

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

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

**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**

Fifth semester B.Tech degree examinations (S) September 2020

**Course Code: ME367****Course Name: NON-DESTRUCTIVE TESTING**

Max. Marks: 100

Duration: 3 Hours

**PART A***Answer any three full questions, each carries 10 marks.*

Marks

- |   |    |  |     |
|---|----|--|-----|
| 1 | a) | Differentiate between Destructive and Non- Destructive Testing with examples.  | (5) |
|   | b) | What are the various applications of NDT?  | (5) |
| 2 | a) | What are the different visual aids used in visual inspection? Explain fibroscope and boroscope in detail.  | (5) |
|   | b) | Explain the working of computer enhanced visual inspection system with a neat diagram.   | (5) |
| 3 | a) | What are the properties required for a good penetrant used in Liquid Penetrant Inspection (LPI)? Differentiate visual penetrants and fluorescent penetrants. | (5) |
|   | b) | What is the use of developer in Liquid Penetrant Inspection? Explain the different types of developers.  | (5) |
| 4 | a) | Define the terms dwell time and development time.  | (2) |
|   | b) | Explain the various methods of Liquid Penetrant Inspection with flow chart.  | (8) |

**PART B***Answer any three full questions, each carries 10 marks.*

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|---|----|--|-----|
| 5 | a) | What is the principle of Magnetic Particle Inspection (MPI)?   | (2) |
|   | b) | Explain the following magnetization techniques used in Magnetic Particle Inspection with neat sketches: (i) Head shot technique (ii) Magnetization using prods (iii) Coil shot technique (iv) Central conductor technique. | (8) |
| 6 | a) | What are magnetic field indicators? Explain the use of Pie gauge in Magnetic Particle Inspection.  | (5) |
|   | b) | List the advantages and disadvantages of Magnetic Particle Inspection.   | (5) |
| 7 | a) | What are the different modes of wave propagation in Ultrasonic Testing (UT)?   | (5) |

- b) Explain immersion testing technique and dual crystal probe testing technique used in Ultrasonic Testing. (5)
- 8 a) Explain the working of piezoelectric transducer with a neat sketch. Write its advantages and disadvantages. (5)
- b) With a neat sketch, explain how Time of Flight Diffraction (TOFD) can be used to detect cracks in a weldment. (5)

### **PART C**

*Answer any four full questions, each carries 10 marks.*

- 9 Explain SWSI, DWSI and DWDI inspection techniques in Radiography Testing (RT) of pipes with neat sketches. (10)
- 10 a) Explain how X- Rays can be produced with a neat sketch. (5)
- b) What are the functions of screens in Radiography Testing? Compare metal foil screen and fluorescent salt screen. (5)
- 11 a) Explain the various criteria's used to assess the quality of a good radiograph. (5)
- b) Differentiate between high speed film and low speed film used in Radiography Testing. (5)
- 12 a) Explain the principle of Eddy Current Testing (ECT). List the properties of eddy current. (5)
- b) What is the relation between frequency and depth of penetration in Eddy Current Testing? (5)
- 13 a) Define lift off effect, edge effect and end effect in Eddy Current Testing. (5)
- b) Compare absolute probes and differential probes used in Eddy Current Testing. (5)
- 14 a) Explain the various applications of Eddy Current Testing. (5)
- b) What are the advantages and limitations of Eddy Current Testing? (5)

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