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

Question Paper Code : 40821

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2021.

Seventh/Eighth Semester

Aeronautical Engineering

ME 8097 — NON DESTRUCTIVE TESTING AND EVALUATION

(Common to Manufacturing Engineering/Mechanical 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 four applications of NDT methods.
2. What are the objectives of non-destructive testing?
3. State the desirable characteristics of a good developer.
4. What types of defects can be detected in a liquid penetrant test?
5. State at least two properties of eddy current.
6. Enumerate the instruments used for infrared detection.
7. What is the significance of couplant in ultrasonic testing?
8. List the different modes of ultrasonic waves.
9. What is need for exposure chart in radiography?
10. What is film contrast in radiography testing?

PART B — (5 × 13 = 65 marks)

11. (a) Describe the Testing Methods in detail for material characterization. (13)

Or

(b) Explain the various optical aids in visual inspection. (13)

12. (a) Explain how the liquid penetrant test be used to detect surface discontinuities? Explain the various stages of liquid penetrant testing procedure. (13)

Or

(b) Discuss about longitudinal magnetization and circumferential magnetization in magnetic particle testing with neat sketch. (13)

13. (a) Explain the eddy current and ultrasonic based NDT methods to analyze the flaws in pipe fittings. (13)

Or

(b) Explain the instrumentation and various methods of thermography inspection. (13)

14. (a) Explain various components involved in ultrasonic testing equipment with block diagram. (13)

Or

(b) Discuss about the time of flight diffraction and phased array techniques of ultrasonic testing with neat figures? (13)

15. (a) Brief write about the following phenomena during interaction of X-ray with matter:

(i) Photoelectric effect

(ii) Compton scattering

(iii) Pair production and

(iv) Thomson scattering (13)

Or

(b) How computed radiography differs from conventional radiography? Briefly write about the principle of operation of computed radiography with neat sketch. (13)

PART C — (1 × 15 = 15 marks)

16. (a) Explain the different scan modes of ultrasonic testing. Discuss the use of UT to inspect porosity/cavity in materials. (15)

Or

(b) Explain the classification of X-ray films used in industrial radiography. Discuss briefly the construction of X-ray film with simple line diagram. (15)

———————