Register Number: ……….………

M.E DEGREE EXAMINATIONS: APRIL/MAY 2010

Second Semester

APPLIED ELECTRONICS

ANE520: Cellular and Mobile Communication

Time: Three Hours   **Maximum Marks: 100**

Answer ALL Questions:-

PART A (10 x 2 = 20 Marks)

1. Distinguish between 1G, 2G, 2.5G and 3G wireless standards.

2. State the advantages of WLL.

3. How is full duplex communication achieved in mobile wireless?

4. Define Erlang.

5. What is a link budget in wireless communication?

6. Explain Doppler spread.

7. What is spectral efficiency of a digital modulation scheme?

8. What is diversity technique?

9. Compare associated channel signaling and common channel signaling.

10. Differentiate between circuit switching and packet switching.

PART B (5 x 16 = 80 Marks)

11. (a) (i) Discuss the basic principle behind cellular wireless communications. (8)

    (ii) Write a short note on satellite communications. (8)

(OR)

  (b) (i) Compare the different generations of cellular communications with respect to their

       salient features. (8)

    (ii) Write a short note on paging systems and wireless local loop. (8)

12. (a) (i) Discuss the frequency reuse concept and assignment of channels among the different

       cells in a cluster. (8)

    (ii) A cellular system using a cluster size of seven is operated with 660 channels, 30 of

    which are designated as control channels so that there are about 90 voice channels / cell.

    If there is a potential user density of 9000 users / km^2 in the system, and each user

makes an average of one call per hour that lasts one minute during peak hours, determine the probability that a user will experience a delay greater than 20 sec. if all calls are queued. P_r (delay) = 0.05, R = 1.387 km (8)

(OR)

(b) (i) Derive the signal-to-interference ratio in a typical cellular system. (8)

 (ii) Discuss the handoff issues in cellular communications. (8)

13. (a) (i) Derive the path loss equation for the two ray ground reflection model. (8)

 (ii) Describe the different types of fading in mobile systems. (8)

(OR)

(b) (i) Explain the Durkin's model used in outdoor propagation path loss computations. (8)

 (ii) Write a short note on antenna systems used in mobile radio. (8)

14. (a) (i) Describe the GMSK modulation technique in detail. (8)

 (ii) Explain how error protection is done with cyclic codes. (8)

(OR)

(b) (i) Explain the LPC speech coder in detail. (8)

 (ii) With a neat diagram, explain the concept of RAKE receiver. (8)

15. (a) (i) Compare the different multiple access techniques. (8)

 (ii) With a block diagram, describe the ISDN. (8)

(OR)

(b) (i) Describe the signaling system No. 7 protocol. (8)

 (ii) If GSM uses a frame structure where each frame consists of 8 time slots and each time slot contains 156.25 bits and data is transmitted at 270.833 kbps in the channel, find: the time duration of a bit, time duration of a slot, time duration of a frame and the time duration between two successive transmissions of a single user. (8)

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