C.U.SHAH UNIVERSITY Summer Examination-2020

Subject Name : Electromagnetics

	Subject	Code : 47	TE05EMS1	Branch: B.Tech (EC)		
	Semester	r : 5	Date : 28/02/2020	Time : 10:30 To 01:30	Marks : 70	
	Instructio (1) (1) (2) (1) (3) (1) (4) (2)	ons: Use of Pro Instruction Draw neat Assume su	ogrammable calculator & any ns written on main answer bo t diagrams and figures (if nec uitable data if needed.	y other electronic instrument is pr bok are strictly to be obeyed. cessary) at right places.	ohibited.	
Q-1		Attemp	t the following questions:			(14)
	 a) b) c) d) e) f) g) h) i) j) k) l) m) n) 	State Sta Define e Write th Define r What is List the Define r Define a Write M Define I Define I Mention State Ar Define i	okes' Theorem electric field density. he relation between magnetic magnetic field intensity Magnetization? types of magnetic materials. magnetic dipole. a vector field. Iaxwell's equation in point an Polarization. Pointing vector. In the properties of uniform pl mpere's circuital law ntrinsic impedance or charac	flux density and field intensity. nd integral form for good conduc ane wave.	tors .	
Atte	empt any f	four ques	tions from Q-2 to Q-8			
Q-2	(a)	Attemp Explain	t all questions Cylindrical Coordinate Syste	ems and Conversions.		(14) 07
Q-3	(b) (a)	Explain Attemp Describe	Gauss's law and its applicat t all questions e Biot –savarts law for magn	tions etic field.		07 (14) 07
	(b)	Explain	Metallic conductor and their	properties.		07



Q-4	(a)	Attempt all questions Briefly discuss skin effect and wave polarization.			
	(b)	Describe boundary conditions for Conducting materials	07		
Q-5		Attempt all questions	(14)		
	(a) (b)	Describe Uniqueness theorem.	07 07		
Q-6		Attempt all questions	(14)		
	(a)	Describe Coulomb's law for Electric Field Intensity	07		
Q-7	(b)	Describe Poynting's Theorem and Wave Power. Attempt all questions	07 (14)		
	(a)	The polarization within a region having relative permittivity of 2.7 has the	07		
		uniform value $\overline{P} = -0.2\bar{a}_x + 0.7\bar{a}_y + 0.3\bar{a}_z$ µC / m ² . Find (i) Electric Field			
		Intensity E (ii) Electric Field Density D (iii) the magnitude of the voltage			
		gradient.			
	(b)	Find the magnitude of the current density in a conductor if (i) the electric field	07		
		intensity is 0.09 V/m, the Volume charge density is $-2x10^{10}$ C/m ³ and the electron			
		mobility is 2.5 x 10^{-3} m ² /V s. (ii) There are 5 x 10^{28} conduction electrons / m ³ and			
		the electron drift velocity is 0.05 mm/s (c) $\mathbf{E} = 0.05$ V/m and the resistivity is			
		$2 \mathrm{x} 10^{-8} \Omega \mathrm{m}.$			
Q-8		Attempt all questions	(14)		

Q-8

- Attempt all questions Evaluate the Stokes' theorem for the field $\vec{H} = 6xy\vec{a_x} 3y^2\vec{a_y}\frac{A}{m}$ and the 07 **(a)** rectangular path around the region, $2 \le x \le 5, -1 \le y \le 1$ and z = 0. Let the positive direction of \overrightarrow{ds} be a_{z} .
- **(b)** Describe Maxwell's equations in integral form.



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