

Reg No.: \_\_\_\_\_

Name: \_\_\_\_\_

**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**

B.Tech Degree S6 (R,S) / S4 (PT) (R,S) Examination May 2024 (2019 Scheme)

**Course Code: MET312****Course Name: NON DESTRUCTIVE TESTING****Max. Marks: 100****Duration: 3 Hours****PART A***Answer all questions, each carries 3 marks.*

- |    |  | Marks |
|----|--|-------|
| 1  | What are the objectives of Non Destructive Testing?                        | (3)   |
| 2  | List different defects that are detected by means of visual inspection.    | (3)   |
| 3  | What are the properties of a good developer? .                             | (3)   |
| 4  | What is the principle of Liquid Penetrant Inspection?                      | (3)   |
| 5  | Define the terms "Flux Density" and "Retentivity"                          | (3)   |
| 6  | What are the advantages and disadvantages of Magnetic Particle Inspection? | (3)   |
| 7  | What is A-Scan presentation?   | (3)   |
| 8  | What are the main characteristics of sound waves?                          | (3)   |
| 9  | What are X-rays? What are the properties of X-rays?                        | (3)   |
| 10 | What factors influence eddy current testing?                               | (3)   |

**PART B***Answer any one full question from each module, each carries 14 marks.***Module I**

- 11 a) Explain various application of NDT as an inspection tool. Discuss the economical aspects of NDT. (6)
- b) Differentiate and explain the workings of Borescope and Fibrosopes with neat sketches. (8)

**OR**

- 12 a) Explain the different light sources and special lighting used in a visual inspection system. (6)
- b) Explain the workings, advantages, and disadvantages of a computer-enhanced visual inspection system with a neat figure. (8)

**Module II**

- 13 a) Explain the standard operating procedure used in liquid penetrant testing and mention some examples of indications. (8)

- b) What are the various properties that a good penetrant should possess? Explain with reasons. (6)

OR

- 14 a) What are the different types of developers used in liquid penetrant inspection? List the advantages and disadvantages of each. (8)
- b) Explain water-washable penetrant method, including its merits and disadvantages. (6)

**Module III**

- 15 a) Explain the following magnetization techniques: a) Head Shot Technique, b) Coil Shot Technique. (8)
- b) How does the interpreter classify indications in Magnetic Particle Inspection? Please provide examples to support your explanation. (6)

OR

- 16 a) Explain longitudinal and circular magnetization technique with neat sketch. Explain how it helps to identify the cracks. (6)
- b) Explain continuous testing and residual techniques in Magnetic Particle Inspection. (8)

**Module IV**

- 17 a) What are the advantages and limitations of ultrasonic inspection? (6)
- b) Explain, with a neat sketch, the principle and working of Time of Flight Diffraction. (8)

OR

- 18 a) Explain, Pulse-echo and Immersion testing techniques used in ultrasonic testing. (8)
- b) Explain the transmission technique used in ultrasonic testing. (6)

**Module V**

- 19 a) Explain SWSI and DWSI in radiographic inspection techniques with clear figures. (6)
- b) Explain with real time radiography with the help of neat sketch. (8)

OR

- 20 a) Write short notes on (i) lift effect, (ii) edge effect (iii) end effect (iv) fill factor (8)
- b) Explain the depth of penetration in ECT and its relationship to frequency. (6)

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