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## P.E.S. College of Engineering, Mandya - 571 401

(An Autonomous Institution affiliated to VTU, Belgaum)

Seventh Semester, B.E. – Automobile Engineering

Semester End Examination; Dec - 2016/Jan - 2017

### Non-Destructive Testing

Time: 3 hrs

Max. Marks: 100

**Note:** i) Answer **FIVE** full questions, selecting **ONE** full question from each unit.

ii) Figures/ Sketches are to be drawn using pencil only.

#### UNIT - I

- 1a. Explain the advantages and limitations of Destructive tests and Non-Destructive tests. 10
- b. Describe the importance of Leak testing and the different Leak testing methods. 10
- 2 a. Explain the procedure for testing a component using Magnetic particle testing. 10
- b. Explain any two magnetizing techniques. 10

#### UNIT - II

- 3 a. Explain the factors which affect eddy current. 10
- b. Explain the inspection of Heat exchanger tubes by single frequency Eddy current Testing system. 10
- 4 a. Explain principle of operation, measurement technique, data collection and image creation in microwave inspection. 10
- b. Explain the applications and limitations of microwave inspection. 10

#### UNIT - III

- 5 a. Explain briefly about velocity of Ultrasonic waves and behavior of Ultrasonic waves. 10
- b. Explain the Ultrasonic testing for Fatigue cracks and thickness measurement of pressure vessels. 10
- 6 a. Explain the different modes of display in Ultrasonic Testing. 10
- b. Define the following :
- i) Longitudinal waves      ii) Traverse waves      iii) Shear waves 10
- iv) Acoustic impedance      v) Immersion testing.

#### UNIT - IV

- 7 a. With neat sketch, explain the principle of Radiographic examination. 10
- b. Explain about Radiographic sensitivity. 10
- 8 a. Explain briefly about Image quality indications. 10
- b. Define the following :
- i) Intensifying screens      ii) Film screens      iii) Film Density 10
- iv) Neutron Radiography      v) Radiation Monitoring      v) Gamma Ray.

**UNIT - V**

- 9 a. Explain the types of Holograms. 10
- b. Explain basic principle of optical holography and its applications. 10
- 10 a. Explain briefly about principle and applications of Acoustical holography. 10
- b. A reflection hologram is made with red laser light. However when illuminated with white light, the image appears yellow or even green. Why? 10

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