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Total Number of Pages: 02

Course: IDD (B.Tech and M.Tech)
Sub_Code: REC6C002

6th Semester Regular/Back Examination: 2024-25

SUBJECT: WIRELESS COMMUNICATION

BRANCH(S): ECE, ETC

Time: 3 Hours

Max Marks: 100

Q.Code : S139

Answer Question No.1 (Part-1) which is compulsory, any eight from Part-II and any two from Part-III.

The figures in the right-hand margin indicate marks.

Part-I

Q1 Answer the following questions: (2 x 10)

- Write four examples of wireless communication systems.
- What is umbrella cell concept?
- Define Co-channel reuse ratio.
- What is frequency reuse?
- Define frame efficiency in TDMA system.
- Distinguish between multiplexing and multiple access technique.
- List the various features of 5G wireless technology.
- What is the need of HLR and VLR in GSM system?
- List the challenges of WiFi and Bluetooth technology.
- Why uplink frequency is high in satellite communication.

Part-II

Q2 Only Focused-Short Answer Type Questions- (Answer Any Eight out of Twelve) (6 x 8)

- Explain about handoff process in detail.
- What is signal to interference ratio (SIR)? Derive it.
- If 70 W is applied to a unity gain antenna with a 750 MHz carrier frequency, find the received power in dBm at a free space distance of 1.5 km from the antenna. Assume unity gain for receiving antenna.
- How to improve the coverage and capacity in a cellular communication system.
- What is signal fading, propagation path loss? Explain in detail about various path loss models.
- Explain about TDMA frame structure with neat diagram.
- Consider the AMPS system in which an SIR ratio of 20 dB is required for the accepted voice quality. What should be the reuse factor for the system? Assume path loss exponent is 2.5. What will be the reuse factor of the GSM system in which an SIR of 14 dB is required?

- h) What is near far problem in CDMA? How to overcome it?
- i) Sketch and Explain LTE network architecture and various interfaces.
- j) Explain about GPS navigation system in detail.
- k) What is the principle of air traffic control, explain in detail?
- l) Write short notes on (I) LTE WiFi (II) 5G Technology.

Part-III

Only Long Answer Type Questions (Answer Any Two out of Four)

(16 x 2)

- Q3** How a mobile call can be established? Explain with proper routing. Draw the cellular structure diagram for a geographical area having three clusters, with frequency reuse of (a) 7 cells/cluster (b) 12 cells/clusters, and assign frequency bands properly to each cell. **(16)**
- Q4** Explain in detail about various multiple access techniques, their merits and demerits with neat diagrams. **(16)**
- Q5** Draw the GSM architecture, explain about it in detail? What are various other RF technologies, their applications and challenges in detail **(16)**
- Q6** Explain in detail about wireless communication system evolution from 1G to 5G. What is mobile satellite communication? Mention its merits, demerits, challenges? **(16)**