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Question Paper Code : 50867

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2023.

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. State the advantages of Non Destructive Evaluation.
2. List the any two equipments used for aided visual inspection.
3. Write any three properties required of a good Penetrant in LPT.
4. List the advantages and limitations of magnetic particle inspection.
5. Give the principle of infra red thermography.
6. List any two industrial applications for eddy current testing.
7. List the three types of ultrasonic waves used in the UT of components.
8. List the importance of probe frequency in UT.
9. What is principle of film radiography testing?
10. What is Penetrometer? Write any one type of penetrameters used for radiography testing.

PART B — (5 × 13 = 65 marks)

11. (a) Discuss the different types of Non Destructive testing used for engineering components. Also list the advantages and applications of NDT. (13)

Or

- (b) Explain the construction and working principle of various optical aids used in visual inspection. (13)

12. (a) (i) Explain the various stages of Liquid Penetrant Testing (LPT) to perform liquid penetrant testing for welded component. (8)
(ii) Discuss about the different types of penetrant used for Liquid Penetrant Testing. (5)

Or

- (b) (i) Discuss any two magnetization equipment used for Magnetic Particle Testing (MPT). (8)

- (ii) Explain the procedure for Demagnetization in MPT and list the importance of demagnetization. (5)

13. (a) (i) Explain the principle of thermography and list the advantages and imitations. (8)
(ii) Write short notes on infrared detector in thermography inspection. (5)

Or

- (b) (i) Explain the principle of Eddy Current (ET) testing and list the engineering applications. (5)

- (ii) Discuss about any two types of probes used for eddy current testing. (8)

14. (a) Explain the principle of acoustic emission testing. Also list its advantages, limitations and applications. (13)

Or

- (b) Explain the principle of Time Of Flight Diffraction (TOFD) and Phased array techniques of ultrasonic testing. (13)

15. (a) How computed radiography differs from conventional film radiography? Also briefly discuss about the principle of computed radiography. (13)

Or

- (b) Explain the types of radiation produced by radioactive decay (gamma ray) and their application. Also discuss about the important properties of gamma ray radiations. (13)

PART C — ($1 \times 15 = 15$ marks)

16. (a) Write short notes on the following :
- (i) Film density (3)
 - (ii) Properties of X rays and Gamma ray radiations (3)
 - (iii) Filters and screen (3)
 - (iv) Radiographic Contrast and Definition (3)
 - (v) Penetrameters. (3)

Or

- (b) Explain the different scan modes of ultrasonic testing. Discuss the use of UT to inspect porosity and cracks in materials. (15)
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