

GUJARAT TECHNOLOGICAL UNIVERSITY

BE-6 SEMESTER – OLD PAPER – S22 TO W25 – QUESTION BANK

Subject Name & Code:

NONDESTRUCTIVE TESTING- 3161923

Unit 1: Introduction to NDT & Visual Testing

Repeated Questions:

1. **State the principle of liquid penetrant testing (LPT). Discuss the various steps involved in LPT.**
(W24 - Q1b, 07 marks)
(S25 - Q1c, 07 marks)
(W22 - Q1c, 07 marks)
(S24 - Q1c, 07 marks)
2. **What is visual examination? Explain visual examination method using borescope.**
(S22 - Q1c, 07 marks)
(W24 - Q1a, 07 marks)
3. **Differentiate between destructive and non-destructive testing.**
(S25 - Q1a, 03 marks)
(S22 - Q1a, 03 marks)
4. **List the names of all destructive and non-destructive testing commonly carried out.**
(S22 - Q1a, 03 marks)
(S24 - Q1a, 03 marks)
5. **State the objectives of non-destructive testing.**
(W22 - Q1a, 03 marks)
(S24 - Q1a, 03 marks)

Other Important Questions (Newest to Oldest):

6. **Outline the circular magnetization used in Magnetic Particle Testing.** (W23 - Q1a, 03 marks)
 7. **Outline the Holography method.** (W23 - Q5a, 03 marks)
 8. **Brief about the emulsifiers used in liquid penetrant testing.** (W23 - Q2a, 03 marks)
 9. **Enlist different tools used in Visual Inspection and explain constructional working of borescope used in visual inspection with neat sketch.** (W22 - Q1c, 07 marks)
 10. **Discuss principle of visual testing and its limitations.** (S24 - Q1b, 04 marks)
 11. **Distinguish between aided and unaided visual testing method.** (S24 - Q1b, 04 marks)
 12. **Highlight the use of Borescope in visual testing.** (S25 - Q1b, 04 marks)
 13. **Briefly give application and limitations of Visual Testing.** (S25 - Q2a, 03 marks)
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Unit 2: Liquid Penetrant Testing (LPT)

Repeated Questions:

1. **What is contact angle, capillary action and dwell time in LPT?**
(S22 - Q3a, 03 marks)
(S24 - Q2a, 03 marks)
2. **List the typical characteristics of penetrant and developer in LPT.**
(S22 - Q1b, 03 marks)
(S24 - Q3b, 03 marks)
3. **Give the applications and limitations of LPT.**
(S24 - Q2b, 03 marks)
(S22 - Q3c OR, 03 marks)
4. **Explain the principle of Dye Penetrant Testing (DPT). Mention the application and limitation for same.**
(W24 - Q2a, 07 marks)
(W22 - Q2c OR, 07 marks)

Other Important Questions (Newest to Oldest):

5. **What is the dwell time in Liquid Penetrant Testing? Mention the reasons for provision of dwell time.** (W23 - Q1b, 04 marks)
 6. **What are the advantages, limitations and applications of Liquid Penetrant Testing method?** (W23 - Q3a, 07 marks)
 7. **Define developer. Describe standard forms of developers used in dye penetrant testing (DPT).** (W22 - Q1b, 04 marks)
 8. **List the desirable characteristics of a good developer in LPT.** (S24 - Q3a, 03 marks)
 9. **What are the different methods of penetrant application?** (S24 - Q2b, 04 marks)
 10. **Difference between the fluorescent and visible penetrants.** (S25 - Q3a, 03 marks)
 11. **Define terms related to dye penetrant testing (DPT): 1) Capillary action 2) Dwell time 3) Contact angle.** (W22 - Q3a, 03 marks)
 12. **Explain the different methods of penetrant application?** (S25 - Q5c OR, 07 marks)
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Unit 3: Magnetic Particle Testing (MPT)

Repeated Questions:

1. **Explain in detail various steps involved in magnetic particle testing.**
(W24 - Q2b OR, 07 marks)
(S24 - Q2c, 07 marks)
2. **List out and discuss briefly different MPT equipment.**
(W24 - Q2b, 07 marks)
(S24 - Q2c, 07 marks)
3. **List the advantages and disadvantages of Magnetic Particle Testing (MPT).**
(W22 - Q2a, 03 marks)
(S24 - Q2a, 03 marks)

Other Important Questions (Newest to Oldest):

4. **Describe the significance of different current sources used in Magnetic Particle Testing.** (W23 - Q2b, 04 marks)
 5. **What is longitudinal magnetization and circumferential magnetization in MPT?** (S24 - Q2a, 03 marks)
 6. **Explain indirect magnetization method in magnetic particle testing (MPT).** (W22 - Q3b, 04 marks)
 7. **Why and how demagnetization is carried out?** (S22 - Q2a, 03 marks)
 8. **Explain different type of magnetic particles used in MPT.** (S25 - Q4a, 03 marks)
 9. **Explain procedure of Magnetic Particle Testing.** (S24 - Q2c OR, 07 marks)
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Unit 4: Ultrasonic Testing (UT)

Repeated Questions:

1. **Distinguish between A-Scan, B-Scan, and C-Scan presentation in ultrasonic testing.**
(W24 - Q3a, 07 marks)
(S24 - Q2c OR, 07 marks)
(S25 - Q2c OR, 07 marks)
2. **Explain pulse echo technique for Ultrasonic Testing (UT) method with neat diagram.**
(W22 - Q2c, 07 marks)
(S24 - Q3c, 07 marks)
3. **State the basic principle, advantages, limitations and applications of ultrasonic testing method.**
(W24 - Q3a OR, 07 marks)
(S24 - Q3c, 07 marks)
4. **Explain UT A-scan, B-scan and C-scan.**
(S22 - Q4c OR, 07 marks)
(S25 - Q2c OR, 07 marks)
5. **What are different types of sound waves? Explain.**
(S22 - Q4b OR, 04 marks)
(S24 - Q3a, 03 marks)
(S25 - Q4b OR, 04 marks)

Other Important Questions (Newest to Oldest):

6. **Illustrate the sensitivity of Ultrasonic testing method.** (W23 - Q3b, 03 marks)
 7. **Describe the advantages, limitations of Ultrasonic Testing Method.** (W23 - Q3b, 04 marks)
 8. **What is couplant in ultrasonic testing? What is its role? State its advantages and disadvantages.** (S22 - Q2c OR, 07 marks)
 9. **With the help of a diagram explain the Pulse echo technique of Ultrasonic testing.** (S22 - Q3c, 07 marks)
 10. **Explain use of ultrasonic testing (UT) in field of welding with types of defects that can be detected during the same.** (W24 - Q3b, 07 marks)
 11. **Draw neat sketch of Normal, TR and Angle probes and standard test block used for ultrasonic testing.** (S25 - Q2c, 07 marks)
 12. **How the pulse-echo method of ultrasonic inspection is carried out? State the advantages and disadvantages of pulse echo method.** (S25 - Q3c, 07 marks)
 13. **List out factors influencing the selection of ultrasonic transducer. Classify ultrasonic transducers.** (S25 - Q5b OR, 04 marks)
 14. **Explain straight beam and angle beam testing techniques used in ultrasonic testing (UT).** (W22 - Q3c, 07 marks)
 15. **Describe the significance of Angle beam Pulse Echo Testing.** (W23 - Q4b, 04 marks)
 16. **Explain near zone, far zone and transition zone in UT.** (S25 - Q4c OR, 07 marks)
 17. **Explain any two methods of coupling in ultrasonic testing (UT).** (W22 - Q4b, 04 marks)
 18. **List the advantages and limitations of UT.** (S24 - Q4a OR, 03 marks)
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Unit 5: Radiographic Testing (RT)

Repeated Questions:

1. **Explain the Radiographic Testing method.**
(W23 - Q4c, 07 marks)
(W24 - Q4a, 07 marks)
2. **Discuss the use of radiography testing (RT) in the field of welding. Draw and explain the types of defects that can be observed.**
(S22 - Q4c OR, 07 marks)
(W24 - Q4a OR, 07 marks)
(S24 - Q4c OR, 07 marks)
3. **State safety precaution in Industrial radiography.**
(S22 - Q4a OR, 03 marks)
(S24 - Q5a OR, 03 marks)
(W24 - Q5b, 07 marks)
4. **List out properties of X-rays and Gamma rays.**
(S22 - Q3a OR, 03 marks)
(S25 - Q4a OR, 03 marks)
5. **Discuss advantages and limitations of X-ray radiography.**
(S22 - Q4a, 03 marks)
(S24 - Q4a, 03 marks)

Other Important Questions (Newest to Oldest):

6. **Enlist the applications of radiographic inspection.** (W23 - Q4a, 03 marks)
 7. **Examine the sources used in Radiographic Testing. What type of precautions are required?** (W23 - Q4b, 04 marks)
 8. **What is the use of penetrometer in radiographic testing?** (S22 - Q4b, 03 marks)
 9. **Define geometric unsharpness (Ug) and write note on radiographic film.** (S22 - Q5a, 03 marks)
 10. **Write short note on radiographic film used in Radiographic testing (RT) with neat sketch.** (W22 - Q3a, 03 marks)
 11. **Explain basic principle of Radiographic examination.** (S24 - Q4b, 03 marks)
 12. **Differentiate between X-ray & Gamma-ray radiographic testing.** (S24 - Q4c, 07 marks)
 13. **Explain with sketch, the working principle of X-ray radiography and state its advantages, limitations and applications.** (S24 - Q3c OR, 07 marks)
 14. **Discuss the uses of penetrometer in radiographic testing.** (S24 - Q4a, 03 marks)
 15. **What do you mean by film graininess, film contrast and geometric un-sharpness in radiography testing?** (S24 - Q4b, 04 marks)
 16. **How the quality of a good radiograph is accessed?** (W22 - Q4a, 03 marks)
 17. **Explain the process of radiography testing (RT) using Cobalt 60 isotope.** (W22 - Q4c OR, 07 marks)
 18. **What are the prime advantages of Radiographic Examination during NDT?** (W22 - Q5a, 03 marks)
 19. **Explain X Ray film processing.** (S24 - Q5b OR, 03 marks)
 20. **Explain SWSI and DWSI inspection techniques in radiographic testing (RT).** (W22 - Q5c OR, 07 marks)
 21. **Explain briefly the gamma ray radiographic testing.** (S24 - Q3a OR, 03 marks)
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Unit 6: Eddy Current Testing (ECT)

Repeated Questions:

1. **Explain in brief Eddy Current Testing.**
(W23 - Q5c, 07 marks)
(W24 - Q5a, 07 marks)
2. **Describe the advantages, limitations of Eddy Current Testing.**
(W23 - Q3b, 04 marks)
(S22 - Q2b, 03 marks)
(W22 - Q5b OR, 03 marks)
3. **Explain principle of eddy current testing.**
(S25 - Q3b, 04 marks)
(S22 - Q5b OR, 04 marks)
4. **Describe the significance of flux produced in Eddy Current Testing.**
(W23 - Q5c OR, 07 marks)
(W24 - Q5b OR, 07 marks)

Other Important Questions (Newest to Oldest):

5. **Illustrate the sensitivity of Eddy current testing.** (W23 - Q3a, 03 marks)
 6. **Discuss factors affecting the Eddy current testing (ECT).** (W22 - Q2b, 04 marks)
 7. **What is a lift off effect, edge effect and end effect in eddy current testing?** (S24 - Q4a OR, 03 marks)
 8. **What do you understand by sensitivity in ECT?** (S24 - Q5a, 03 marks)
 9. **Discuss the application of eddy current testing method for crack detection, non-conductive coatings and material thickness measurement.** (S24 - Q5c, 07 marks)
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Unit 7: Leak Testing & Other NDT Methods

Repeated Questions:

1. **Explain in brief the leak testing of heat exchanger tubes in a boiler.**
(S22 - Q5c OR, 07 marks)
(W24 - Q4b, 07 marks)
(S25 - Q3c OR, 07 marks)
2. **What is leak testing? What are the methods of leak testing?**
(S25 - Q4b, 04 marks)
(S24 - Q5a, 03 marks)
3. **Explain in brief about pressure decay and vacuum decay leak testing.**
(S25 - Q5c, 07 marks)
(W24 - Q4b OR, 07 marks)
(S24 - Q5c OR, 07 marks)
4. **What is leak and its different types?**
(S22 - Q5a OR, 03 marks)
(S25 - Q5a, 03 marks)

Other Important Questions (Newest to Oldest):

5. **Enlist the various Leak Detection techniques. Describe anyone.** (W23 - Q5b, 04 marks)
 6. **Compare the destructive and non-destructive testing.** (W23 - Q5a OR, 03 marks)
 7. **Brief the sniffing technique of leak detection.** (W23 - Q5b OR, 04 marks)
 8. **Outline the advantages and limitations of bubble testing for leakage detection.** (W23 - Q4a OR, 03 marks)
 9. **Explain Leak and Pressure testing techniques. What are its applications?** (S24 - Q5c OR, 07 marks)
 10. **Explain principle of leak testing and discuss Helium leak detection techniques with neat sketch.** (S25 - Q4c, 07 marks)
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Unit 8: Advanced & Miscellaneous NDT Methods

Repeated Questions:

1. **Discuss techniques and applications of thermography.**
(S22 - Q5c, 07 marks)
(W24 - Q5a OR, 07 marks)
2. **Give salient features of acoustic emission technique.**
(S22 - Q3b OR, 04 marks)
(W24 - Q3b, 07 marks)
(S25 - Q5b, 04 marks)

Other Important Questions (Newest to Oldest):

3. **What are the advantages and limitations of thermography testing?** (S25 - Q3b, 04 marks)
4. **Explain working principle of acoustic emission testing with a neat sketch.** (S24 - Q5b OR, 04 marks)
5. **Explain the principle of Acoustic Emission Testing (AET) with line diagram. Write applications & advantages of AET.** (S24 - Q3c, 07 marks)
6. **Explain any four factors influencing acoustic wave on propagation and data acquisition in acoustic emission testing (AET).** (W22 - Q3b, 04 marks)
7. **What is the principle of Thermographic Testing? What are its limitations & advantages?** (S24 - Q5c OR, 07 marks)
