K. J. Somaiya Institute of Technology, Sion, Mumbai-22
(Autonomous College Affiliated to University of Mumbai)

May-June 2024-25
B. Tech. Program: **Electronics and Telecommunication Engg.** Scheme: **IIB**
Regular Examination: **TY** Semester **VI**
Course Code: **EXC601** and Course Name: **Electromagnetics and Antenna**
Date of Exam: 27.05.25 Duration: 2.5 Hours Max. Marks: 60

Instructions:
(1). All questions are compulsory.
(2). Draw neat diagrams wherever applicable.
(3). Assume suitable data, if necessary.

Q. No	Question	Max. Marks	CO	BT level
Q 1	**Solve any two questions out of three: (05 marks each)**	**10**		
a)	Explain the followings. 1. Coulombs Law 2. Electric field Intensity 3. Gauss Law 4. Continuity equations 5. Laplace's and poisons equations		1	U
b)	Explain boundary conditions of E and H fields for two media.		2	U
c)	Evaluate the transmission line impedance equation.		3	E
Q 2	**Solve any two questions out of three: (05 marks each)**	**10**		
a)	Prove that the directivity of an isotropic antenna is unity.		4	U
b)	Design a Yagi-uda array antenna with directivity (relative to $\lambda/2$ dipole at the same height above ground) of 9.2 dB at the operating frequency of 50.1 MHz. The desired diameter of the parasitic elements is 2.54 cm and the metal supporting boom 5.1 cm. Find the element spacings, lengths and total array lengths. (Ref. Table: 10.6 & fig. 10.27)		5	Ap
c)	List the feed mechanism of microstrip antenna and Explain it in brief.		6	U
Q.3	**Solve any two questions out of three. (10 marks each)**	**20**		
a)	Solve for net force on Q4= 5 μC at (2, 2, 0) m if three equal point charges of 2μC are located at (0, 0, 0) m, (2, 0, 0) m and (0, 2, 0) m respectively in free space.		1	Ap

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