Seventh Semester B.E. Degree Examination, December 2010
Wireless Communication

Time: 3 hrs. Max. Marks:100

Note: ***Answer any FIVE full questions, selecting at least TWO questions from each part.***

PART – A

1 a. With an appropriate diagram, explain the OSI model. How does it relate to network communications? **(10 Marks)**

b. Describe the characteristics of 1G, 2G and 2.5G cellular systems. Explain the differences between these systems. **(10 Marks)**

2 a. i) Write explanatory notes on identification numbers and their applications as cellular network components.

ii) Discuss "Global title" and "Global Title Translation" (GTT) and their importance. Use appropriate diagrams to substantiate your answer. **(10 Marks)**

b. With a suitable diagram, explain the steps involved in a mobile terminated call operation. **(10 Marks)**

3 a. With suitable illustrations, discuss the cellular concept. Explain the advantages of frequency reuse. **(06 Marks)**

b. Discuss the various technique employed to expand the capacity of a cellular system. Use diagrams to support your answer. **(10 Marks)**

c. Explain the following terms in the context of wireless cellular systems :
i) Discontinuous transmission ; ii) Sleep mode. **(04 Marks)**

4 a. With a neat diagram of system architecture of the GSM wireless system, explain the functions of the components present therein. **(10 Marks)**

b. With suitable diagrams, explain the GSM channel concept. **(10 Marks)**

PART – B

5 a. Explain the TDMA frame structure used in the GSM cellular systems. In this context, describe a typical GSM "normal burst". **(10 Marks)**

b. With a pictorial representation; explain the GSM operations of the Inter – BSC handoff. **(10 Marks)**

6 a. i) Explain the unique concept of CDMA technology.

ii) Explain how additional CDMA system capacity is achieved.

iii) What are "Walsh codes"? Describe how these codes are used for generating the CDMA reverse logical channel signals. **(10 Marks)**

b. Explain soft, softer, soft softer and hard handoffs in CDMA systems. Describe the generation of the active and candidate pilot set for CDMA handoff operations. **(10 Marks)**

7 a. Explain the three basic EM wave propagation effects that are most likely to affect cellular wireless operations. **(08 Marks)**

b. i) Explain the term, "multipath" in the context of EM wave propagation.

ii) Explain the basic difference between the two – ray and the free space path loss models. **(04 Marks)**

c. Determine the received power in dBm for a signal in free space with a transmitting power of 1W, frequency of 1900 MHz, and distance from the receiver of 1000 meters, if the transmitting antenna and receiving antenna both use dipole antennas with gains of approximately 1.6. What is the path loss in dB? **(08 Marks)**

8 a. Explain the typical Bluetooth scatternet structure, with a neat block diagram. **(08 Marks)**

b. i) Explain the function/purpose of the Bluetooth "sniff" mode.

ii) For a wireless PAN device, describe the "hold" and "park" modes. **(06 Marks)**

c. With the aid of a flowchart, explain the subscriber station automatic network entry and initialization operations for IEEE 802.16. **(06 Marks)**

* * * * *