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Reg. No. : | | | | | | | | | | |

Question Paper Code: 94402

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2024

Fourth Semester

Electronics and Communication Engineering

19UEC402– ELECTROMAGNETIC FIELDS AND TRANSMISSION LINES

(Regulation 2019)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART A - (5 x 1 = 5 Marks)

1. The product of E and H gives _____ unit. CO1-U

   (a) W/m^2 (b) V/m (c) A/m (d) m/A

2. Electromagnetic waves are produced by CO1-U

   (a) static charge (b) accelerated charge (c) moving charge (d) charged particle

3. When the load impedance is not equal to characteristic impedance of transmission line _____ takes place. CO2-U

   (a) Insertion (b) Reflection (c) both a and b (d) None of these

4. The points of zero voltage or current in the standing waves is CO2- U

   (a) Antinodes (b) loops (c) Nodes (d) none

5. Reflection results in____ CO2- U

   (a) Power loss (b) Current loss (c) Voltage loss (d) Impedance loss

PART – B (5 x 3= 15 Marks)

6. State faradays law and Lenz law CO1- U
7. What is Brewster angle? CO1- U
8. Mention the condition for stop band and pass band CO2-U
9. Define standing Wave ratio CO2-U
10. What are guided waves? Give examples CO2-U

PART – C (5 x 16= 80 Marks)

11.	(a)	Derive the expression for the capacitance of a coaxial cable using Laplace's equation.(if b>a V=0 at r=b and V=V0 at r=a)	CO3- Ana	(16)
		Or		
	(b)	(i) Derive the Maxwell equation for both integral and point form for time varying field.	CO3- Ana	(10)
		(ii) Derive Poisson and Laplace equation	CO3- Ana	(6)
12.	(a)	Derive the EM wave propagation parameters in Free space and also derive the expression for electric and magnetic field.	CO2-App	(16)
		Or		
	(b)	Derive the Transmission and reflection coefficient of uniform plane waves	CO2- App	(16)
13.	(a)	Design a constant k low pass filter with suitable filter sections	CO3- App	(16)
		Or		
	(b)	Design m-derived low pass filter having a cut off frequency of 5000Hz and design impedance of 600 ohms. The frequency of infinite attenuation is 1.25 fc	CO3- App	(16)
14.	(a)	Design a single stub match for a load of 150+j225 ohms for a 75 ohms line at 500 MHz using smith chart	CO5- Ana	(16)
		Or		
	(b)	Derive the expression for single stub matching	CO5- Ana	(16)
15.	(a)	Derive the field equations for TE waves between parallel planes.	CO6- Ana	(16)
		Or		
	(b)	Determine the solution of electric and magnetic fields of TE waves guided along rectangular waveguide.	CO6- Ana	(16)