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Q 2337

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

Sixth Semester

Information Technology

IF 365 — MOBILE COMMUNICATION

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What do you understand by frequency reuse?
2. What is Hard Hand Off and Soft Hand Off?
3. A sinusoidal modulating signal $m(t) = 4 \cos 2\pi 2 \times 10^3 t$ is applied to an FM modulator that has a frequency deviation constant gain of 5 KHz/V. Compute the peak frequency deviation and the modulation index.
4. What do you mean by spectral efficiency?
5. Differentiate between large scale propagation model and small scale propagation model.
6. List various diversity techniques used in mobile communication.
7. What are the advantages of Digital Cellular Systems over analog cellular systems?
8. In the following air interface standards, identify the multiple access technique used.
 - (a) AMPS
 - (b) GSM
 - (c) IS-95 and
 - (d) IS-136.

9. What is the basic difference between satellite orbits and constellations?
10. What are LEO and MEO system? And give their altitude ranges.

PART B — (5 × 16 = 80 marks)

11. (a) (i) Draw the block diagram of cellular mobile telephone system and explain each block. (10)
- (ii) If a total bandwidth of 40 MHz is allocated to a particular FDD cellular telephone system which uses two 12.5 KHz simplex channels to provide full duplex voice and control channels. Calculate the number of channels available per cell if a system uses, 4-cell and 7-cell and 12-cell clusters. (6)

Or

- (b) (i) Explain the handoff scenario at cell boundary. (8)
- (ii) Explain the various technique to improve coverage and capacity in mobile phone cellular systems. (8)
12. (a) (i) What are advantages and disadvantages of digital modulation techniques over analog modulation techniques? Explain. (4)
- (ii) What do you understand by Gaussian MSK? Explain. (4)
- (iii) Compare the performance of various digital modulation techniques. (8)

Or

- (b) (i) Differentiate between spectrum efficiency and bit error rate and explain. (6)
- (ii) Plot the BER versus E_b/N_0 performance of GMSK, GFSK and DQPSK modulation techniques in wireless system and explain briefly. (7)
- (iii) List advantages and disadvantages of each modulation methods said above from the mobile communications standpoint. (3)

13. (a) (i) Draw the point-to-point propagation model in mobile propagation and explain. (6)
- (ii) Explain the three basic propagation mechanisms in mobile communication. (6)
- (iii) What are the factors influencing the small scale fading? And explain briefly. (4)

Or

- (b) (i) What is tilting effect? And explain the gain and radiation pattern relationship in mobile antennas. (6)
- (ii) What is smart antenna? And compare with other antennas. (4)
- (iii) Explain the various diversity techniques in mobile communication. (6)
14. (a) (i) Explain the key parameters of the following second generation cellular mobile networks :
- (1) GSM
- (2) IS-136 and
- (3) IS 95. (12)
- (ii) Compare and contrast 2G mobile phone networks with 2.5 G mobile phone networks. (4)

Or

- (b) (i) What are the advantages of CDMA mobile networks over TDMA Mobile Networks? (6)
- (ii) Explain the evolution of third generation (3G) Wireless Mobile Networks. (10)
15. (a) (i) Explain the architecture of the satellite system. (8)
- (ii) Draw the constellations diagram of the Iridium Satellite and explain. (8)

Or

- (b) (i) Explain global positioning system. (4)
- (ii) Explain the following :
- (1) VSAT and
- (2) DBS. (4 + 8)
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