

GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER-VII • EXAMINATION – SUMMER • 2014

Subject Code: 172102**Date: 03-06-2014****Subject Name: Non Destructive Testing****Time: 02:30 pm - 05:00 pm****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1 (a)** What is meant by visual inspection of materials/ component? Explain the role of visual inspection in non destructive testing giving suitable examples. **07**
- (b)** A cross country crude oil pipe line is to be tested for leakage. What NDT technique is to be used and why? Explain the principle of the technique and the procedure. **07**
- Q.2 (a)** Draw a neat sketch of Helium leak detector and explain its working. Where and how it is used? **07**
- (b)** Write a short note on Acoustic Emission Technique. **07**
- OR**
- (b)** Give the names of a few visual aids and their uses in NDT **07**
- Q.3 (a)** Discuss liquid penetrant Testing with reference to **07**
 i) Steps of operation **(2+2+2+1)**
 ii) Principle
 iii) Different types of penetrant
 iv) Limitations.
- (b)** Discuss Magnetic Particle Testing with reference to **07**
 i) Steps of Operation **(2+2+2+1)**
 ii) Principle
 iii) Method of Magnetization
 iv) Limitations
- OR**
- Q.3 (a)** Explain the following terms **07**
 i) Piezoelectric properties **(2+2+2+1)**
 ii) Acoustic properties
 iii) Geometrical unsharpness
 iv) Non Destructive Testing
- (b)** Discuss in brief the pulse echo ultrasonic testing technique and its application. **07**
- Q.4 (a)** Explain the principle, application and disadvantages of Radiographic Testing. **07**
- (b)** Name various defects found in casting & forgings. How will you identify them? **07**
- OR**
- Q.4 (a)** What are filters and screens used in X- ray radiography? Why are they used? **07**
- Q.4 (b)** Write a brief note on Radiographic film and its processing. **07**

- Q.5 (a)** What is the principle of Eddy current testing? **07**
(b) Discuss various applications of eddy current testing? **07**

OR

- Q.5 (a)** What NDT techniques you would like to employ for the following cases. **07**
- i) Testing of heat exchanger tube for leakage.
 - ii) Measurement of coating thickness on mild steel sheet.
 - iii) Change in thickness of a domestic galvanized water pipe line.
 - iv) Quench cracks on hardened steel.
 - v) Inclusion in stainless steel casting.
 - vi) Porosity in welded joints.
 - vii) Hairline cracks on ceramic tiles.
- (b)** Discuss various test coils used in Eddy current testing. **07**
