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DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/MANAGEMENT/ COMMERCIAL PRACTICE, APRIL - 2025

ANTENNA AND WAVE PROPAGATION

[Maximum marks: 75] [Time: 3 Hours]

PART A

I. Answer all the following questions in one word or one sentence. Each question carries 1 mark.

(9 x 1 = 9 Marks)

		Module outcome	Cognitive level
1	The wave unaffected by night or day is …….	M1.02	U
2	The waves that propagates through tropospheric region is called ……. waves.	M1.03	R
3	Critical frequency of ionospheric layer, fc = ……	M2.02	U
4	Define virtual height in sky wave propagation.	M2.02	R
5	Write the name of the lowest layer of ionosphere.	M2.01	R
6	Define directivity of antenna.	M3.02	U
7	Radiation resistance of isolated half wave dipole is ……. ohms.	M3.03	R
8	Write an example for directional antenna.	M4.01	U
9	Name the type of antenna that produces standing waves.	M4.03	U

PART B

II. Answer any eight questions from the following. Each question carries 3 marks.

(8 x 3 = 24 Marks)

		Module outcome	Cognitive level
1	List any three features of ground wave propagation.	M1.02	R
2	Define line of sight. Write any two depending factors of LOS.	M1.03	U
3	Write any three salient features of duct propagation.	M1.03	U
4	Differentiate between phase velocity and group velocity.	M2.01	U
5	Define critical frequency and maximum usable frequency in sky wave propagation.	M2.02	R
6	Define Polarization of antenna. List any two types of polarization.	M3.01	U
7	Write any three functions of antenna.	M3.02	R
8	Define (i) reciprocity (ii) duality of antenna	M3.04	U
9	Write any three features of non-resonant antennas.	M4.01	U
10	Briefly describe about folded dipole antenna.	M4.01	U

PART C
Answer all questions. Each question carries seven marks.

(6 x 7 = 42 Marks)

		Module outcome	Cognitive level
III	Explain ground wave propagation and its features.	M1.02	U
	OR		
IV	What is duct propagation? List the salient features of duct propagation.	M1.03	U
V	Explain atmospheric effects in space wave propagation.	M1.03	U
	OR		
VI	Write the expression for field strength of ground waves. Explain the factors affecting the field strength of ground waves.	M1.02	U
VII	Explain different layers of ionosphere.	M2.01	U
	OR		
VIII	Describe the terms (i) Critical frequency (ii) Maximum usable frequency and (iii) skip distance in connection with ionospheric propagation.	M2.02	U
IX	Define (i) efficiency (ii) bandwidth (iii) directivity and (iv) gain of antenna.	M3.03	U
	OR		
X	Explain the radiation mechanism of an antenna.	M3.01	U
XI	Briefly explain different types of wire antennas.	M4.01	U
	OR		
XII	Diagrammatically show different types of horn antennas. Mention the applications of horn antennas.	M4.02	U
XIII	With a diagram explain micro strip antenna.	M4.02	U
	OR		
XIV	Define uniform linear antenna array. Write the salient features of uniform linear arrays.	M4.04	U

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