Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER–IV (NEW) EXAMINATION – WINTER 2020

Subject Code:3140912 Date:11/02/2021

Subject Name:Electromagnetic Fields

Time:02:30 PM TO 04:30 PM Total Marks:56

Instructions:

1. **Attempt any FOUR questions out of EIGHT questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

		MARKS
Q.1	**(a)** Explain cylindrical coordinate system in brief.	**03**
	(b) Explain Electrical dipole.	**04**
	(c) Explain spherical coordinate system and give the relationship between Cartesian and spherical coordinate system.	**07**
Q. 2	**(a)** State and explain Coulomb's law.	**03**
	(a) State and explain the Gauss's law.	**04**
	(b) Obtain equation for flux density due to infinite line charge using Gauss's law.	**07**
Q.3	**(a)** Define displacement current and current density.	**03**
	(b) Derive the point form of the continuity equation.	**04**
	(c) Obtain the Expression for field intensity **H** at the center of a circular carrying current **I**, using Biot-Savart law.	**07**
Q.4	**(a)** Explain concept of dot product and cross product.	**03**
	(b) Explain phenomenon of polarization.	**04**
	(c) Discuss Poisson's and Laplace equation.	**07**
Q.5	**(a)** Classify magnetic materials.	**03**
	(b) Explain the physical significance of the term: Curl of a vector.	**04**
	(c) Derive Maxwell's equation in integral and Point form.	**07**
Q.6	**(a)** Explain difference between steady magnetic field and time varying magnetic	**03**
	(b) Define divergence.	**04**
	(c) Explain Stoke's theorem with its mathematical expression.	**07**
Q.7	**(a)** Explain concept of electric potential difference.	**03**
	(b) State and explain Ohm's law in point form.	**04**
	(c) Explain boundary conditions between two perfect dielectric materials.	**07**
Q.8	**(a)** Explain concept of scalar magnetic potential and magnetic vector potential.	**03**
	(b) Explain Electrical field as the Gradient of the electrical potential.	**04**
	(c) State and explain ampere's circuit law, both in integral differential form as used in magnetic field.	**07**

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