## CBCS SCHEME

USN

15EC81

# Eighth Semester B.E. Degree Examination, Dec.2019/Jan.2020 Wireless Cellular and LTE 4G Broadband

Time: 3 hrs. Max. Marks: 80

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

#### Module-1

a. List the advantages of OFDM leading to its selection for LTE and explain.
 b. Discuss the delay spread and coherence bandwidth with relevant expressions.
 (08 Marks)

#### OF

- Write the block diagram of end to end architecture of EPC supporting current and legacy Radio access networks and discuss the elements of EPC. (08 Marks)
  - b. Consider a user in downlink of a cellular system where the desired base station is at a distance 0.5 KM and the interfering base stations (i) B<sub>1</sub> and B<sub>2</sub> located at a distance of 1.0 KM, (ii) B3, B4 and B5 located at a distance of 2 KM (iii) B6 to B11 treated at a distance of 2.66 KM. Each of the stations transmitted power at the same level. Find the SIR when the path loss exponent α = 3 and also when α = 5.

## Module-2

- a. With the help of neat diagrams explain how the timing and frequency synchronization is performed by the receiver to demodulate an OFDM signal. (08 Marks)
  - b. Write the block diagrams of receive diversity and explain the principle of operation.
    (08 Marks)

#### OR

- Write the block diagram of OFDMA down link transmitter and explain the principle of operation. (08 Marks)
  - Explain the spatial multiplexing MIMD system and the key points of single user MIMD system model.
     (08 Marks)

## Module-3

- 5 a. Discuss the radio interface protocol stock of LTE. (08 Marks)
  - b. Write the structure of downlink resource grid and explain the types of resource allocation.
    (08 Marks)

#### OR

- 6 a. Write the Frame structure Type 2 and explain the various fields applicable to TDD mode.
  (08 Marks)
  - Discuss the Broadcast channels and multicast channels.

#### Module-4

- a. With the help of a neat block diagram, explain the SC-FDMA base band signal generation.
  (08 Marks)
  - Discuss the random access procedures in detail.

(08 Marks)

(08 Marks)

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inportant 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.

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#### OR

- Explain the seven different transmission modes, defined for data transmission on the PDSCH channel.

  (07 Marks)
  - b. Discuss the scheduling and resource allocation in LTE.

## (09 Marks)

#### Module-5

- 9 a. Explain the main services and functions of the PDCP.
  - b. Describe the various phases of S1 mobility with a neat diagram.

#### (08 Marks) (08 Marks)

- OR
- 10 a. Explain the data transfer modes and the main services and functions of the RLC sublayer.

(08 Marks)

b. Discuss the intercell interference coordination in downlink and uplink.

(08 Marks)

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