Roll No. | | | | | | | | | | | | |

Total No. of Questions: 09 **Total No. of Pages: 02**

B.Tech (ECE), Semester 3rd
ELECTROMAGNETIC WAVES
Subject Code: BTEC-303-18
M.Code:76446
Date of Examination: 16-05-2026

Time: 3 Hrs. **Max. Marks: 60**

INSTRUCTIONS TO CANDIDATES:

1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.**
3. **SECTION C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.**

Q No.	Description	CO	BL
	Section(A)		
1.	Answer briefly:		
a	What does a Smith chart represent?	CO-1	L1
b	Explain how transmission lines can act as inductors or capacitors at certain lengths?	CO-1	L2
c	State stroke's theorem.	CO-2	L1
d	Differentiate between static and time-varying Maxwell's equations.	CO-2	L2
e	How is average power density calculated in a uniform plane wave?	CO-3	L1
f	Outline the concept of pointing vector.	CO-3	L2
g	What is meant by the propagation constant, γ?	CO-4	L1
h	Illustrate total internal reflection.	CO-4	L2
i	Which parameters influence the propagation constant of a waveguide mode?	CO-5	L1
j	Distinguish between dominant & degenerate modes.	CO-5	L2
	Section(B)		
2	Examine different techniques of impedance matching in transmission line.	CO-1	L4
3	Explain various coordinate system of vectors used in electromagnetics.	CO-2	L3
4	Evaluate the relative orientation of electric field, magnetic field, and propagation direction in an electromagnetic wave.	CO-3	L5
5	Examine expression for electric field when wave is incident normally on the surface of perfect dielectric medium.	CO-4	L4
6	Compare characteristics of TE & TM mode for wave between parallel planes & rectangular waveguides.	CO-5	L5
	Section(C)		
7	A distortionless transmission line has characteristic impedance of 50 ohms, attenuation constant of 0.020 Db/m, phase velocity is 1.5 *106 m/s. Evaluate line parameters R, L, G & C.	CO-1	L5
8	Explain wave equations for free space.	CO-3	L5
9	Examine the reflection coefficient of a plane wave incident normally on a perfect dielectric medium by using boundary conditions.	CO-4	L4

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NOTE: Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the student.