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18EC81

## 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  $50\Omega$  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)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.

**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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