Reg. No. : | | | | | | | | | | |

Question Paper Code: 41443

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2016

Fourth Semester

Electronics and Communication Engineering

14UEC403 - ELECTROMAGNETIC FIELDS

(Regulation 2014)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. What is the gradient of scalar field?

   (a) Vector differential operator (b) Surface Integrals
   (c) Volume Integrals (d) None of the above

2. Discuss-Charged line

   (a) infinitesimal charge elements (b) Enlarged charge elements
   (c) Supreme Charged elements (d) None of the above

3. What is magnetic flux density?

   (a) Magnetic field (b) Magnetic Induction
   (c) Electric Intensity (d) None of these

4. Give the lorentz force equation

   (a) F=qE+qvxB (b) F=Eq+B
   (c) F=B+Qx (d) none of these

5. What is point form of Ohm's law

   (a) Two points directly proportional (b) Both on same directions
   (c) Both are different directions (d) none of these

6. Define electric density

(a) Electric field (b) Non Electric Field
(c) Magnetic Field (d) none of these

7. Discuss Faraday's law

(a) Non Magnetic Field (b) Electromagnetic Induction
(c) Electric Field (d) none of these

8. Give the equation of power flow in coaxial cable

(a) Poynting Vector (b) Scalar Vector
(c) Radial Vector (d) none of these

9. What is skin effect?

(a) High Frequency AC (b) Low frequency AC
(c) Very Low Frequency AC (d) none of these

10. Discuss on brewster angle

(a) Polarization angle (b) Reflection angle
(c) Refraction angle (d) none of these

PART - B (5 x 2 = 10 Marks)

11. List the principles of superposition.

12. Define Biot-Savart Law.

13. Define mutual inductance.

14. What is displacement current?

15. Give the properties of conductors.

PART - C (5 x 16 = 80 Marks)

16. (a) Discuss and obtain an expression for incremental length, surface area and volume integrals. And also state divergence theorem. (16)

Or

(b) (i) Prove Gauss' law and write its applications. (8)

(ii) Obtain about Electric field intensity (E) due to a line charge. (8)

17. (a) (i) How is torque on a loop carrying current. (8)

(ii) Derive an expression for magnetic field intensity due to an infinite long conductor. (8)

Or

(b) Prove Ampere's circuital law. Derive an expression for vector magnetic potential. (16)

18. (a) (i) Explain and derive the boundary conditions for a electric field with an example. (10)

(ii) Write short notes on solenoids. (6)

Or

(b) (i) Obtain an expression for capacitance of a parallel plate capacitor. (8)

(ii) Explain the following (a) magnetization (b) permeability. (8)

19. (a) Derive the Poynting vector from Maxwell's equations and explain power of flow. (16)

Or

(b) With necessary explanation, derive the Maxwell's equation in integral and differential form. (16)

20. (a) Derive wave equation in a conducting medium. (16)

Or

(b) Discuss reflection of plane wave from a conductor in normal incidence. (16)

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