T.E. / ELX / Sem-VI / GBCGs / R-19 / 'C' Scheme / Sub:- EE / S.H.-2024
Date:- 05/12/2024
GP. Code:- 10068233

(3Hours.) **Max. Marks: 80**

N.B.: (1) Question No. **1** is **Compulsory**.
(2) Attempt any **three** questions out of the remaining **five**.
(3) Each question carries 20 marks and sub-question carry equal marks.
(4) Assume suitable data if required.

Question No. 1 is Compulsory. [Any Four]

1.	**(a)**	State and prove Divergence theorem.	**(5)**
	(b)	Explain the significance of convection and conduction current.	**(5)**
	(c)	Derive Poisson's and Laplace equation	**(5)**
	(d)	Explain the boundary conditions of **E** and **H** fields for two dielectric media.	**(5)**
	(e)	Explain the radiation resistance, directivity, Beam-width and directive gain of the antenna.	**(5)**
2.	**(a)**	Derive an expression of Electric Field Intensity due to infinite surface charge at any point P on z axis, if surface charge is placed at z = 0 plane.	**(10)**
	(b)	State Biot-Savart law. Obtain the magnetic field intensity at point P due to a straight-line filamentary conductor lying on z-axis.	**(10)**
3.	**(a)**	State Poynting theorem and derive an expression for the Poynting vector. Explain the power terms mentioned in the derivation.	**(10)**
	(b)	Write a note on Smith chart and explain the steps involved to calculate SWR from the Smith Chart.	**(10)**
4.	**(a)**	Derive the expression of characteristic impedance of a transmission line.	**(10)**
	(b)	State and explain Maxwell's equations in differential and integral form for static and time varying fields.	**(10)**
5	**(a)**	Write short note on parabolic reflector antenna. Describe feeding techniques of parabolic reflector array.	**(10)**
	(b)	Explain in detail sources and characteristics of EMI. What are EMI control techniques.	**(10)**
6.	**(a)**	Derive an expression for reflection and transmission coefficient for normal incidence in case of reflection from perfect dielectric.	**(10)**
	(b)	Write Shot Notes on: (i) Types of Polarization (ii) Lossless Propagation	**(10)**