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

Question Paper Code: 34403

B.E. / B.Tech. DEGREE EXAMINATION, DEC 2020

Fourth Semester

Electronics and Communication Engineering

01UEC403 – ELECTROMAGNETIC FIELDS

(Regulation 2013)

Duration: One hour Maximum: 30 Marks

PART A - (6 x 1 = 6 Marks)

(Answer any six of the following questions)

1. A field F is said to be SOLENOIDAL if

   (a) CURL F=0 (b) DIV F=0 (c) $\nabla^2 F = 0$ (d) $\int$ F.dl = 0

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. Unit of Poynting vector is

(a) VA/m (b) VA (c) VA/m^2 (d) Watt/m

9. What is skin effect?

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

10. Conductivity of perfect dielectric is

(a) unity (b) 0.5 (c) $\frac{1}{\sqrt{2}}$ (d) zero

PART – B (3 x 8= 24 Marks)

(Answer any three of the following questions)

11. Develop an expression for an electric field due to an infinite sheet of charge having uniform charge density ρ_s C/m^2,placed in *xy* plane cut a point *P* on *z*-axis at a distance of '*z*' *m* from the origin. (8)

12. Derive the expression for torque developed in a rectangular closed circuit carrying current I in a uniform field. (8)

13. Derive the boundary conditions of the normal and tangential components of magnetic field at the inter face of two media with different dielectrics. (8)

14. State Ampere's circuital law and prove the modified form of Ampere's circuital law as Maxwell's first equation in integral form. (8)

15. Derive the electromagnetic wave equations in frequency domain and obtain the expressions for intrinsic impedance and propagation constant for free space, conductor and dielectric medium. (8)