

# END TERM EXAMINATION

SEVENTH SEMESTER [B.TECH.] FEBRUARY 2023

Paper Code: ETEC405

Subject: Wireless Communication

Time: 3 Hours

Maximum Marks: 75

**Note: Attempt five questions in all including Q.No.1 which is compulsory. Select one question from each unit.**

- Q1 Answer the following briefly: (2.5x10 =25)
- What modifications are required in GSM architecture to support GPRS traffic.
  - Explain RTS and CTS frames with respect to WLANs
  - Explain Encapsulation & Tunnelling in Mobile IP networks with relevant diagrams.
  - Explain piconets and scatternets in Bluetooth technology with diagrams.
  - Explain the concept of cell sectoring in Cellular Mobile networks with help of a neat diagram.
  - Differentiate between soft handoff and hard handoff.
  - Compare & contrast FDMA, TDMA & CDMA. Why is CDMA said to have a soft capacity.
  - Give Differences between W-CDMA and CDMA 2000.
  - Explain how infrastructure networks are different compared to adhoc networks.
  - Explain the Spread spectrum technique of FHSS with supporting diagram.

## UNIT-I

- Q2
- With help of a flow chart discuss the Subrating scheme of channel assignment for handling the mobile calls. (4)
  - What is meant by different Generation of Wireless Networks? When do we conclude that the Generation has changed? Compare the various Generations of Wireless networks & their types w.r.t. Mobility, Range, Speed of Transmission Radio spectrum used. (4)
  - Given a Cellular system in which there are a total of 1001 radio channels available for handling traffic. It is also given that the area of a cell is 6 km<sup>2</sup> and the area of the entire system is 2100 km<sup>2</sup>.
    - Calculate the system capacity if the cluster size is 7.
    - How many times would the cluster of size 4 have to be replicated in order to approximately cover the entire cellular area.
    - Calculate the system capacity if the cluster size is 4. (4.5)
- Q3
- What do you understand by fading in wireless channels? Explain the different types of fading that occur in wireless networks and state the conditions under which they occur. (12.5)

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**UNIT-II**

- Q4     a) Explain how data encryption is done in GSM systems, with diagram, explaining the role of SIM, A3, A5 and A8 algorithms. **(6)**  
       b) Explain the logical channels of GSM along with the classification chart and also state whether that channel is uplink channel or downlink channel. **(6.5)**
- Q5     a) Explain the principle of CDMA systems and how is power control done in them? **(6)**  
       b) Discuss the effects of multipath propagation on CDMA systems. **(6.5)**

**UNIT-III**

- Q6     a) Explain the Data rate enhancement with the help of General Packet Radio Services (GPRS) Network model. What is the maximum data rate obtained by GPRS network? **(6)**  
       b) Discuss about the quality of services in 3G and mention the limitations as well. **(6.5)**
- Q7     a) Explain the features of medium access and Inter frame Spacing aspects of a typical wireless LAN scenario. **(6.5)**  
       b) How the agent can be discovered using Mobile IP? Give the overlay of Agent advertisement packet which includes mobility extension. **(6)**

**UNIT-IV**

- Q8     With help of a diagram show the different states of a Bluetooth device. List the different power saving states of a Bluetooth device. Discuss in detail about Bluetooth protocol stack. **(12.5)**
- Q9     Compare the case studies of IRIDIUM and GLOBAL STAR systems along with features of constellation of satellite in both cases. Discuss about uplink and down link chains as well mobile satellite. **(12.5)**

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