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**Seventh Semester B.E. Degree Examination, Dec.2018/Jan.2019**  
**Non-Destructive Testing**

Time: 3 hrs.

Max. Marks:100

**Note: Answer any FIVE full questions, selecting  
at least TWO questions from each part.**

**PART - A**

- 1 a. State the different NDE (Non Destructive Evaluation) methods for different areas and also explain briefly. (10 Marks)
- b. Explain with neat sketch construction and working of helium leak detection. (10 Marks)
- 2 a. What is magnetic particle inspection and explain the basic principle of magnetic particle inspection. (10 Marks)
- b. Explain how the following components are inspected by using MPI (Magnetic Particle inspection).
  - (i) Oil well tubing. (10 Marks)
  - (ii) Hollow cylinders. (10 Marks)
- 3 a. What is Eddy Current Inspection? State its advantages and limitation. (10 Marks)
- b. What is meant by lift off factor and fill factors with respect to eddy current inspection. (10 Marks)
- 4 a. Explain with neat sketches of microwave holography. (10 Marks)
- b. State the application, limitation and advantages of microwave inspection. (10 Marks)

**PART - B**

- 5 a. Explain characteristics of ultrasonic waves and its wave propagation. (10 Marks)
- b. What is ultrasonic inspection? State its advantages and disadvantages. (10 Marks)
- 6 a. Explain (i) Pulse-echo method. (ii) Transducer element. (10 Marks)
- b. Give the application with sketches of ultrasonic inspection of products like:
  - (i) Casting. (ii) Extrusion (iii) Rolled products (iv) Weldset (10 Marks)
- 7 a. With a neat sketch, explain X-ray tube used in radiographic inspection. (10 Marks)
- b. With sketches, explain application of radiography:
  - (i) Radiography
  - (ii) Weldments
  - (iii) Tubular structure
  - (iv) Complex shaper. (10 Marks)
- 8 a. What is optical holography state its advantage, limitation and application of optical holography interferometers. (10 Marks)
- b. Explain the interferometric technique of inspection by optical holography. (10 Marks)

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Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.