

19/11/15

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B.E / B.Tech (Full Time) DEGREE END SEMESTER EXAMINATIONS, NOV / DEC 2013

Materials Science & Engineering
Semester VII

ML 9402- Non Destructive Testing

(Regulation 2008)

12

Time: 3 Hours

Answer ALL Questions

Max. Marks 100

PART-A (10 x 2 = 20 Marks)

1. Write the classification of different Liquid Penetrant Testing methods
2. What is circular magnetization? In which direction the defects present would be easily detectable in circular magnetization. Explain with Sketches.
3. What is black light? What is the main use of Black Light in NDT Testing?
4. Write down some of the disadvantages of Radiographic Testing
5. How the minimum SFD in RT Technique is being calculated?
6. Define sensitivity and Density in Radiographs.
7. Why angles of probes used in UT are within specific Limits?
8. State the importance of Using Calibration blocks in UT
9. What are the factors affecting Eddy Current Testing
10. What are the limitations of Eddy Current Testing?

Part – B (5 x 16 = 80 marks)

11. How the welding Inspection on Butt weld Joints is being performed in UT? What are the precautions to be followed on Weld Inspection while performing UT with respect to ASME Standards. Draw necessary sketches and echo levels on drawing DAC curve with the reference Block of T-24 mm having 3mm dia Hole at $\frac{1}{4}$ T and $\frac{1}{2}$ T at its ends.
12. a) How Liquid Penetration Testing is being performed on the test specimens with Fluorescent Type penetrants? What are the limitations of Liquid Penetrant Inspection?
(OR)
b) Why Magnetic Particle Inspection cannot be performed on certain Stainless Steel Materials? Which MPI Technique is the most sensitivity for detecting Sub surface defects. What are the characteristics of Magnetic Testing Powders?
13. a) A Steel alloy pipe of outer dia 219 mm and thickness 30 mm requires Radiographic Testing on its butt weld with X ray source with the focal size 3mm. Brief out Radiographic Test procedure with the required details like RT Technique, SFD, Exposure Time with the help of Exposure Chart as provided and Penetrameter selection on ASTM Hole type to obtain the sensitivity of 2%.
(OR)
b) i). Discuss the advantages and disadvantages of Eddy Current Testing
ii). Explain in details the Lift off and Fill factor in Eddy Current testing

contd-2-

14. a) Explain briefly 1).Near Zone,2).Dead Zone,3).Franhofer Zone,4).Angle of Beam spread in UT with necessary sketches.
(OR)
- b) Draw V1 and V2 Blocks with necessary dimension details. How the range setting is made in UT with V1 and V2 Blocks esp for setting the ranges of 250 mm and 375 mm with angle probe in CRT Screen. Draw sketches with Echo Heights observed with V1 and V2 Calibration blocks.
15. a) Discuss in details TOFD and Phased array Techniques in UT.
(OR)
- b) List out various Welding defects that normally occurred. What are the defects traceable in Steel Plates, Forging, welding & Castings by RT and UT?.

X Ray Exposure Chart for Question No 13-a).

X Ray Chart Drawn at SFD of 700mm

