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Total No. of Pages : 02

Total No. of Questions : 18

B.Tech. (EE) (PT) (Sem.-2)
ELECTROMAGNETIC FIELDS
Subject Code : BTEE-403
M.Code : 71538

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. **SECTION-A** is **COMPULSORY** consisting of **TEN** questions carrying **TWO** marks each.
2. **SECTION - B & C.** have **FOUR** questions each.
3. Attempt any **FIVE** questions from **SECTION B & C** carrying **EIGHT** marks each.
4. Select atleast **TWO** questions from **SECTION - B & C.**

SECTION-A

Write briefly :

1. Compute the divergence of the vector $xi + yj + zk$.
2. What is a Laplacian operator?
3. Determine the charge that produces an electric field strength of 40 V/cm at a distance of 30 cm in vacuum.
4. Write Laplace's equation in cylindrical coordinates.
5. What is the condition for the field to be realizable as static magnetic field?
6. Calculate the frequency at which the conduction and displacement currents become equal with unity conductivity in a material of permittivity 2.
7. Define the Equation of Continuity for time varying fields.
8. What do you understand by wave polarization?
9. What will happen when the wave is incident obliquely over dielectric -dielectric boundary?
10. Define Uniform Plane Wave Propagation.

SECTION-B

11. What is Gauss law? How Gauss law is applicable to point charge and infinite line charge.
12. What are the boundary conditions for static electric fields in the general form at the interface between two different dielectric media? Explain.
13. Define Biot Savart law. Calculate the magnetic field of line current along a thin straight wire of infinite length.
14. Differentiate between phase velocity and group velocity. Explain using suitable example.

SECTION-C

15. State and prove Poynting Theorem.
16. State and explain the Maxwell's equation for time varying fields both in differential and integral form.
17. Discuss the wave propagation in a conducting medium. Derive Helmholtz equation.
18. Obtain an expression for the propagation constant in good conductors. Explain skin effect.

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.