ELECTROMAGNETIC FIELDS

TWO MARK QUESTIONS

Soft Copy Prepared and Solved By

R. Senthilkumar

Lecturer, Dept. of Electronics & Communication Engineering

Institute of Road and Transport Techology, Erode, Tamilnadu-638 316

UNIT-I STATIC ELECTRIC FIELDS

1. **Define Stoke's theorem.**
2. **Write the relation between potential and electric field.**
3. **Define electric field intensity.**
4. **State divergence theorem.**
5. **Define volume charge density.**
6. **Define Lamellar field.**
7. **State Coulomb's law.**
8. **How Gauss Law is applied, when there is no symmetry?**
9. **Write Stoke's theorem and Divergence theorem. Mention the uses.**
10. **Distinguish conservative field from non-conservative field and give examples for both.**
11. **State the nature of conservative field.**
12. **Write mathematical expression for divergence theorem.**

Created by Neevia Personal Converter trial version http://www.neevia.com

13. **Determine the potential difference between the points 'a' and 'b' which are at a distance of 0.5m and 0.1m respectively from a negative charge of $20X10^{-30}$ coulomb,**

$\varepsilon_0 = 8.854 \text{pF/m}.$

14. **Explain the terms irrotational and solenoidal as applied to vector $\overline{F}$.**

15. **Distinguish potential and potential difference.**

16. **What is the use of Gauss's law?**

17. **Find the Gradient of scalar system $t = x^2 y + e^z$ at point P(1, 5, - 2).**

Created by Neevia Personal Converter trial version http://www.neevia.com

UNIT- II STATIC MAGNETIC FIELD

1. **State Ampere's circuital law.**
2. **Mention the importance of Lorentz force equation.**
3. **What do you mean by magnetic moment?**
4. **Brief about Biot-Savart law.**
5. **Write Lorentz force equation.**
6. **Write Lorentz force equation and its applications.**
7. **Differentiate scalar and vector magnetic potentials.**
8. **Define Biot-savart law.**
9. **Give integral expression for the force on a closed circuit that carries a current I in a magnetic field H.**
10. **A ferrite material has $\mu_R = 50$, operate with sufficiently low flux densities and B=0.05 T find H.**
11. **Define the terms magnetic moment and magnetic permeability.**
12. **Explain Gauss law for magnetic fields.**
13. **A long conductor with current 5A is in coincident with positive 'z' direction. If $\vec{B} = 4i + 4j$. Find the Force per unit length.**
14. **A steady current of 'I' flows in a conductor bent in the form of a square loop of side 'a' meters. Find the magnetic field intensity at the centre of the loop.**

Created by Neevia Personal Converter trial version http://www.neevia.com

UNIT- III ELECTRIC AND MAGNETIC FIELDS IN MATERIALS

2 Marks

1. **Write down Poisson's and Laplace's equations.**
2. **What are the boundary conditions between two dielectric media?**
3. **Brief about boundary conditions for electric fields.**
4. **What is meant by dielectric breakdown.**
5. **What is a homogeneous material?**
6. **Give the value of relative permeability of water upto 6 decimal points.**
7. **How do you find the vector potentials, knowing the current distribution?**
8. **Define dielectric strength. What is the dielectric strength of air at atmospheric pressure?**
9. **Write the Laplace equation in cylindrical coordinate system and mention atleast two applications.**
10. **What is a super paramagnetic material? Where it is used?**
11. **What is the significance of energy density? It depends on what factors?**
12. **Write boundary conditions on a perfect conductor surface.**
13. **What is displacement current? Compare displacement current with current due to flow of charges.**
14. **What is polarization?**
15. **Write Laplace equation and its applications.**
16. **Explain the phenomenon of hysterisis with reference to ferro magnetic material.**
17. **State boundary conditions for two different di-electric medium.**
18. **Write Poisson's equation in vector notation.**

Created by Neevia Personal Converter trial version http://www.neevia.com

19. Differentiate self inductance and mutual inductance.

20. Sketch a toroid and label its parts.

21. Determine the value of capacitance between 2 square plates cross sectional area 1 sq.cm separated by 1 cm placed in a liquid whose die-electric constant is 6 and relative permittivity of free space is 8.854 pF/m.

22. Write the equation in point form for ohms law.

23. Why is the electrostatic potential continuous at a boundary?

24. What is a magnetic dipole?

25. What is the significance of displacement current density?

26. Name the magnetic materials.

27. Derive capacitance of a parallel plate capacitor.

Created by Neevia Personal Converter trial version http://www.neevia.com

UNIT IV TIME VARYING ELECTRIC AND MAGNETIC FIELDS

1. **Brief about the Ampere's circuital law in integral form.**
2. **Brief about complex Poynting vector.**
3. **Write down Maxwell's equations derived from Faraday's laws.**
4. **Define Poynting vector.**
5. **Write down the Maxwell's equation in integral form.**
6. **Brief about complex Poynting vector.**
7. **What is the equation for total emf due to motion and transformer action? Give one practical case.**
8. **For a given toroid, how do you use Poynting vector?**
9. **Mention the significance of displacement current density.**
10. **Discuss the condition under which conduction current is equal to displacement current.**
11. **State's Faraday's law of electromagnetic induction with a mathematical expression.**
12. **Write the Maxwell's equation in point form.**
13. **Determine the EMF developed about the path r =0.5, z =0 and t = 0.**

    If B = 0.01sin377t

Created by Neevia Personal Converter trial version http://www.neevia.com

UNIT V ELECTROMAGNETIC WAVES

1. **What is meant by skin effect?**
2. **What is meant by circular polarization?**
3. **What is a wave?**
4. **Define skin effect.**
5. **Brief about the intrinsic impedance for a perfect dielectric medium.**
6. **What is meant by linear polarization?**
7. **What is the significance of intrinsic impedance of free space? What is its value?**
8. **State Brewster angle.**

Created by Neevia Personal Converter trial version http://www.neevia.com