(3 Hours) [Total Marks: 80]

N.B: (1) Question No.1 is compulsory.
(2) Answer any **four** from remaining **six** questions.
(3) Assumptions should be made whenever required and should be clearly stated
(4) Answers to sub questions should be answered together
(5) Illustrate answers with diagrams whenever necessary

1. (a) What are the functions of authentication and encryption in GSM? How the [10] system security is maintained?

(b) What are the different types of control channels in GSM? Explain how and what [10] control channels are used for mobile originated and terminated calls in GSM.

2. (a) What is spread spectrum? Explain the Direct Sequence Spread Spectrum in [08] detail.

(b) Explain with the state diagram how the bluetooth devices changes from the [07] standby state to the active state

3. (a) What modifications are made to the architecture to accommodate GPRS. Explain [08] with the help of the diagram with its components.

(b) What is a convolution code? Draw a shift register and state diagram for the [07] encoder (2,1,3)

4. (a) Explain the indirect TCP and Snooping TCP with its advantages and [08] disadvantages

(b) Give reasons for a handover in GSM and the problems associated with it. What [07] types of handover can occur?

5. (a) Explain the IEEE 802.11 system architecture with diagram. Discuss the services [08] provided by IEEE 802.11

(b) Discuss the following impairments in wireless environments. [07]
(i) Atmospheric absorption (ii) Multipath Propagation (iii) Fading

6. (a) List the entities of mobile IP and describe data transfer from a mobile node to a [08] fixed node and vice versa. Why and where is encapsulation needed?

(b) Discuss IEEE 802.16 architecture and its services. [07]

7. Write short notes any **three** of the following: [15]

(a) Hidden and Exposed terminals   (b) Different types of short messages
(c) Tromboning   (d) SyncML