

CS/B.TECH/AUE/ODD SEM/SEM-7/AUE-705A/2016-17

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Paper Code : AUE-705A

NON-DESTRUCTIVE TESTING METHOD

Time Allotted : 3 Hours

Full Marks : 70

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

GROUP - A

(Multiple Choice Type Questions)

1. Choose the correct alternatives for the following : 10 × 1 = 10
- i) The time period during which penetrant remains on the surface of the test piece is called :
 - a) Dwell time b) Soaking time
 - c) Fixing time d) Development time.
 - ii) Magnetic particle inspection is not a reliable method of detecting
 - a) laps b) deep seated cavities
 - c) cracks d) seams.
 - iii) A cross-section view of a test piece is produced by which of the following ?
 - a) A scan b) B scan
 - c) C scan d) A time line display.

- iv) An advantage of using lower frequencies during ultrasonic testing is that
 - a) near surface resolution is improved
 - b) sensitivity to small discontinuities is improved
 - c) beam spread is reduced
 - d) sensitivity to unfavourable oriented flaws is improved.
- v) Typical frequencies which might be used to perform ultrasonic testing of concrete are
 - a) 25 to 100 kHz b) 200 kHz to 5 MHz
 - c) 1 MHz to 5 MHz d) 2.25 MHz to 10 MHz.
- vi) Acoustic emission testing
 - a) is an active testing
 - b) is a passive testing
 - c) may be active or passive
 - d) none of these.
- vii) In Eddy current testing depth of penetration is limited to
 - a) 2 mm b) 6 mm
 - c) 4 mm d) 8 mm.
- viii) Eddy current testing method may be used for
 - a) sorting materials
 - b) measuring thin coating
 - c) measuring thin coating
 - d) all of these.

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- ix) Magnetic particle testing is applicable to
 - a) Ferromagnetic material
 - b) Copper material
 - c) Aluminium material
 - d) all of these.
- x) The limitation of liquid penetrate test is
 - a) only surface breaking discontinuities can be detected
 - b) porous materials cannot be tested.

GROUP - B

(Short Answer Type Questions)

Answer any *three* of the following. 3 × 5 = 15

- 2. Compare destructive testing with non-destructive testing.
- 3. What are the advantages and disadvantages of visual testing ?
- 4. What are the advantages and disadvantages of Acoustic Emission Testing (A.E.T.) ?
- 5. Describe the operating variables affecting the performance in Eddy current inspection.
- 6. What is Acoustic Emission Technique ? Explain with a neat diagram.

GROUP - C

(Long Answer Type Questions)

Answer any *three* of the following. 3 × 15 = 45

- 7. a) With a neat sketch explain the steps involved in liquid penetrant testing.
- b) Explain different types of transducers used ultrasonic inspection.
- c) Explain the procedure of visual inspection test and acceptance criteria of job. 5 + 5 + 5
- 8. a) Write down the principle of ultrasonic testing (U.T.).
- b) Give the advantage and disadvantage of ultrasonic testing (U.T.).
- c) Explain the following :
 - i) Immersion type search unit
 - ii) Contact type search. 4 + 5 + 6
- 9. a) What are the advantages of using ultrasonic inspection as compared to the X-ray radiography ?
- b) Give the advantage and disadvantage of thermography testing (T.T.).
- c) Explain the importance of coupling used in ultrasonic inspection. 5 + 5 + 5
- 10. a) Explain briefly the various defects developed during manufacturing process.
- b) Explain, with sketches, how the following components are inspected using MPI.
 - i) Castings and forgings
 - ii) Hollow cylinder.
- c) Give examples of applications of T.T. and AET. 5 + 5 + 5
- 11. Write short notes on the following : 3 × 5
 - a) Visual Testing
 - b) Advantage and disadvantage of Liquid penetration testing
 - c) Magnetic particle testing.