

# CBCS Scheme

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16ECS41

Fourth Semester M.Tech. Degree Examination, June/July 2018

## Wireless Broadband LTE 4G

Time: 3 hrs.

Max. Marks: 80

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

### Module-1

- 1 a. With neat diagrams, explain the specifications of LTE with responsible working groups and explain the 3GPP structure. (08 Marks)
- b. Draw the system architecture for E-UTRAN only network and explain the four main high level domains. (08 Marks)

OR

- 2 a. Explain in brief, the Mobility Management Entity (MME) and show the MME connections to other logical nodes and main functions. (08 Marks)
- b. Mention the various additional and updated logical elements in 3 GPP inter-working system architecture configuration for E-UTRAN and legacy 3 GPP access networks and explain E-UTRAN, UTRAN and GERAN in brief. (08 Marks)

### Module-2

- 3 a. With neat diagrams, explain the multiple access background in LTE networks. (08 Marks)
- b. With the help of block diagram, explain the SC-FDMA transmitter and receiver with frequency domain signal generation. Explain how the data rate is adjusted and how resource mapping is done in SC-FDMA. (08 Marks)

OR

- 4 a. List the various transport channels and explain briefly how they are mapped to the physical channels. (08 Marks)
- b. Explain the different downlink transmission modes defined in LTE release 8. (08 Marks)

### Module-3

- 5 a. Discuss the physical layer procedures – power control, timing advance and random access in a LTE system. (08 Marks)
- b. Explain how data flow is handled at the MAC layer with MAC PDU structure and payload types. (08 Marks)

OR

- 6 a. Explain the three different modes of operation of the Radio Link Control (RLC) Layer. (04 Marks)
- b. Compare periodic and aperiodic channel state feedback reporting in LTE. (04 Marks)
- c. With the help of a block diagram, explain the Packet Data Convergence Protocol (PDCP) layer operation for the packets associated with PDCP Service Data Units (SDC). (08 Marks)

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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. What are the functions provided by Radio Resource Control (RRC) protocol layer? Explain the intercell and intracell handover procedures. (08 Marks)  
b. Explain the RRC connection setup procedure with a diagram. (04 Marks)  
c. What are the functionalities of X<sub>2</sub> application protocol (X<sub>2</sub> AP)? Explain how handover operation is managed at the X<sub>2</sub> – interface. (04 Marks)

OR

- 8 a. Bring out the differences in mobility between UTRAN and E-UTRAN networks. (06 Marks)  
b. What are the factors on which the handover frequency in the network depends upon? (04 Marks)  
c. List the main parameters for idle mode mobility and describe each one of them. (06 Marks)

Module-5

- 9 a. What do you mean by Buffer Status Report (BSR)? Explain in detail how the triggering and reporting phases are handled in the LTE buffer status reporting. (08 Marks)  
b. Tabulate the Discontinuous Reception (DRX) related parameters and give the example settings and purpose of each of the parameter. Describe each one of these parameters. Show a simple illustration of DRX parameters. (08 Marks)

OR

- 10 a. Illustrate the LTE reforming to GSM spectrum with diagrams. (05 Marks)  
b. Perform the traffic volume based dimensioning and data rate based dimensioning by taking an example of 1+1+1 network at 20 MHz. Comment on the results. (07 Marks)  
c. What are the key indicators in cell performance analysis? Explain. (04 Marks)

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