

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER-VI (NEW) EXAMINATION – WINTER 2024

Subject Code:3161923

Date:05-12-2024

Subject Name: Non destructive Testing

Time:02:30 PM TO 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.
4. Simple and non-programmable scientific calculators are allowed.

- Q.1** (a) What is visual examination? Explain visual examination method using borescope. **07**
(b) State the principle of liquid penetrant testing. Discuss the various steps involved in the liquid penetrant testing (LPT). **07**
- Q.2** (a) Explain the principle of Dye penetrant testing (DPT). Mention the application and limitation for same. **07**
(b) List out and discuss briefly different MPT equipment. **07**
- OR**
- (b) Explain in details various steps involved in magnetic particle testing? **07**
- Q.3** (a) Distinguish between A-Scan, B-Scan, and C-Scan presentation in ultrasonic testing. **07**
(b) Give salient features of acoustic emission technique. **07**
- OR**
- Q.3** (a) State the basic principle, advantages, limitations and applications of ultrasonic testing method. **07**
(b) Explain use of ultrasonic testing (UT) in field of welding with types of defects that can be detected during the same. **07**
- Q.4** (a) Explain the Radiographic Testing method. **07**
(b) Explain in brief the leak testing of heat exchanger tubes in a boiler. **07**
- OR**
- Q.4** (a) 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**
(b) Explain in brief about pressure decay and vacuum decay leak testing. **07**
- Q.5** (a) Explain in brief Eddy Current Testing. **07**
(b) Explain safety precautions to be taken during Radiographic testing (RT). **07**
- OR**
- Q.5** (a) Discuss techniques and applications of thermography. **07**
(b) Describe the significance of flux produced in Eddy Current Testing. **07**

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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) Outline the circular magnetization used in Magnetic Particle Testing **03**
(b) What is the dwell time in Liquid Penetrant Testing? Mention the reasons for provision of dwell time. **04**
(c) Choose the correct method to detect the porosity within few mm depth from surface in ferromagnetic material. Explain the method with neat sketch **07**
- Q.2** (a) Brief about the emulsifiers used in liquid penetrant testing **03**
(b) Describe the significance of different current sources used in Magnetic Particle Testing **04**
(c) Choose the correct method to detect the surface discontinuity in large size component **07**
- OR**
- Q.3** (c) What are the advantages, limitations and applications of Liquid Penetrant Testing method **07**
(a) Illustrate the sensitivity of Ultra sonic testing method **03**
(b) Describe the advantages, limitations of Eddy Current Testing **04**
(c) Determine the correct method to detect and identify the size of volumetric defects **07**
- OR**
- Q.3** (a) Illustrate the sensitivity of Eddy current testing **03**
(b) Describe the advantages, limitations of Ultrasonic Testing Method **04**
(c) Decide the correct method used to detect and identify the size of interior defects **07**
- Q.4** (a) Enlist the applications of radiographic inspection **03**
(b) Describe the significance of Angle beam Pulse Echo Testing **04**
(c) Choose the correct method to detect the inclusions in multiple components at a time **07**
- OR**
- Q.4** (a) Outline the advantages and limitations of bubble testing for leakage detection **03**
(b) Examine the sources used in Radiographic Testing. What type of precautions are required? **04**
(c) Explain the Radiographic Testing method **07**
- Q.5** (a) Outline the Holography method **03**
(b) Enlist the various Leak Detection techniques. Describe anyone. **04**
(c) Explain in brief Eddy Current Testing. **07**
- OR**
- Q.5** (a) Compare the destructive and non-destructive testing. **03**
(b) Brief the sniffing technique of leak detection **04**
(c) Describe the significance of flux produced in Eddy Current Testing **07**

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VI(NEW) EXAMINATION – WINTER 2022****Subject Code:3161923****Date:17-12-2022****Subject Name:Non destructive Testing****Time:02:30 PM TO 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.
4. Simple and non-programmable scientific calculators are allowed.

- Q.1** (a) State the objectives of non-destructive testing. List out the NDT methods. **03**
(b) Distinguish between aided and unaided visual testing method. **04**
(c) State the principle of liquid penetrant testing. Discuss the various steps involved in the liquid penetrant testing (LPT). **07**

- Q.2** (a) What is a longitudinal magnetization and circumferential magnetization in magnetic particle testing (MPT)? **03**
(b) What are the different methods of penetrant application? **04**
(c) Explain in details various steps involved in magnetic particle testing? **07**

OR

- (c) Distinguish between A-Scan, B-Scan, and C-Scan presentation in ultrasonic testing. **07**

- Q.3** (a) List the desirable characteristics of a good developer in LPT. **03**
(b) Explain eddy current testing working principle. **04**
(c) State the basic principle, advantages, limitations and applications of ultrasonic testing method. **07**

OR

- Q.3** (a) Explain briefly the gamma ray radiographic testing. **03**
(b) List out factors influencing the selection of ultrasonic transducer. Classify ultrasonic transducers. **04**
(c) Explain with sketch, the working principle of X-ray radiography and state its advantages, limitations and applications. **07**

- Q.4** (a) Discuss the uses of penetrometer in radiographic testing. **03**
(b) What do you mean by film graininess, film contrast and geometric unsharpness in radiography testing? **04**
(c) How the pulse-echo method of ultrasonic inspection is carried out? State the advantages and disadvantages of pulse echo method. **07**

OR

- Q.4** (a) What is a lift off effect, edge effect and end effect in eddy current testing? **03**
(b) What are the advantages and limitations of thermography testing? **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) What is leak testing? What are the methods of leak testing? **03**
(b) Difference between the fluorescent and visible penetrants. **04**
(c) Discuss the application of eddy current testing method for crack detection, Non-conductive coatings and material thickness measurement. **07**

OR

- Q.5** (a) Explain different type of magnetic particles used in MPT. **03**

- (b) Explain working principle of acoustic emission testing with a neat sketch. **04**
- (c) Explain in brief about pressure decay and vacuum decay leak testing. **07**
