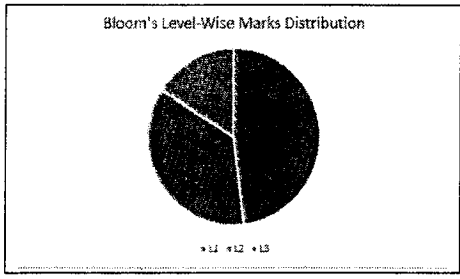
Roll No.:.....

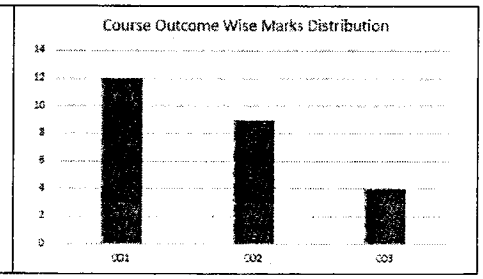
National Institute of Technology, Delhi

Re-Mid Semester Examination (Autumn 2023)

Branch	**: B. Tech.**	**Semester**	**: 5th**
Title of the Course	**: Antenna and Wave Propagation**	**Course Code**	**: ECL 301**
Time	**: 1.5 Hours**	**Maximum Marks**	**: 25**

Ques No.		Marks	COs	BL	PO
Q1.	a) What is meant by directivity b) What do you mean by front to back ratio c) Define HPBW and FNBW. d) Define EM waves e) Explain the equation $Z_{in} = N^2 Z_D$.	5*1=5	CO1	L1	1
Q2.	a) Draw the radiation pattern of directional antenna. b) Explain the reciprocity theorem in detail. c) Derive the total power radiated by half wave dipole.	2+2+3	CO1	L1	1
Q3.	a) Differentiate between electrically small loop antennas and electrically large loop antennas. List out the applications of loop antennas. b) Give an expression of radiation resistance of a small loop antennas and how to increase the radiation resistance of a loop antennas.	2+3	CO2	L2	2
Q4.	a) Explain the retarded vector potential in detail. b) Derive an expression for the power radiated by the current element and calculate the radiation resistance.	2+2	CO2	L2	2
Q5.	a) Write a short note on different types of apertures in antenna. b) Discuss any two types of feeding methods.	2+2	CO3	L3	2





BL – Bloom's Taxonomy Levels (1- Remembering, 2- Understanding, 3 – Applying, 4 – Analysing, 5 – Evaluating, 6 - Creating)
CO – Course Outcomes
PO – Program Outcomes; PI Code – Performance Indicator Code