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Eighth Semester B.E. Degree Examination, July/August 2022
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 in brief the basic three propagation mechanisms. **(06 Marks)**

b. Define :
   i) Delay spread
   ii) Coherence bandwidth
   iii) Doppler spread
   iv) Coherence time. **(08 Marks)**

c. Assume a receiver is located 10km from a 50W transmitter. The carrier frequency is 900MHz, free space propagation is assumed, $G_t = 1$, $G_r = 2$, find :
   i) The power at the receiver
   ii) The magnitude of E-field at the receiver antenna
   iii) The rms voltage applied to the receiver input assuming that the receiver antenna has real impedance of 50Ω and is matched to the receivers. **(06 Marks)**

OR

2 a. Explain cell splitting and cell sectoring. **(06 Marks)**

b. Explain the three statistical channel model of a broadband fading channel. **(09 Marks)**

c. If a transmitter produces 50Watts of power, express the transmit power in units of
   i) dBm and dBw
   ii) if 50Watts is applied to a unity gain antenna with a 900MHz frequency of carrier, find the received power in dBm at a free space distance of 100m from the antenna. **(05 Marks)**

Module-2

3 a. Explain with neat block diagram GSM network architecture. **(10 Marks)**

b. Explain GSM Hyper frame with neat sketch. **(10 Marks)**

OR

4 a. Explain GSM identities. **(10 Marks)**

b. Explain the types of GSM location updating. **(10 Marks)**

Module-3

5 a. Explain the CDMA basic spectrum spreading operation with necessary sketches. **(10 Marks)**

b. Explain forward logical channels of CDMA. **(10 Marks)**

OR

6 a. Explain CDMA mobile station initialization and call processing states. **(12 Marks)**

b. Explain the types of handoff used in CDMA. **(08 Marks)**

Module-4

7 a. Explain OFDM advantages and disadvantages.   (10 Marks)
   b. Explain with neat block diagram flat LTE SAE architecture.   (10 Marks)

OR

8 a. Explain the differences between OFDM and SCFDE with neat block diagrams.   (10 Marks)
   b. Write a note on :
      i) Frequency synchronization
      ii) The Peak to Average Ratio (PAR)   (10 Marks)

Module-5

9 a. Explain with neat block diagram OFDMA downlink transmitter.   (10 Marks)
   b. Mention SC-FDMA advantages and disadvantages.   (05 Marks)
   c. Mention OFDMA advantages and disadvantages.   (05 Marks)

OR

10 a. Explain LTE end to end network architecture with neat block diagram.   (10 Marks)
   b. Explain LTE frame structures.   (10 Marks)

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