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Eighth Semester B.E. Degree Examination, Dec.2024/Jan.2025

Wireless and Cellular Communication

Time: 3 hrs.

Max. Marks: 100

Note: *Answer any FIVE full questions, choosing ONE full question from each module.*

Module-1

1 a. Explain two ray ground reflection model and obtain the expression for E-field, path difference, phase difference and time delay. **(10 Marks)**
   b. If a transmitter produces 50 W of power, express the transmit power in units :
   i) dBm ii) dBw. If 50 W is applied to a unity gain antenna with a 900 MHz carrier frequency, find the received power in dBm at a free space distance of 100 m from the antenna. What is P_r(10 km., Assume $G_r = 1$. **(10 Marks)**

OR

2 a. Explain cellular concept and sectoring to improve the capacity of the cell. **(10 Marks)**
   b. Explain :
   i) Doppler spread and coherence time
   ii) Delay spread and coherence bandwidth
   iii) Angular spread and coherence distance. **(10 Marks)**

Module-2

3 a. Explain the various logical channel used in GSM. **(10 Marks)**
   b. With a neat diagram, explain GSM network and system architecture. **(10 Marks)**

OR

4 a. Define handoff and explain how call handoff is done in GSM technology. **(10 Marks)**
   b. List out the ten operations in call setup in GSM system. Explain in detail authentication and ciphering mode operation. **(10 Marks)**

Module-3

5 a. Explain CDMA spread spectrum operations in forward logic channels. **(10 Marks)**
   b. Explain the steps involved in call establishment in CDMA technology. **(10 Marks)**

OR

6 a. Explain the different types of soft and hard handoffs supported by CDMA system. **(10 Marks)**
   b. Explain the generation of reverse logical channels in CDMA technology. **(10 Marks)**

Module-4

7 a. Explain key enabling technologies and features of LTE system in detail. **(10 Marks)**
   b. Explain with a neat diagram, how 3GPP network evolved towards flat LTE-SAE architecture. **(10 Marks)**

OR

8 a. With a neat block diagram, explain OFDM communication system. Also mention the need of timing and frequency synchronization. **(10 Marks)**
   b. Discuss the significance of PAR problem in LTE. Briefly explain PAR reduction techniques. **(10 Marks)**

Module-5

9 a. Briefly explain the different multiple access system which can be implemented with FDAM. **(10 Marks)**
   b. With a neat diagram, explain SC–FDMA. List out the advantages and disadvantages of SC–FDMA. **(10 Marks)**

OR

10 a. Explain the different logical, transport and physical channels supported in KTE. **(10 Marks)**
    b. Explain Uplink SC-FDMA radio resources in LTE system. **(10 Marks)**

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