

**B.E., DEGREE EXAMINATIONS: MAY/JUNE 2013**

Eighth Semester

**AERONAUTICAL ENGINEERING**

AER149 : Non Destructive Testing

**Time: Three Hours**

**Maximum Marks: 100**

**Answer all the Questions:-**

**PART A (10 x 1 = 10 Marks)**

1. Cracks which are caused by alternating stresses above a critical level are called:
  - a) Stress corrosion cracks
  - b) Cycling cracks
  - c) Critical cracks
  - d) Fatigue cracks
2. Which of the following is an isotope not artificially produced for industrial use:
  - a) Ir-192
  - b) Ra-226
  - c) Co-60
  - d) All of the above
3. 'Photoelectric effect' refers to:
  - a) An electric camera
  - b) Complete absorption of a photon
  - c) The visible electromagnetic spectrum
  - d) Scatter of neutrons
4. The most effective NDT method for locating surface cracks in ferromagnetic materials is:
  - a) Ultrasonic testing
  - b) Radiographic testing
  - c) Magnetic particles testing
  - d) liquid penetrant testing
5. The piezoelectric material in a search unit which vibrates to produce ultrasonic waves is called:
  - a) A backing material
  - b) A Lucite wedge
  - c) A transducer element or crystal
  - d) A couplant
6. When the motion of the particles of a medium is transverse to the direction of Propagation, the wave being transmitted is called
  - a) Longitudinal wave
  - b) Shear wave
  - c) Surface wave
  - d) Lamb wave
7. The most sensitive type of developer for the detection of fine discontinuities is:
  - a) Water soluble
  - b) Non-aqueous wet
  - c) Dry
  - d) Water suspendable
8. The temperature above which most soft steels become nonmagnetic is about:
  - a) 440°C (770°F)
  - b) 523°C (975°F)
  - c) 626°C (1160°F)
  - d) 754°C (1390°F)



23. a) (i) With neat sketch explain the working principle of ultrasonic testing and also mention its advantages. (8)

(ii) Write a short notes on (6)

1) Pulse-echo technique

2) Through Transmission technique

**(OR)**

b) (i) Briefly discuss about different types of scan used in ultrasonic testing. (10)

(ii) What are the factors affecting ultrasonic inspection? (4)

24. a) (i) With neat sketch explain the step by step process involved in Liquid Penetrant inspection and also mention its advantages. (10)

(ii) What are the basic characteristics of penetrant? (4)

**(OR)**

b) (i) With neat sketch explain the working principle of magnetic particle inspection used in NDT. (10)

(ii) What are the general properties of magnetic line of force? (4)

25. a) With neat sketch explain the working principle of thermography and also mention its advantage and disadvantages.

**(OR)**

b) With neat sketch explain the working principle of acoustic emission inspection and also mention its advantages and disadvantages.

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