Reg. No. : | | | | | | | | | | | |

T 3247

B.E./B.Tech. DEGREE EXAMINATION, APRIL/MAY 2008.

Third Semester

(Regulation 2004)

Electrical and Electronics Engineering

EE 1201 — ELECTROMAGNETIC THEORY

(Common to B.E (Part-Time) Second Semester – Regulation 2005)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — ($10 \times 2 = 20$ marks)

1. Give practical examples for diverging and curling fields. (2 in each).

2. Mention any two sources of electro magnetic fields.

3. Draw the equipotential lines and electric field lines for a parallel plate capacitor.

4. What is the practical significance of dielectric strength?

5. Draw the magnetic field pattern in and around a solenoid.

6. What is H due to a long straight current carrying conductor?

7. What is motional emf?

8. Mention the limitation of circuit theory.

9. What is the velocity of electromagnetic wave in free space and in lossless dielectric?

10. Define Poynting vector.

PART B — (5 × 16 = 80 marks)

11. (a) Define Divergence theorem and prove the same.

Or

(b) Derive the Stroke's theorem and give any one application of the theorem in electromagnetic fields.

12. (a) Discuss Electric field in free space, dielectric and in conductors.

Or

(b) Derive the electrostatic boundary conditions at the interface of two dielectric media. If one of the medium is conductor, discuss the field pattern.

13. (a) Derive H due to a circular current loop and extend the same to compute H due to a long solenoid.

Or

(b) Explain in detail the principle of operation of a motor.

14. (a) Differentiate conduction and displacement current and derive the same. Explain the need of displacement current in Maxwell's equations.

Or

(b) Define and derive skin depth.Calculate the skin depth for a medium with conductivity 100mho/m, relative permeability 2, relative permittivity 3, at 50Hz, 1MHz and 1GHz.

15. (a) In free space E(z, t) = 100 cos (wt-bz) axV/m. Calculate **H** and plot **E** and **H** waveforms at time t = 0.

Or

(b) Derive the transmission and reflection coefficients for the electromagnetic waves. Discuss the above for an open line and a short circuited line.