

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 2940

Roll No.

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**B.Tech.**

(SEM. VIII) EVEN THEORY EXAMINATION 2012-13

**NON-DESTRUCTIVE TESTING**

*Time : 3 Hours*

*Total Marks : 100*

**Note :-** (1) Attempt all questions.

(2) All questions carry equal marks.

(3) Be precise in your answers.

1. Attempt any **four** parts of the following : **(5×4=20)**

(a) Differentiate between destructive and nondestructive testing methods.

(b) Discuss the scope and advantages of Non Destructive Testing.

(c) What are defects ? Discuss any five defects which can only be detected by NDT methods only.

(d) Discuss the various equipments involved in visual inspection.

(e) Briefly describe the oil and whiting test.

(f) Explain the working principle of hammer test. What are its limitations ?

2. Attempt any **two** parts of the following : **(10×2=20)**

(a) Briefly explain the basic principle of magnetic particle inspection. What are magnetization and demagnetization ?

Discuss the techniques used for them.

- (b) Write a short note on the classification of magnetic materials. How do they affect the process of magnetic particle inspection? Also discuss the role of magnetic field orientation in flaw detection.
- (c) What is the role of penetrant in liquid penetrant inspection? Discuss the important properties of penetrants and safety precautions related to them.
3. Attempt any **two** parts of the following : **(10×2=20)**
- (a) Briefly discuss the various kind of radiations. Differentiate the x-ray radiation from gamma radiations. What are the advantages of gamma radiation over x-ray radiation?
- (b) Explain the following terms related with radiographic inspection :
- Photoelectric effect
  - Compton's effect and
  - Thomson Scattering.
- (c) Differentiate between radiographic contrast and radiographic definition using neat sketches.
4. Attempt any **two** parts of the following : **(10×2=20)**
- (a) Briefly discuss various probes used in ultrasonic flaw detection. What are the advantages and disadvantages of UT.
- (b) What are different techniques of data presentation in UT? Elaborate them with the help of neat sketches along with their importance in inspection process.
- (c) Briefly discuss the following about ultrasonic inspection :
- Calibration of ultrasonic instruments
  - Pulse echo method.

5. Attempt any **two** parts of the following : **(10×2=20)**
- (a) Write short notes about the following eddy current probes :
- Surface probe
  - Differential probes
  - Absolute probes
- (b) With a suitable example explain the magnetic particle wet fluorescent inspection of a crack in a casting.
- (c) Briefly discuss the following about eddy current inspection :
- Inspection of tubes of a heat exchanger
  - Fatigue crack inspection.