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Question Paper Code : 10913

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2025.

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. List any two manufacturing defects which can be detected by NDT.
2. Name at least two NDT techniques method that can be used to detect internal flaws.
3. Give the advantages and limitations of visible dye type of Liquid Penetrant Testing.
4. What are the effects of Magnetic particle size and shape on Magnetic Particle Inspection?
5. Define Thermography. List any two engineering applications.
6. How does the depth of penetration is affected by Probe frequency in Eddy current Testing.
7. Name the type of ultrasonic transducers used in ultrasonic inspection.
8. What is the source of acoustic emissions?
9. Differentiate between Film Radiography and Computed Radiography.
10. Mention the functions of filters and screens in X-ray film radiography.

PART B — (5 × 13 = 65 marks)

11. (a) Discuss the importance of aided visual inspection methods. List the advantages, limitations and applications of aided visual inspection method.

Or

- (b) (i) Discuss the defects in engineering components that can be detected by unaided visual inspection with relevant sketches. (8)
(ii) Differentiate between Non-Destructive Testing and Mechanical Testing. (5)

12. (a) Explain the operational sequence of Liquid Penetrant Testing (LPT). Also list the merits, limitations and applications of LPT.

Or

- (b) (i) With neat sketches, explain the working principle of Magnetic Particle Testing (MPT). (8)
(ii) List the Advantages, Disadvantages and Applications of Magnetic Particle Testing. (5)

13. (a) (i) List the different methods of Thermography. Explain any one method with a neat sketch. (8)
(ii) List out the advantages of Infrared Thermography. (5)

Or

- (b) Explain the various types of coils used for eddy current inspection and write about the Eddy current.

14. (a) Explain with a neat block diagram, the working principle of a pulse echo A-scan ultrasonic flaw detector to find discontinuities in a component.

Or

- (b) With a neat sketch, explain the working principle of Acoustic Emission Testing. Also list its advantages and disadvantages.

15. (a) (i) Write short notes on Computed Tomography. (5)
(ii) Discuss about the characteristics of films in film radiography. (8)

Or

- (b) With a neat sketch, explain the principle and procedure of film radiography. Also mention its merits and disadvantages.

PART C — (1 × 15 = 15 marks)

16. (a) Describe the principle and procedures for Phased array Ultrasonic Testing. Also discuss the importance of phased array UT in inspection of weldments.

Or

- (b) Describe the procedure to perform Computed Radiography inspections. Also give its applications, merits and limitations.
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