Reg. No. : | | | | | | | | | | | | |

Question Paper Code : 90850

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2022

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. Distinguish between NDT and mechanical testing of materials.
2. List few areas in a foundry where NDT find applications.
3. Mention the role of developers in Liquid penetrant testing.
4. Suggest a method of rapid inspection of mass produced ferromagnetic components.
5. List few limitations of infrared thermography.
6. Mention a reason that makes eddy current testing versatile form of non destructive evaluation.
7. Write notes on pulse-echo mode of ultrasonic testing.
8. What is the main difference between ultrasonic testing and acoustic emission testing?
9. What is the major difference between continuous radiation and characteristic radiation?
10. What is zero radiography?

PART B — (5 × 13 = 65 marks)

11. (a) Present an overview of Non-destructive testing methods for the detection of various types of defects in industries. (13)

Or

(b) Explain the uses of various optical aids for visual inspection stating their applications in various fields. (13)

12. (a) Explain the steps involved in Liquid penetrant testing with neat sketches. (13)

Or

(b) Describe the procedure for Magnetic particle testing with suitable diagrams. (13)

13. (a) Explain the instrumentation of eddy current testing and the cases that suit its applications. (13)

Or

(b) Discuss various industrial scenario that demands thermography for its inspection. (13)

14. (a) Explain the methods of ultrasonic testing with suitable sketches. (13)

Or

(b) (i) Explain the applications of A-scan, B-scan and C-scans of Ultrasonic testing. (8)

(ii) Describe the architecture of an Ultrasonic probe with an illustrative diagram. (5)

15. (a) Explain the production of X-rays with the help of a figure illustrating the basic construction of an X-ray equipment.

Or

(b) (i) Describe the setup for Fluroscopy mentioning its applications. (8)

(ii) Write detailed notes on computed tomography. (5)

PART C — (1 × 15 = 15 marks)

16. (a) Discuss the applications of Eddy current testing in Ship industries and aircraft maintenance.

Or

(b) The tank and pipelines of an oil refinery needs to be periodically inspected. The inspection is generally carried out online. Suggest suitable methods of inspecting the tanks and pipelines for various types of defects.

———————