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

(An Autonomous Institution affiliated to VTU, Belagavi)

**Seventh Semester, B.E. - Mechanical Engineering**

**Semester End Examination; Dec - 2017 / Jan - 2018**

### Non Destructive Testing

*Time: 3 hrs*

*Max. Marks: 100*

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

#### UNIT - I

- |   |    |   |    |
|---|----|---|----|
| 1 | a. | Bring out the comparison of Destructive testing with Non Destructive tests.   | 10 |
|   | b. | Explain with neat sketch working of Rigid bore scope.   | 10 |
| 2 | a. | Analyse the salient characteristics of liquid penetrate test giving its advantages, disadvantages and applications. | 10 |
|   | b. | Sketch and explain working of Flexible bore scope.  | 10 |

#### UNIT - II

- |   |    |   |    |
|---|----|---|----|
| 3 | a. | List the different methods of magnetization in MPI and explain any two of them with sketches. | 10 |
|   | b. | Sketch and explain X-ray tube radiography.  | 10 |
| 4 | a. | Explain with sketch the steps involved in magnetic particle inspection.                       | 10 |
|   | b. | With a neat sketch explain the principle of Real time radiography.                            | 10 |

#### UNIT - III

- |   |    |   |    |
|---|----|---|----|
| 5 | a. | Explain the various types of coils used in Eddy current inspection with sketches.                             | 14 |
|   | b. | What are the advantages and limitations of Eddy current testing?  | 6  |
| 6 | a. | Sketch and explain the principle of optical holography.   | 10 |
|   | b. | Explain briefly the influence of the following operating variables on the quality of Eddy current inspection: | 10 |
|   |    | (i) Impedance components  |    |
|   |    | (ii) Phasor representations of Sinusoids  |    |

#### UNIT - IV

- |   |    |  |    |
|---|----|--|----|
| 7 | a. | What are the major variables in ultrasonic inspection? Explain.                          | 10 |
|   | b. | Explain briefly the working principle of computed tomography technique.                  | 10 |
| 8 | a. | Briefly discuss the pulse echo technique of ultrasonic inspections and its applications. | 10 |
|   | b. | What are the advantages and applications of the computed tomography inspection?          | 10 |

Contd...2

**UNIT - V**

- 9 a. With a neat sketch explain the basic principle of acoustic emission testing system? Explain the potential capabilities of this technique. 10
- b. Write a short note on Digital image enhancement system technique. 10
- 10 a. Compare acoustic emission methods with other inspection methods. 8
- b. Distinguish between contact and non contact temperature sensor. 8
- c. List the advantages of acoustic emission inspection. 4

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