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

Question Paper Code: 33303

B.E. / B.Tech. DEGREE EXAMINATION, DEC 2020

Third Semester

Electrical and Electronics Engineering

01UEE303 - FIELD THEORY

(Regulation 2013)

Duration: 1.15 hrs Maximum: 30 Marks

PART A - (6 x 1 = 6 Marks)

(Answer any six of the following questions)

1. Vector algebra includes

   (a) Addition (b) Subtraction (c) Multiplication (d) All the above

2. Cross product of two vectors, $\bar{A} \times \bar{B} =$

   (a) $|A|\ |B| \sin\theta\ \overline{a_n}$ (b) $|A|\ |B| \cos\theta\ \overline{a_n}$
   (c) $|A|\ |B| \tan\theta\ \overline{a_n}$ (d) $|A|\ |B| \sec\theta\ \overline{a_n}$

3. The space surrounding an electric charge, over which the electric force of attraction (or) repulsion exists, is called its

   (a) Coulombs Law (b) Charge (c) Electric Field (d) Gauss Law

4. ε_0 is

   (a) $8.854*10^{-12}$ F/M (b) $6.854*10^{-12}$ F/M
   (c) $6.854*10^{-12}$ H/M (d) $8.854*10^{-12}$ F/M

5. Which of the following is the unit of magnetic flux density

   (a) Weber (b) Lumens
   (c) Tesla (d) None of these

6. The relationship between Magnetic flux density and Magnetic field Intensity is given by

   (a) $\mathcal{E}$ (b) μ (c) α (d) β

7. Substance which have the permeability less than the permeability of free space are known as

(a) ferromagnetic (b) paramagnetic
(c) diamagnetic (d) bipolar

8. Reluctance of magnetic circuit

(a) $\frac{A}{l\mu}$ (b) $\frac{l}{A\mu}$ (c) $\frac{l}{\mu}$ (d) $\frac{A}{\mu}$

9. Velocity of propagation of electro-magnetic wave through free space

(a) $V = \frac{1}{\sqrt{\mu_0 \varepsilon_0}}$ *m/sec* (b) $V = \sqrt{\mu_0 \varepsilon_0}$ *m/sec*
(c)) $V = \frac{1}{\sqrt{\mu_0 \varepsilon_0}}$ m^2/sec (d) $V = \sqrt{\mu_0 \varepsilon_0}\, m^2$/sec

10. A point form of faraday's law is

(a) $\nabla . \bar{D} = -\rho_v$ (b) $\nabla . \bar{D} = \rho_l$
(c) $\nabla \times \bar{E} = -\frac{\partial \bar{B}}{\partial t}$ (d) $\nabla \times \bar{E} = \frac{\partial \bar{B}}{\partial t}$

PART – B (3 x 8= 24 Marks)

(Answer any three of the following questions)

11. State and prove Divergence theorem. (8)

12. State and prove Gauss's law. (8)

13. Using Bio-Savart law find H due to finite and infinitely long straight conductor. (8)

14. Derive the expressions for displacement current and conduction current densities. (8)

15. State the Poynting vector and establish its usage in Electromagnetic wave analysis. (8)