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# Question Paper Code : 41203

B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2013.

Sixth/Eighth Semester

Electronics and Communication Engineering

EC 1016 — WIRELESS NETWORKS

(Regulation 2008)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — ($10 \times 2 = 20$ marks)

1. For a given Bandwidth, which transmission technique among DFE, sectored antenna, MCM, DSSS and FHSS provides the highest data rate and which one consumes the minimum power.

2. In an OFDM modem with 48 channels, each channel uses 16-QAM modulation. If the overall transmission rate is 10 Mbps. What is the symbol transmission rate per channel?

3. Name the attributes that can be used to compare infrastructure and ad-hoc network topologies.

4. If total bandwidth available is 25 MHZ and bandwidth required for voice communication for each user is 30 KHZ. If one antenna is used to cover the entire town, calculate the number of simultaneous users.

5. In a GSM architecture which encoder is used to convert 13kbps digitized voice into 64kbps PCM digitized voice?

6. Encode the input bit stream (111010) using Walsh code?

7. What are the purposes of scrambler and inter-leaver in the HIPERLAN –2 Modem?

8. Name the challenges faced by WLAN industry?

9. What are the enhancements that need to be done in Bluetooth to implement Wireless Application Environment (WAE)?

10. When distance between two Bluetooth devices is 2m, $P_{BT}$ = 1mW, $S_{min}$ = 10dB and $P_{MT}$ = 100m W, compute the interference range between them.

PART B — (5 × 16 = 80 marks)

11. (a) The IS-136 digital cellular replaces the AMPS analog cellular. The modulation technique for the IS-136 is $\pi/4$-QPSK.

(i) What is the minimum required average SNR for the IS-136 modems if the minimum acceptable average error rate is $10^{-3}$ and the channel is assumed to be flat Rayleigh fading?

(ii) What is the threshold SNR if the acceptable error is $10^{-3}$ ?

(iii) With the average SNR of part (i) and the threshold SNR of Part (ii),What is the outage rate of the system?

Or

(b) Discuss the methods by which data services get integrated with voice-oriented Network?

12. (a) Derive the signal to interference ratio calculation performed in existing cellular architecture. Assume that you have six-sector cells in a hexagonal geometry. Draw the hexagonal grid corresponding to this case. Computer $S_r$ for reuse factors of 7, 4, and 3. Comment on your results.

Or

(b) Compare FCA and DCA frequency assignment technique? Discuss the requirements and overview of network security in wireless network.

13. (a) Explain the basic spreading procedure and processing carried out in pilot and synchronization channel of IS-95 forward channel.

Or

(b) Discuss the modifications performed in the existing GSM architecture to enhance the data rate by introducing packet service domain.

14. (a) Explain CSMA/CA and RTS/CTS MAC mechanism of 802.11 /WLAN.

Or

(b) (i) Compare and contrast both standards of WLAN with relevant reasoning and architectural Variations.

(ii) Discuss the Interference handling mechanism adopted in Bluetooth technology with all other ISM band technologies.

15. (a) Make a detailed answer on the architecture and technologies related to wireless geo-location system.

Or

(b) Make a detailed answer on the architecture and protocol stack of Bluetooth.

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