination is essential in magnetic particle testing. **10**

### UNIT - IV

- 5 a) Explain with sketch the working principle of x-ray radiography and state its advantages, limitations and applications. **10**  
b) Classify x-ray films used in industrial radiography and brief about construction of film with simple line diagram. **05**  
c) Explain the types of radiation produced by radioactive decay (gamma ray) and their applications. **05**

**Important Note:** Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.

**UNIT - V**

- 6    a) Describe the basic principle of ultrasonic testing with a suitable block diagram. **10**
- b) How pulse echo method of ultra sonic inspection is carried out and also state the advantages, disadvantages of pulse echo method. **10**

**OR**

- 7    a) How ultrasonic testing procedure is formed in inspection of following areas i) inspection of casting ii) corrosion monitoring iii) weld inspection. **06**
- b) What are ultrasonic transducers? Explain piezo electric transducer. **04**
- c) Explain different types of ultrasonic transducers with construction and working details. **10**

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B.M.S.C.E. - ODD SEM 2022-23