

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)

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 X₂ application protocol (X₂ AP)? Explain how handover operation is managed at the X₂ – 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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