Total No. of Questions: 8]

## P313

[6003]-393

SEAT No. :

[Total No. of Pages : 2

T.E. (E&TC Engineering) ELECTROMAGNETIC FIELD THEORY (2019 Pattern) (Semester-I) (304182)

*Time : 2½ Hours]* 

Instructions to the candidates:

- [Max. Marks : 70
- 1) Answer Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8.
- 2) Figures to the right indicate full marks.
- 3) Assume suitable data, if necessary.
- 4) Use of a Calculator is allowed.
- 5) Neat diagrams must be drawn wherever necessary.
- Q1) a)Derive the Poisson's and Laplace's equation from Gauss's Law. State<br/>Laplace's equation in three co-ordinate system[10]
  - b) Derive an boundary expression for dielectric-dielectric medium [8]
- *Q2*) a) For a parallel plate capacitor, area of plate  $A=12cm^2$ , spacing between plate d = 5mm separated by dielectric of  $\epsilon_r = 12$ , connected to 40 V battery find: [8]

OR

- i) Capacitance
- ii) E
- iii) D
- iv) Energy stored in capacitor
- b) Derive an boundary expression for an interface between two magnetic medium with permeability  $\mu_1$  and  $\mu_2$  [10]

Q3) a) State and Explain Displacement Current Density and Displacement Current. Explain Physical Significance of displacement current [8]
b) Write a Short note on Faradays' Law and Lenz's law [8]

## OR

*Q4*) a) State and Prove Poynting Theorem [
b) Write Maxwell equation for free space in point form and integral form

[8]

[8]

Explain Snell's law of refraction. Derive the same. [10] **Q5**) a) Explain reflection of Uniform Plane wave [8] b) ÔR Define depth of penetration, Derive the expression for depth of penetra-**Q6**) a) tion for good conductor. [8] Define b) [10] i) Phase velocit Group Velocity ii) **Propogation Constant** iii) Intrinsic impendence iv) Wavelength v) Explain different distortions of transmission lines? What is mean by **Q7**) a) distortion less line and explain the condition of distortion less lines? [8] b) A lossy dielectric is characterized by  $\leq 2.5 \ \mu_r = 4 \text{ and } 6 = 10^3 \text{ per}$ ohm.m at frequency 10 MHz find [10] attenuatin Constant i) ii) Phase constant Velocity of Propagation iii) Wavelength and iv) Intrinsic impendence v) OR Derive relation between Primary constant and secondary constant of **Q8**) a) transmission line [8] A 50 ohm transmission line is terminated in a load  $Z_{h}$ b)  $= 25 + i50 \Omega$ . The .olh Ctick of 600 length of transmission line is 3.3 lambada Find the following using smith chart **[10]** VSWR i) **Reflection coefficient** ii) Input impedance iii) iv) input admittance.