

B.TECH. SEM -V ELECTRONICS ENGG.) 2014 COURSE
(CBCS) : SUMMER - 2018
SUBJECT : ELECTROMAGNETIC ENGINEERING

Day : **Friday** Time : **10.00 AM TO 01.00 PM**
Date : **25/05/2018** **S-2018-2356** Max. Marks : 60

N. B. :

- 1) All questions are **COMPULSORY**.
- 2) Figures to the right indicate **FULL** marks.
- 3) Use of non-programmable **CALCULATOR** is allowed.
- 4) Assume suitable data if necessary.

- Q. 1** a) Explain co-ordinate Transformations. (05)
b) Explain curl and divergence concept. (05)

OR

- a) Define coulomb's law (force between point charges). (05)
b) Give Cartesian co-ordinates of point P ($r = 2, \theta = 80^\circ, \phi = 30^\circ$) (05)

- Q. 2** Find electric flux density at (6, 4, - 5) due to (10)
i) Line charge $\rho_L = 30 \mu C$ on the z-axis
ii) A Sheet charge $\rho_s = 45 \mu C$ at a plane $x = 9$

OR

- A potential is given by $V = 2(x + 1)^2 (y + 2)^2 (z + 3)^2$ V in free space (10)
Calculate :
i) Potential ii) E iii) D iv) V at a point A(1, 2, 3)

- Q. 3** A current filament of 3 A in a_y direction at $x = 3, z = -2$. Find H at point (10)
(3, 4, 6).

OR

- Derive the boundary conditions between two different magnetic materials. (10)

- Q. 4** A 9.4 GHz uniform plane wave is propagating in polyethylene ($\epsilon_r = 2.26$) (10)
If the amplitude of electric field intensity is 600 V/m and material is assumed to be loss less. Find
i) Phase constant ii) Wavelength in polyethylene
iii) Velocity of propagation iv) Intrinsic impedance
v) Amplitude of magnetic field intensity

OR

- Derive the expression for Poynting Theorem. (10)

- Q. 5** Derive transmission line equations and constants. (10)

OR

- Describe formation of Smith chart (constant x-circles and constant r- circles) (10)

- Q. 6** Describe Antenna specifications. (10)

OR

- Derive TE and TM modes in rectangular waveguide. (10)

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