10-06-2026 TE ELECTRICAL SEM-V C SCHEME EMFW QP CODE: 20009260

Time: 3 Hours **Marks:80**

Note:

1. **Question No.1 is compulsory.**
2. **Solve ANY THREE questions from the remaining five questions.**
3. **Figure to the right indicates full marks.**
4. **Assume suitable data wherever required, but justify the same.**

		M
Q.1.	**Attempt any 4**	
a)	Define scalar and vector quantity with example.	**5**
b)	Derive the relation between $\bar{E}$ and electric potential V.	**5**
c)	"The line integral of the magnetic field around some closed loop is equal to the sum of the currents which pass through the loop". Justify the statement.	**5**
d)	State and explain coulomb's law in electrostatics. Hence define unit charge.	**5**
e)	Define Biot-Savarts law.	**5**
Q.2.	**Attempt All**	
a)	A Charge $Q_1 = -20\mu C$ is placed at P(-6,4,6) m and a charge $Q_2 = 50\mu C$ is placed at R(5,8,-2) m in free space. Calculate the exerted force on $Q_2 by\ Q_1$ in vector form.	**10**
b)	Given $\bar{E} = E_m\ sin\ sin\ (\omega t - \beta z)\ \overline{a_y}$ in free space, find $\bar{D}$, $\bar{B}$ and $\bar{H}$ at Y=0.	**10**
Q.3.	**Attempt All**	
a)	Use Biot-Savart's Law for any finite current carrying conductor to find magnetic field intensity.	**10**
b)	Show that the $\bar{E}$ due to infinite sheet of charge at a point is independent of the distance of that point from the plane containing the charge.	**10**
Q.4.	**Attempt All**	
a)	Derive point & integral form of Faraday's Law.	**10**
b)	Derive the wave equation in terms of time varying electric & magnetic field.	**10**
Q.5.	**Attempt All**	
a)	Draw rectangular, cylindrical and spherical co-ordinate system and explain differential element dl, differential surface ds and differential volume dv for all coordinate system.	**10**
b)	Explain Lorentz's force equation for moving charge. Enlist it's application.	**10**
Q.6.	**Attempt All**	
a)	Derive the Poission's and Laplasce equation. In Cartesian co-ordinate a potential is a function of x only. At $x = -2\ cm, V = 25\ V\ and\ E = -1.5 \times 10^3 \overline{a_x}\ V/m$ throughout the region. Find V at x=5 cm.	**10**
b)	Discuss the phenomenon of electric polarization in dielectric medium.	**10**

muquestionpapers.com

X525YB60A72X525YB60A72X525YB60A72X525YB60A72