C

Reg. No. :

Question Paper Code: 94402

B.E. / B.Tech. DEGREE EXAMINATION, MAY 2022

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   CO2-U
    transmission line _____ takes place.

    (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)

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