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Question Paper Code : 21467

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2015.

Seventh Semester

Electronics and Communication Engineering

EC 2401/EC 71/10144 EC 701 — WIRELESS COMMUNICATION

(Regulations 2008/2010)

(Common to PTEC 2401 — Wireless Communication for B.E. (Part-Time) Sixth Semester — ECE — Regulations 2009)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — ($10 \times 2 = 20$ marks)

1. Mention the operating frequency ranges for AMPS and ETACS systems.

2. Define mean excess delay and rms delay spread.

3. Define Co-channel Interference.

4. Define Coherence time.

5. What do you mean by Non-coherent Detection?

6. Draw the Constellation diagram of Binary Frequency Shift Keying system.

7. If a digital signal processing chip can perform one million multiplications per second, determine the time required between each iteration for the following adaptive equalizer algorithm LMS.

8. What is Transmit Diversity?

9. Draw the block diagram of a Direct Sequence Spread Spectrum Transmitter.

10. What is IS-95 Standard?

PART B — (5 × 16 = 80 marks)

11. (a) (i) With diagram explain Personal Access Communication system. (8)

(ii) Briefly explain ETACS System. (8)

Or

(b) (i) Explain some techniques intended to improve the coverage area and capacity of cellular system. (8)

(ii) Analyze co-channel interference and adjacent channel interference and suggest some measures to reduce them. (8)

12. (a) Derive the expressions for the total Electric field, $E_{TOT}(d)$ and received power at distance, $P_r(d)$ using two – ray ground reflection model. (16)

Or

(b) The fading characteristics of a CW carrier in an urban area are to be measured. The following assumptions are made :

(i) The mobile receiver uses a simple vertical monopole.

(ii) Large-scale fading due to path loss is ignored.

(iii) The mobile has no line-of-sight path to the base station

(iv) The pdf of the received signal follows a Rayleigh distribution

(1) Derive the ratio of the desired signal level to the rms signal level that maximizes the level crossing rate. Express your answer in dB. (5)

(2) Assuming the maximum velocity of the mobile is 50 km/hr, and the carrier frequency is 900MHz, determine the maximum number of times the signal envelope will fade below the level found in (1) during a one minute test. (6)

(3) How long, on average, will each fade in (2) last? (5)

13. (a) Derive the expression for MSK signal as a special type of continuous phase FSK signal.

Or

(b) Explain in detail about the Gaussian Minimum Shift Keying (GMSK) Transmission and Reception with necessary diagrams.

14. (a) Explain in detail about Space diversity with necessary diagrams

Or

(b) Derive the LMS Algorithm for an Adaptive Equalizer.

15. (a) Explain in detail about various spread spectrum multiple access techniques with neat block diagrams.

Or

(b) Draw the basic arrangement of multitone OFDM transceiver and discuss its overall operation.

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