B.Tech. – VIEP – ELECTRICAL ENGINEERING (BTELVI)
Term-End Examination
December, 2017

00172

BIEE-009 : APPLIED ELECTROMAGNETICS

Time : 3 hours   *Maximum Marks : 70*

*Note : Attempt any **five** questions. All questions carry equal marks. Use of scientific calculator is permitted. Assume data, if any found missing.*

1. (a) What are the electromagnetic effects on transmission lines ? What are the most common types of transmission lines ?   7

    (b) Compare the advantages and disadvantages of coaxial cables and two-wire transmission lines.   7

2. Derive general expressions for Reflection coefficient and Transmission coefficient for E & H fields when an electromagnetic wave is incident normally on the boundary separating two different

    (a) conducting media, and

    (b) perfectly dielectric media.   7+7

3. (a) Explain all the four Maxwell's equations. 7

(b) Write the fundamental postulates relating to (i) electromagnetic induction, and (ii) displacement current. Explain their concepts. 7

4. (a) State and explain Ampere's law in integral and differential form as used in magnetic fields. 7

(b) Explain the concepts of

(i) Scalar magnetic potential, and

(ii) Magnetic vector potential. 7

5. Define the following terms : $4 \times 3\frac{1}{2} = 14$

(a) Dipole moment

(b) Electric susceptibility

(c) Relative dielectric constant

(d) Polarization

6. (a) Explain the method of electrical images and discuss its applications in the study of electromagnetic problems. 7

(b) State and explain the following : 7

(i) Divergence Theorem

(ii) Stokes' Theorem

7. (a) Define the term 'Potential' and establish the gradient relationship between potential and electric field intensity. 7

(b) State and explain Gauss's law in differential form. Also explain what is meant by $\nabla.D$. 7

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