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Question Paper Code : 30911

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2024.

Seventh/Eighth Semester

Mechanical Engineering

ME 8097 – NON DESTRUCTIVE TESTING AND EVALUATION

(Common to : Aeronautical Engineering/Manufacturing Engineering/Mechanical Engineering (Sandwich)/Production Engineering)

(Regulations 2017)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Define Non-Destructive Testing.
2. List the common NDT methods.
3. Define the term "Dwell time".
4. Magnetic particle inspection cannot be used to detect internal defects. Why?
5. Define thermography.
6. List the types of probe used in eddy current inspection.
7. Define transducer and list the types of ultrasonic transducer.
8. List the factors influencing acoustic waves propagation.
9. Define inverse square law in radiography.
10. Define Fluoroscopy.

PART B — (5 × 13 = 65 marks)

11. (a) Explain in detail the factors influencing the selection of NDT methods with suitable examples.

Or

- (b) Discuss in detail the different types of Borescopes used in visual inspection method with neat sketches.

12. (a) (i) Explain the various types of developers. (8)

- (ii) List out the various characteristics of developers. (5)

Or

- (b) Explain the various steps involved in Magnetic particle inspection process with suitable flow diagram.

13. (a) Explain the different types of Thermography testing and its applications.

Or

- (b) (i) Explain the principle of eddy current testing with neat sketch. (8)

- (ii) List the advantage and limitation of eddy current test. (5)

14. (a) Discuss the following Ultrasonic inspection technique with neat sketch.

- (i) Straight beam ultrasonic inspection method. (7)

- (ii) Angle beam ultrasonic inspection method. (6)

Or

- (b) Explain the principle of Acoustic emission test with neat sketch and its advantages, limitations and applications.

15. (a) (i) Describe the radiographic testing with suitable sketch. (7)

- (ii) Write short notes on radiographic film. (6)

Or

- (b) Explain about Computed Radiography with suitable sketch.

PART C — ($1 \times 15 = 15$ marks)

16. (a) With a suitable case study outline the steps for detecting crack in the materials by liquid penetrant testing.

Or

- (b) Explain the types of radiation produced by radioactive decay (gamma ray) and their application with neat sketch.
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