QP Code: 15IC-C11 Reg. No_____

DEPARTMENT OF PHYSICS AND NANOTECHNOLOGY
FACULTY OF ENGINEERING AND TECHNOLOGY
SRM UNIVERSITY, KATTANKULATHUR

CYCLE TEST - II

Subject code & Title : 15PY101 – PHYSICS **Date : 28.09.15**
Time : 100 Min **Max. Marks: 40**

PART – A (8 x 1 = 8 Marks)

1. The sound waves having frequency above 20, 000 Hz are called___
   a) Microwaves b) Radio waves c) Ultrasonic waves d) Infrasonic waves
2. _____ is an ultrasound based diagnostic medical imaging technique used to visualize muscles, tendons and many internal organs.
   a) Medical sonography b) ECG c) EEG d) Ultrasonic blood flow meter
3. The vector field whose curl is zero is called _____
   a) Rotational b) conservative c) solenoidal d) Irrotational
4. The characteristic impedance of free space is_____
   a) 3.768 Ohm b) 37. 68 Ohm c) 3768 Ohm d) 376.8 Ohm
5. The rate of energy flow per unit area in a plane electromagnetic wave is defined by _____vector
   a) Normal b) Poynting c) Ket d) Oblique
6. A hollow metallic tube of uniform cross section for transmitting electromagnetic waves by successive reflections is called_____
   a) Rotor b) Motor c) Turbine d) Waveguide
7. The electrons which participate in transferring the energy to the RF field are called _____ electrons.
   a) Favoured b) Unfavoured c) Normal d) Abnormal
8. _____ theorem relates the volume integral of the divergence of a vector to the surface integral of vector.
   a) Green's b) Gauss Divergence c) Stokes d) Poynting

PART – B (2 x4 = 8 Marks)
(Answer any two questions)

9. With neat sketch explain the principle and working of detection of flaws in metals by using Ultrasonic waves. Also mention its features. (4 marks)

10. From the wave equation of an electromagnetic wave deduce the expression for the characteristic impedance of a medium. (4 Marks)

11. With the help of functional block diagram of RADAR, explain the working principle of RADAR. Also discuss in detail of radar range equation. (3+1= 4 Marks)

PART – C (2 x12 = 24 Marks)
(Answer all the Questions)

12. a). With neat sketch, explain construction and working of piezo electric oscillator method for production of Ultrasonic waves. (8 marks)
    b) Explain the propagation of electromagnetic waves in rectangular waveguides. (4 marks)

13. a) Obtain the expression for 'any three Maxwell's equations of electromagnetism from fundamental laws of electricity and magnetism. (9 Marks)

    b). The dimensions of the rectangular waveguide are 2.5 cm x 1 cm. The frequency is 8.6 GHz, find possible modes for TE waves. (3 marks)

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