

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER– VI (NEW) EXAMINATION – WINTER 2021****Subject Code:3161923****Date:04/12/2021****Subject Name:Non destructive Testing****Time:10:30 AM TO 01:00 PM****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

- Q.1**
- (a) Why and how demagnetization is carried out? **03**
  - (b) Highlight the use of Borescope in visual testing. **04**
  - (c) Discuss briefly about selection of different NDT techniques for detection of defects. **07**
- Q.2**
- (a) What is capillary action and dwelling time in DPT. **03**
  - (b) What are different types of sound waves? Explain. **04**
  - (c) State principle of liquid penetrant testing (LPT) and with neat sketch explain different steps of LPT. **07**
- OR**
- (c) Explain principle of leak testing and discuss Helium leak detection techniques with neat sketch. **07**
- Q.3**
- (a) Briefly explain thermal methods for NDT. **03**
  - (b) Explain principle of magnetic particle testing and its limitations. **04**
  - (c) Explain principle of Radiographic Testing and give its application and limitations. **07**
- OR**
- Q.3**
- (a) List applications of Acoustic Emission Testing. **03**
  - (b) Write a brief note on (a) Penetrants (b) developers. **04**
  - (c) With the help of a diagram explain the Pulse echo technique of Ultrasonic Testing. **07**
- Q.4**
- (a) Explain X Ray film processing. **03**
  - (b) What is the use of penetrometer in Radiographic Testing? **04**
  - (c) Write short note on X-ray generation with neat sketch in RT. **07**
- OR**
- Q.4**
- (a) What is leak and its different types? **03**
  - (b) Compare advantages and limitation of Ultrasonic and Radiography testing. **04**
  - (c) Write a short note on Eddy current testing. **07**
- Q.5**
- (a) Define geometric unsharpness (Ug) and write note on radiographic film. **03**
  - (b) Write note on piezoelectricity. **04**
  - (c) With neat sketch explain different types of ultrasonic probes. **07**
- OR**
- Q.5**
- (a) What do you understand by sensitivity in Eddy current testing? **03**
  - (b) Explain the term 'Film contrast' and 'subject contrast' in radiography. **04**
  - (c) What is couplant in ultrasonic testing? What is its role? State its advantages and disadvantages. **07**

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**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER-VI (NEW) EXAMINATION – SUMMER 2022****Subject Code:3161923****Date:10/06/2022****Subject Name:Non destructive Testing****Time:10:30 AM TO 01:00 PM****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

- Q.1** (a) Give the names of all destructive and non-destructive testing commonly carried out. **03**  
(b) List the typical characteristics of penetrant and developer in LPT. **04**  
(c) What is visual examination? Explain visual examination method using borescope. **07**

- Q.2** (a) Why and how demagnetization is carried out? **03**  
(b) Discuss advantages and limitations of eddy current testing. **04**  
(c) State principle of liquid penetrant testing (LPT) and with neat sketch explains different steps of LPT. **07**

**OR**

- (c) What is couplant in ultrasonic testing? What is its role? State its advantages and disadvantages. **07**

- Q.3** (a) What is contact angle, capillary action and dwelling time in LPT? **03**  
(b) Explain principle of magnetic particle testing and its limitations. **04**  
(c) With the help of a diagram explain the Pulse echo technique of Ultrasonic testing. **07**

**OR**

- Q.3** (a) List out properties of X-rays and Gamma rays. **03**  
(b) Give salient features of acoustic emission technique. **04**  
(c) Which method is best suited for institute inspection of a pipe line of a refinery? Why? **07**

- Q.4** (a) Discuss advantages and limitations of X-ray radiography. **03**  
(b) What is the use of penetrometer in radiographic testing? **04**  
(c) Explain ultrasonic testing (UT) A-scan, B-scan and C-scan. **07**

**OR**

- Q.4** (a) State safety precaution in Industrial radiography. **03**  
(b) What are different types of sound waves? Explain. **04**  
(c) Discuss the use of radiography testing (RT) in the field of welding. Draw and explain the types of defects that can be observed during the same. **07**

- Q.5** (a) Define geometric unsharpness (Ug) and write note on radiographic film. **03**  
(b) Compare advantages and limitation of ultrasonic and radiography testing. **04**  
(c) Discuss techniques and applications of thermography. **07**

**OR**

- Q.5** (a) What is leak and its different types? **03**  
(b) Explain principle of eddy current testing (ECT). **04**  
(c) Explain in brief the leak testing of heat exchanger tubes in a boiler. **07**

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