

ANURAG Engineering College**(An Autonomous Institution)****II B.Tech I Semester Supplementary Examinations, Jan/Feb-2024****ELECTROMAGNETIC FIELDS****(ELECTRICAL AND ELECTRONICS ENGINEERING)****Time: 3 Hours****Max. Marks: 75****Section – A (Short Answer type questions)****(25 Marks)****Answer All Questions**

	Course Outcome	B.T Level	Marks
1. What is electric potential? Mention the properties of potential function	CO1	L2	2M
2. Determine the force between two charges 3×10^{-4} C at P(1,2,3) and 10^{-4} C at Q(2,0,5) in vacuum	CO1	L2	3M
3. What is Electric dipole and Dipole moment?	CO2	L2	2M
4. Derive the equation of a Capacitance of parallel plate capacitor?	CO2	L2	3M
5. Derive the expression for the Relation between magnetic flux, magnetic flux density	CO3	L2	2M
6. Explain Oersted's experiment	CO3	L2	3M
7. Describe Scalar Magnetic potential and its limitations	CO4	L2	2M
8. Explain the significance of Lorentz force equation	CO4	L2	3M
9. Define self and Mutual inductance?	CO5	L1	2M
10. What is Poynting vector and what is its significance?	CO5	L2	3M

Section B (Essay Questions)**Answer all questions, each question carries equal marks.****(5 X 10M = 50M)**

11. A) Derive the expression for EFI due to an infinite line charge?	CO1	L3	10M
OR			
B) State and explain Gauss law? Describe the Applications of Gauss law?	CO1	L2	10M
12. A) Derive the expression for boundary conditions between Dielectric - Dielectric?	CO2	L3	10M
OR			
B) Define Continuity equation and derive the expression for Equation of continuity?	CO2	L3	10M
13. A) Using Biot-savart's law, obtain the expression for the magnetic flux density 'B' due to steady surface current in free space.	CO3	L3	10M
OR			
B) Derive the expression for Point form of Ampere's circuital law	CO3	L2	10M
14. A) Two infinitely long parallel conductors are separated by a distance 'd'. Find the force per unit length exerted by one of the Conductor on the other if the currents in the two conductors are I1 and I2.	CO4	L3	10M
OR			
B) Derive the expression for the Torque acting on a current loop placed in magnetic field.	CO4	L3	10M

15. A) State and derive Maxwell's equation for time varying electromagnetic fields CO5 L3 10M

OR

B) State and explain 'Poynting theorem' in case of time varying fields. CO5 L3 10M