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Total No. of Pages : 02

Total No. of Questions : 18

B.Tech. (ECE) (2018 Batch) (Sem.-3)

ELECTROMAGNETIC WAVES

Subject Code : BTEC-303-18

M.Code : 76446

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.

SECTION-A**Write briefly :**

1. Compare magnetic scalar potential and magnetic vector potential.
2. Define Reflection Coefficient.
3. Mention the practical importance of smith chart.
4. Define Gradient. What does it indicate?
5. Define Phase Velocity.
6. What is Intrinsic Impedance?
7. For a symmetrical network, define propagation constant and characteristics impedance.
8. Find out the skin depth in copper, whose conductivity is $5.8 \times 10^7 \text{ S/m}$ and relative permeability is 1 at 10GHz.
9. State electrostatic boundary conditions.
10. State the properties of uniform plane wave.

SECTION-B

11. Deduce the wave equation for conducting medium.
12. Deduce the point form of Ampere's circuital law.
13. Derive Poynting vector and state its significance.
14. A distortionless transmission line has attenuation constant (α) of 1.15×10^{-3} Np/m and capacitance of 0.1×10^{-9} Farad per meter. The characteristic resistance = 50Ω . Find the resistance, inductance and conductance per meter of the line.
15. Describe Plane Wave Reflection.

SECTION-C

16. A rectangular air-filled copper waveguide with dimension $0.9 \text{ inch} \times 0.4 \text{ inch}$ cross section and 12 inch length is operated at 9.2 GHz with a dominant mode. Find its cutoff frequency, guide wavelength, phase velocity and characteristic impedance.
17. Clearly bring out the distinction between a standing wave and a propagating wave. What difference does it mean, in terms of power flow given by pointing vector in both these kinds of waves? Is standing wave finding an application anywhere? Why?
18. Discuss in detail surface currents on the waveguide walls.

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.