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Roll No

EE-6001-CBGS

B.E. VI Semester

Examination, December 2020

Choice Based Grading System (CBGS)

Electronic Magnetic Field Theory

Time : Three Hours

Maximum Marks : 70

Note: i) Attempt any five questions.

ii) All questions carry equal marks.

1. a) Describe cylindrical coordinate system and also deduce its conversion into spherical coordinate system.
b) State and explain Divergence theorem and Stoke's theorem. Give the relevance of these theorems to electromagnetic problems.
2. a) Define capacitor and capacitance and determine the capacitance of parallel plate capacitor.
b) A parallel plate capacitor with a large plate area is situated in air. With a potential difference of 100V between the plates, the stored energy 44.21 μ joule per unit area. Find the distance of separation between the plates? Assume area of plate is 1mm.
3. a) State and prove Biot-Savart's law?
b) Derive an expression for magnetic field intensity due to a finite length of current carrying filament.
4. a) Write and explain Ampere's circuital law with its applications. Write down point form of Ampere's circuital law.

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- b) Derive the formula for force between two long and parallel current carrying conductors.
- 5. a) Explain vector magnetic potential and its properties.
b) Using the Ampere's circuital law, to find the H and B inside a long straight nonmagnetic conductor for radius 8mm carrying a uniform current density of 100KA/m². Show that $\nabla \times H = J$.
- 6. a) Explain magnetic field intensity due to straight current carrying filament.
b) Describe Maxwell's equation in differential and integral form.
- 7. a) Determine the inductance of solenoid, toroid and coaxial cable with equations.
b) What are matched transmission lines? Differentiate between finite transmission line and infinite transmission line
- 8. a) Explain pointing vector theorem.
b) Explain sinusoidal time varying uniform plane wave in free space.
