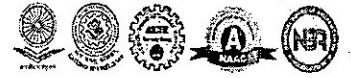**ACE**
Engineering College
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Question Paper Code: | EE305PC | ACE-R20

Semester End Examination
II B. Tech- I Semester- MARCH-2022
ELECTROMAGNTIC FIELDS
(Electrical and Electronics Engineering)

Time: 3 Hours

Max. Marks: 70

H. T. No										

Answer any 5 Questions out of 8 Questions from the following

Q.No	Question	Marks
1. a)	Derive Electric Field Intensity due to an Infinite line charge.	10
b)	Find Electric Field Intensity at (0,0,5)m due to a dipole $2\mu Cm$ at the origin.	4
2. a)	Derive boundary conditions for the boundary between Dielectric-Dielectric.	8
b)	A parallel plate capacitor has a plate area of 1.5 m^2 and a plate separation of 5mm. There are two dielectrics in between the plates. The first dielectric has a thickness of 3mm with a relative permittivity of 6 and second has a thickness of 2mm with a relative permittivity of 4. Find the capacitance of the capacitor.	6
3. a)	Derive Magnetic field intensity due to a straight current carrying conductor by using Biot-savarts law.	7
b)	Two conductors each of 1 cm diameter and spaced 1 m apart. The conductors carry a current of 100 A in opposite direction. Find the magnetic field intensity at the surface of each conductor and also at a point midway between conductors.	7
4. a)	Find the magnetic field intensity due to an infinite current sheet by using Ampere Circuital law.	7
b)	Explain self and mutual inductances in a magnetic circuit.	7
5. a)	Find the Potential and Electric Field Intensity due to Dipole.	8
b)	Write all point form and integral form of Maxwells equations.	6
6. a)	Derive displacement current density.	8
b)	Find the displacement current density within a parallel plate capacitor where $\in= 100 \in_0$, plate area is 0.01 m^2, distance between plates is 0.05 mm and voltage across capacitor is $100 Sin200\pi t$ Volts.	6

7. a)	What is Uniform Plane Wave? Derive the uniform plane wave equations for free space.	7
b)	In a medium characterized by $\sigma = 0$, $\mu = \mu_0$ and $\varepsilon = \varepsilon_0$ and $E = 20 \sin(10^8 t - \beta z)\, \hat{a}_y$ v/m. Calculate B and H.	7
8. a)	What is Faradays laws of Electromagnetic induction? And Explain about types of induced EMFs.	7
b)	Derive pointing theorem.	7