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Q 2215

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2007.

Sixth Semester

Electronics and Communication Engineering

EC 342 — EM WAVES AND WAVE GUIDES

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — ($10 \times 2 = 20$ marks)

1. Find the depth of penetration of a plane wave in copper at a power frequency of 50 Hz and at microwave frequency 10 GHz. Given $\sigma = 5.8 \times 10^7$ mho/m.

2. What is surface impedance? Specify its role in low and high frequency.

3. What is dominant mode? Give an example.

4. Give the constructional features of strip lines.

5. Why it is not possible to propagate a TEM waves inside a hollow waveguide of any cross-section?

6. Draw a neat sketch showing the variation of wave impedance with frequency of TE and TM waves in a waveguide.

7. Calculate the cut-off frequency of copper tube with 3 cm diameter inside with air filled, in TE_{11} mode.

8. Define attenuation factor of a waveguide.

9. What are the performance parameters of microwave resonator?

10. Give the methods of tuning a resonator.

PART B — ($5 \times 16 = 80$ marks)

11. (a) Derive the expression for total field when a horizontal polarized electromagnetic wave is incident obliquely on a perfect conductor.

Or

(b) (i) A plane 1000 MHz travelling wave in air with a peak electric field intensity 1 V/m is incident normally on a large copper sheet. Find the average power absorbed by the sheet per sq.m of the area. Take for copper $\mu_r = \varepsilon_r : 1$ and $\sigma = 5.8 \times 10^7$ mho/m.

(ii) A parallel polarized wave is incident from air into paraffin. Find the Brewster angle assuming ε_r for paraffin to be 2.

12. (a) Derive the electromagnetic field expressions for TM waves guided by a parallel plane perfectly conducting structure.

Or

(b) Derive an expression for attenuation factor for TM waves in between two parallel conducting planes.

13. (a) Derive the expressions of wave impedance of TE and TM waves in a rectangular waveguide.

Or

(b) An air filled rectangular waveguide mode of copper and having a = 7.2 cm and b = 3.4 cm operates at a frequency 3 GHz in the TE dominant mode. Find cut-off, guide wavelength and attenuation constant.

14. (a) An air filled circular waveguide has a radius of 1.5 cm and is to carry energy at a frequency of 10 GHz. Find all TE and TM modes for which transmission is possible.

Or

(b) A circular waveguide has a cut off frequency of 9 GHz in dominant mode.

(i) Find the inside diameter of the guide of it is air filled.

(ii) Determine the inside diameter of the guide if the guide is filled with a dielectric. The relative dielectric constant is $\varepsilon_r = 4$.

15. (a) Derive the expression for resonant frequency of TE and TM waves in circular cavity resonator.

Or

(b) Derive an expression for unloaded Q of a rectangular cavity.

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Q 2216

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2007.

Sixth Semester

Electronics and Communication Engineering

EC 343 — COMPUTER COMMUNICATION NETWORKS

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What is a peer-to-peer process?

2. How does a single-bit error differ from a burst error?

3. What are the functions of Data link control?

4. What are the three protocols used for noisy channels?

5. What is the relationship between a switch and a bridge?

6. What is the purpose of an NIC?

7. What is a transparent bridge?

8. Name the ATM layers and their functions.

9. What are the functions of session layer?

10. What is the difference between local and remote login in TELNET?

PART B — (5 × 16 = 80 marks)

11. (a) Explain the responsibilities of the seven layers of the OSI model of networks. (16)

Or

(b) Illustrate the concept of Cyclic Redundancy check with an example. (16)

12. (a) (i) What is framing? Explain fixed-size and variable-size framing. (10)

(ii) Explain piggy backing and its usefulness. (6)

Or

(b) Explain in detail any two error control protocols. (16)

13. (a) (i) Explain the persistence methods used in CSMA using flow diagrams. (8)

(ii) Explain the operation of Distributed queue Dual bus with a neat diagram. (8)

Or

(b) Explain the MAC sublayer used in IEEE 802.11 standards. (16)

14. (a) (i) What are the drawbacks of X.25 networks? (4)

(ii) Explain the features and architecture of a Frame Relay network. (12)

Or

(b) What are the connecting devices used in LAN? Explain their functions in detail. (16)

15. (a) Explain security in Internet. (16)

Or

(b) Write notes on :

(i) FTP (8)

(ii) Electronic mail. (8)