

**B.Tech. – VIEP – ELECTRICAL ENGINEERING
(BTELVI)**

Term-End Examination

June, 2015

00606

BIEE-005 : ELECTROMAGNETIC THEORY

Time : 3 hours

Maximum Marks : 70

*Note : Answer any seven questions of the following.
Assume missing data, if any.*

1. What do you mean by electric field ? Obtain the expression for electric field due to a charge 'Q'. 10
2. If Coulomb's force $F = 2\hat{a}_x + \hat{a}_y + \hat{a}_z$ N, is acting on a charge of 10 C, find the electric field intensity, its magnitude and direction. 10
3. Derive the expression for the capacitance between two parallel wires system. 10
4. The region $y < 0$ contains a dielectric material for which $\epsilon_{r_1} = 2.0$ and the region $y > 0$ contains a dielectric material for which $\epsilon_{r_2} = 4.0$. If the electric field passes from two regions and the value of electric field at region $y < 0$ is

$$\vec{E}_1 = -3.0\hat{a}_x + 5.0\hat{a}_y + 7.0\hat{a}_z,$$

find the electric field in $y > 0$ region (\vec{E}_2). 10

5. Explain the Ampere's circuital law. Also derive the differential form of Ampere's law. 10
 6. State the Maxwell's equations. Also explain their practical meaning. 10
 7. Derive the wave equation for conducting medium. Also discuss about the factors responsible for losses. 10
 8. Explain the flow of power with an electromagnetic wave. Also discuss Poynting's vector. 10
 9. Derive an expression for Input impedance of a transmission line. 10
 10. Write short notes on any *two* of the following : $2 \times 5 = 10$
 - (a) Stokes' Theorem.
 - (b) Standing Waves
 - (c) Vector Magnetic Potential
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