

30570

(Pages : 2)

Name.....

Reg. No.....

FIFTH SEMESTER B.Sc. DEGREE EXAMINATION, OCTOBER 2012

(CCSS)

Physics

AP 5 B 11—ELECTRODYNAMICS—II

Time : Three Hours

Maximum : 30 Weightage

Section I (Objective Type Questions)

Answer all questions.

Each  $\frac{1}{4}$  weightage.

1. The magnetic field  $\vec{B}$  is expressed in terms of the electric field as \_\_\_\_\_.
2. The expression for the Poynting vector is \_\_\_\_\_.
3. For linear media polarization is expressed as \_\_\_\_\_.
4. All currents being a function is taken as \_\_\_\_\_.
5. The superposition theorem is based on the concept of :  
(a) Duality. (b) Linearity.  
(c) Reciprocity. (d) Non-linearity.
6. Superposition theorem is applied to circuits having \_\_\_\_\_ elements.  
(a) Non-linear. (b) Passive.  
(c) Linear bilateral. (d) Resistive.
7. Norton's theorem reduces a complex circuit to a parallel circuit (true/false).
8. Electromagnetic waves carry energy (true/false).
9. Snell's law is associated with  
(a) Polarization. (b) Interference.  
(c) Reflection and refraction. (d) Diffraction.
10. A parallel resonant circuit is called \_\_\_\_\_.
11. State the unit of power in S.I. units.
12. What is the unit of capacitance ?

(12  $\times$   $\frac{1}{4}$  = 3 weightage)

Section II (Short Answer Type Questions)

Answer all questions.

Each 1 weightage.

1. Write down Maxwell's equation in matter.
2. Write down the boundary conditions for a linear medium.
3. What is meant by the intensity of electromagnetic wave ?
4. What is a transient current ?

Turn over

17. Sketch an LR circuit.
18. Explain  $\hat{j}$  evaporator.
19. State Thevenin's theorem.
20. Give the use of Anderson's bridge.
21. Sketch out a Rayleigh bridge.

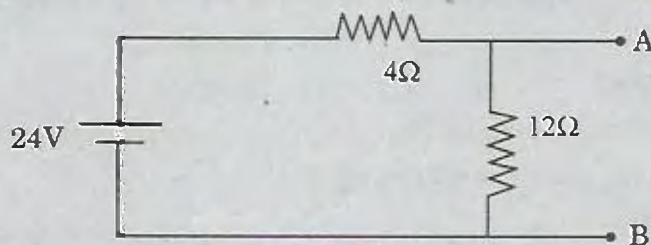
(9 × 1 = 9 w)

### Section III (Short Essay/Paragraph Questions)

Answer any five questions.

Each 2 weightage.

22. A magnetic potential  $V = (2xz\hat{z} + 4yj)$  is given. Find the energy density at  $(x, y) = (1, 1)$ .
23. Define the resonant frequency and Q factor of a transient circuit.
24. State and explain Kirchoff's law.
25. Show that  $\vec{E} = (y^2\hat{z} + x^2\hat{j})$  is an impossible electric field.
26. Given  $\vec{E} = E_0 C^{z(kx - \omega t)} \hat{j}$ . Obtain the real part of  $\vec{E}$  and the corresponding magnetic field.
27. State and explain power transfer theorem.
28. Nortonise the circuit shown :



(5 × 2 = 10 w)

### Section IV (Essay Questions)

Answer any two questions.

Each 4 weightage.

29. Discuss the reflection and transmission at normal incidence for electromagnetic waves.
30. Sketch out the series and parallel circuits (LCR) and compare them.
31. With neat diagram describe Anderson and Rayleigh bridges.

(2 × 4 = 8 w)