DOON UNIVERSITY, DEHRADUN
End Semester Examination 2023, II Semester
Department of Physics, School of Physical Sciences
Course: PHG:151 Introduction to Electromagnetic Theory

Time Allowed: 2 Hours   *Maximum Marks: 50*

SECTION: A Attempt All Questions   *(Marks:1.5 X10=15)*

1. Write down Ampere's law.
2. Explain Gauss law for electrostatic field.
3. What is magnetic field define B?
4. What is Lorentz force?
5. What is Magnetic flux?
6. Explain Faraday's Law?
7. Define transformer and motional emf.
8. Whether Magnetic field is conservative or not?
9. If the air between capacitor plate is replaced by a medium of dielectric constant K. What will be the value of electric field between plates?
10. Write down expression for speed of light in terms of ε_0 and μ_0.

SECTION: B   Attempt any 3 Questions   *(Marks:5X3=15)*

11. What is vector potential? Stablish relation between electric field, vector potential & scalar potential.

12. What is Maxwell's displacement current? Discuss its physical significance.

13. What are polar and non polar molecule. Find out capacitance for parallel plate capacitor.

14. An electron is placed at each of the eight corners of a cube of side a, and another particle (charge +2e) at the center of the cube. Compute the potential energy of the system.

SECTION: C Attempt any 2 Questions   *(Marks:10 X2=20)*

15. State maxwell's equation for a system of charges and currents also obtain the wave equation for E and B in free space.

16. Obtain pointing theorem for the conservation of energy in an electromagnetic field and discuss the physical meaning of each term in the resulting equation.

17. What do you mean by Electrostatic field and Magnetostatic field? Find out Divergence and curl of magnetic field.