KUMARAGURU college of technology
character is life

Register Number: ……..

B.E DEGREE EXAMINATIONS: APRIL/MAY 2016

(Regulation 2009)

Eighth Semester

AERONAUTICAL ENGINEERING

AER149: Nondestructive Testing

Time: Three Hours **Maximum Marks: 100**

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1. Generation of eddy currents depends on the principle of:
   a) Wave guide theory
   b) Electromagnetic induction.
   c) Magneto-restrictive forces
   d) All of the above
2. Surface waves are used to detect discontinuities in the test materials
   a) At half the depth
   b) Above the lower surface
   c) On the surface where the probe is in contact
   d) None of the above
3. X-rays have a wavelength range of
   a) 10^{-8} -10^{-12} m
   b) 10^{-12} -10^{-16}m
   c) 10^{-6} -10^{-10}m
   d) None of the above.
4. X rays are produced by
   a) Radioactive isotopes
   b) The rapid deceleration of electrons
   c) Ultraviolet radiation of unstable atoms
   d) All of the above
5. What part of the ultrasonic machine generates short, large-amplitude pulses of controlled energy?
   a) Pulser
   b) Amplifier
   c) Transducer
   d) Scanner
6. When a sound beam is reflected
   a) The angle of reflection is found using Snell's law
   b) The angle of reflection equals the angle of incidence
   c) All the sound energy is reflected unless the acoustic impedance is zero
   d) Beam spread is decreased
7. Which of the following are ferromagnetic materials?
   a) Aluminium, iron, copper
   b) Iron, copper, nickel

c) Copper, aluminium, silver d) Iron, cobalt, nickel

8. Identify the advantage of Eddy current testing

a) Sensitive to small cracks b) Immediate results

c) portable d) All of the above

9. What is an important wave mode in Acoustic Emission testing

a) longitudinal wave b) transversal wave

c) Lamb wave d) None of the above

10. Acoustic velocities are primarily determined by

a) Density b) Elasticity

c) Both a and b d) Acoustic impedance

PART B (10 x 2 = 20 Marks)

11. State any four reasons for choosing Non Destructive Testing.
12. List out some of the NDT methods for detection of surface weld defects or discontinuities.
13. Identify the demerits of radiography.
14. Define the term scattering.
15. Mention the various sources of sound.
16. Discover the various merits of ultrasonic inspection.
17. Identify the various Properties of Magnetic Lines of Force
18. List out the various applications of Eddy current testing.
19. Identify the characteristics of In-line Hologram.
20. List out the various applications of Acoustic Emission Testing.

PART C (5 x 14 = 70 Marks)

21. a) Discover the various engineering applications of Non Destructive Testing in detail.

(OR)

b) Define Composite material and with relevant sketches explain the various defects occur in composite materials.

22. a) (i) With neat relevant sketches explain the film radiography. (10)

(ii) Discuss about the various radiation sources available. (4)

(OR)

b) With neat sketch explain the crack detection in a material using gamma ray radiography

23. a) Illustrate in detail about the ultrasonic wave propagation with necessary sketches.

(OR)

b) Explain the various types of ultrasonic scanning systems with neat sketches.

24. a) With neat sketches, illustrate the principle and testing procedure of Magnetic Particle Inspection along with its merits and demerits.

(OR)

b) With neat sketches, illustrate the principle of Eddy current Testing with its merits and demerits.

25. a) With neat sketch explain the working principle of optical holography used in NDT.

(OR)

b) Define the term acoustics. With neat sketch explain the working principle of acoustic emission inspection used for NDT.

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