

**B.Tech. - VIEP - ELECTRONICS AND
COMMUNICATION ENGINEERING
(BTECVI)**

00473

Term-End Examination**December, 2018****BIEL-006 : ELECTROMAGNETIC FIELD THEORY***Time : 3 hours**Maximum Marks : 70*

*Note : Attempt any **seven** questions. All questions carry equal marks. Symbols used have their usual meanings. Use of scientific calculator is allowed. Missing data, if any, may be assumed.*

1. (a) State Ampere's Circuital Law. 5
(b) Given the two vectors,
$$\vec{A} = 2\vec{a}_x - 5\vec{a}_y \text{ and } \vec{B} = 3\vec{a}_x + 5\vec{a}_y + 2\vec{a}_z,$$
find the dot product and the angle between the two vectors. 5
2. Define electric field intensity. Obtain an expression for the electric field intensity at a point which is at a distance 'R' from a point charge Q. 10

3. Find out the magnetic vector potential in the vicinity of a very long straight wire carrying current I . 10
4. If the magnetic field $\vec{H} = [3x \cos \beta + 6y \sin \alpha] \vec{a}_z$, find current density \vec{J} , if fields are invariant with time using point form of Maxwell's second equation. 10
5. Explain propagation of uniform plane wave in perfect dielectric. What is lossless dielectric? 10
6. State Poynting's theorem and explain its significance. 10
7. What is transverse magnetic wave? Explain its characteristics. How is it different from transverse electric wave? 10
8. A certain transmission line, has the following constants :
- $L = 9 \mu\text{H/m}, C = 16 \text{ pF/m}$
- The line is terminated in a resistive load of 1000Ω . Find the reflection coefficient and standing wave ratio. 10

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

2×5=10

- (a) Magnetic dipole
 - (b) Reflections in transmission line
 - (c) Wave impedance
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