Printed Pages:02 **Sub Code:REC 402**

Paper Id: 238261 **Roll No.** | | | | | | | | | | |

B.TECH
(SEM IV) THEORY EXAMINATION 2022-23
ELECTROMAGNETIC FIELD THEORY

Time: 3 Hours ***Total Marks: 70***

Note: Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1. Attempt *all* questions in brief. 2 x 7 = 14

(a) Define like vector.
(b) Write the properties of scalar product.
(c) Define gauss law.
(d) Define electric potential.
(e) Write short note on dipole moment.
(f) What do you mean by magnetic flux and magnetic flux density
(g) Write note on stub matching

SECTION B

2. Attempt any *three* of the following: 7 x 3 = 21

(a) Prove that the electric flux density due to point charge has divergence zero
(b) Discuss the boundary condition for interface between a conductor and dielectric material
(c) A circular loop of conducting wire of radius 4 cm carries a current of 80 Amperes. determine the energy at the centre of the loop
(d) Write note on phase velocity and group velocity.
(e) Derive the equation of transmission line?

SECTION C

3. Attempt any *one* part of the following: 7 x 1 = 7

(a) Define and explain following.
  (i) divergence theorem
  (ii) Stoke theorem
(b) Convert the Cartesian coordinate system into cylindrical coordinate system?

4. Attempt any *one* part of the following: 7 x 1 = 7

(a) Discuss the following
  (i) poisson's equation
  (ii) Laplace'e equation
(b) State and explain Coulomb's law and its importance?

5. Attempt any *one* part of the following: 7 x 1 = 7

(a) State and explain Ampere circuital law? Discuss any one application of Ampere circuital law?
(b) State bio savart law. Discuss the mathematical generalization of experimental conclusions of bio and savart.

6. Attempt any *one* part of the following: 7 x 1 = 7

(a) Define and explain following
  (i) reflection coefficient
  (ii) transmission coefficient

(b) State and explain poynting theorem.

7. Attempt any *one* part of the following: 7 x 1 = 7

(a) Derive the expression for input impedance Zin of transmission line?

(b) Write a note on impedance matching.