

(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 :
- (i) Photoelectric effect
 - (ii) Compton's effect and
 - (iii) 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 :
- (i) Calibration of ultrasonic instruments
 - (ii) Pulse echo method.

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

(a) Write short notes about the following eddy current probes :

- (i) Surface probe
- (ii) Differential probes
- (iii) 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 :

- (i) Inspection of tubes of a heat exchanger
- (ii) Fatigue crack inspection.