No. of Printed Pages : 3   **BIEL-006**

B. TECH.-VIEP-ELECTRONICS AND COMMUNICATION ENGINEERING (BTECVI)

Term-End Examination

June, 2019

BIEL-006 : ELECTROMAGNETIC FIELD THEORY

Time : 3 Hours   *Maximum Marks : 70*

Note :   Attempt any seven questions. All questions carry equal marks. Symbol used have their usual meanings. Missing data, if any, may be assumed.

1. Write Maxwell's equations in time varying fields and their interpretation in detail.   10

2. Find an expression for the magnetic flux density 'B' at a distance 'h' above the centre of rectangular loop of wire 'b' meter on one side and 'a' meter on otherwise. The loop carries a current of 1 amp.   10

3. What is Poynting theorem ? Explain its significance. Deduce an expression for instantaneous, average and complex Poynting vector.   10

4. State divergence theorem with its significance. Derive the equation for divergence theorem. 10

5. State and explain the electrostatic boundary conditions existing at the boundary between two dielectrics.   10

6. Explain the inconsistency of Ampere's law in detail and make necessary Maxwell's modifications.   ·   10

7. A vector in cylindrical coordinates is given as :

$$\vec{A} = 2\cos\phi\hat{a}\,\rho + \rho\hat{a}Q$$

   verify Stokes' theorem for the surface bounded by +x axis, +y axis and the arc of circle of radius 1 unit with centre at the origin.   10

8. Find the reflection coefficient and transmission coefficient of an electric field wave travelling in air and incident normally on a boundary between air and dielectric having permeability of μ_0 and permittivity $\Sigma_r = 4$.   10

9. Write short notes on any *two* of the following :

2×5=10

(a) Standing wave ratio

(b) Attenuation in parallel plane guides

(c) Characterics of TE and TM waves