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10AU761

**Seventh Semester B.E. Degree Examination, Dec.2016/Jan.2017**

**Non-Destructive Testing**

Time: 3 hrs.

Max. Marks:100

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

**PART – A**

- 1 a. What is non-destructive testing? Explain the benefits of NDT. (04 Marks)  
b. Explain with neat sketch construction and working of Helium leak detector. (08 Marks)  
c. Explain with a block diagram, the water washable system of liquid penetrant inspection. (08 Marks)
- 2 a. Explain briefly about magnetic hysteresis. (04 Marks)  
b. Briefly explain the principle and procedure involved in magnetic particle inspection with figure. (08 Marks)  
c. With sketch explain how the following components are inspected using magnetic particle inspection:  
(i) Oil well tubing (ii) Crane hooks (08 Marks)
- 3 a. What is Eddy current inspection? State its advantages and limitations. (04 Marks)  
b. Explain briefly the influence of the following operating variables on the quality of Eddy current inspections:  
(i) Lift-off factor (ii) Coil impedance. (08 Marks)  
c. With a neat sketch, explain types of coil used in Eddy current inspection.  
(i) Probe and encircling coil. (ii) Internal or Bobbin type coil. (08 Marks)
- 4 a. Briefly explain the principle of operation of microwave inspection. (10 Marks)  
b. Write a short note on microwave Holography and its applications. (10 Marks)

**PART – B**

- 5 a. Explain the following with neat sketches:  
(i) 'A' – scan system (ii) 'C' – Scan system. (10 Marks)  
b. Explain briefly on operating variables of ultrasonic inspections. (10 Marks)
- 6 a. With reference to ultrasonic inspections, explain the following terms:  
(i) Transducer elements (ii) Search units. (10 Marks)  
b. With neat sketches explain ultrasonic inspection of products like,  
(i) Welds (ii) Castings (10 Marks)
- 7 a. With a neat sketch, explain X-ray tube used in radiographic inspection. (06 Marks)  
b. With sketches, explain application of radiography:  
(i) Inspection of flat plates. (ii) Inspection of weldments. (10 Marks)  
c. Write a short note on applications of thermal inspections. (04 Marks)
- 8 a. What is optical Holography? State its advantages, limitations and its applications. (06 Marks)  
b. Explain with neat sketch, optical holography for surface deformation. (08 Marks)  
c. What is Acoustic emission technique? State its advantages, limitations and applications. (06 Marks)

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2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.