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Question Paper Code: 53303

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

Third Semester

Electrical and Electronics Engineering

15UEE303 - FIELD THEORY

(Regulation 2015)

Duration: One hour

Maximum: 30 Marks

PART A - (6 x 1 = 6 Marks)

(Answer any six of the following questions)

1. The maximum space rate of change of that function is CO1 -R
(a) Gradient (b) Curl (c) Divergence (d) del operator
2. Under what condition the vectors are said to be in parallel CO1 -R
(a) $A \cdot B = 0$ (b) $A \times B = 0$ (c) $\Delta \cdot A = 0$ (d) $\Delta \times A = 0$
3. Poisson's equation is CO2-R
(a) $\Delta^2 V = -\rho/\epsilon$ (b) $\Delta^2 V = 0$ (c) $\Delta V = -\rho/\epsilon$ (d) $\Delta V = 0$
4. Relation between electric field intensity and electric flux density $D =$ CO2- R
(a) ϵ/σ (b) ϵ/E (c) $E \epsilon$ (d) σ/ϵ
5. Hysteresis loop gives the relation of CO3- R
(a) B lags H (b) B leads H (c) B independent (d) none of the above
6. Inductance of a toroid is directly proportional to CO3- R
(a) No. of turns (b) square of the area (c) area (d) volume
7. Maxwells equation IV is derived from CO4- R
(a) Faradays law (b) Amperes circuit law
(c) Gauss law of electric field (d) Gauss law of magnetic field
8. Circuit theory satisfies CO4- R
(a) Three dimensional analysis (b) simple to understand
(c) reference frequency (d) voltage is not directly involved

9. For a uniform plane wave E and H is at CO5- R
- (a) Parallel to each other (b) different frequency
(c) Perpendicular to each other (d) different phase
10. The characteristic impedance of free space is given by CO5- R
- (a) Ratio of E and H (b) permeability / permittivity
(c) square root of Ratio of E and H (d) permittivity / permeability

PART – B (3 x 8= 24 Marks)

(Answer any three of the following questions)

11. Verify the divergence theorem for the following vector $A=xy^2 ax+y^3 ay+y^2z az$ and the surface is a cuboid defined by $0<x<1, 0<y<1, 0<z<1$. CO1 -App (8)
12. Obtain the dipole moment of electric dipole. CO2- U (8)
13. Determine the magnetic field at point P due to the current carrying conductor. CO3- U (8)
14. With necessary explanation, derive the Maxwell's equation in differential and integral forms. CO4 -U (8)
15. State and explain Poynting's theorem CO5- U (8)