CBCS SCHEME

USN | | | | | | | | | | |

18EC81

Eighth Semester B.E. Degree Examination, June/July 2023
Wireless and Cellular Communication

Time: 3 hrs. Max. Marks: 100

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

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-1

1 a. Derive the Friis free space equation for power received by an antenna situated at a distance 'd' for free space propagation model. **(10 Marks)**

b. Find the received power level at a distance of 10km. Given a transmitter produces 50W of power.
i) Express the transmit power in dBm
ii) Express the transmit power in dBw
If d_0 is 100m and the received power at that distance is 0.0035mw, then assume that the transmit and receive antennas have unity gains. **(08 Marks)**

c. Define the following terms :
i) Path loss
ii) Antenna gain. **(02 Marks)**

OR

2 a. Derive the Total Electric Field [E_{Total}] Equation For Ground Reflection [Two – Ray] model. **(10 Marks)**

b. Give the following geometry, determine :
i) The loss due to knife – edge diffraction
ii) The height of the obstacle required to induce 6 dB diffraction loss. Assume f = 900MHz.

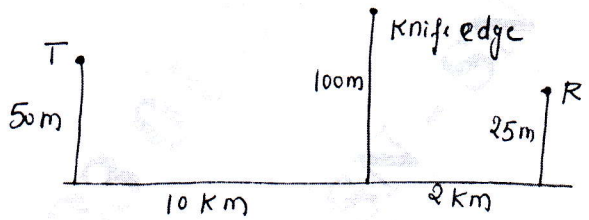

Fig.Q2(b) **(10 Marks)**

Module-2

3 a. Discuss GSM signaling model with a neat diagram. Explain signaling between the MSC, BSS and MS in a GSM system. Also explain signaling over the GSM after interface. **(12 Marks)**

b. Explain GSM hyper frame with a neat diagram. **(08 Marks)**

OR

4 a. List out the ten operations in call setup in GSM system, explain in detail Ciphering mode setting and IMEI check. **(10 Marks)**

b. Explain with detailed flow diagram, the call handover in GSM inter BSC system. **(10 Marks)**

Module-3

5 a. Explain the elements of the cdma2000 packet core network. **(06 Marks)**

b. Explain CDMA access channel probing. **(08 Marks)**

c. Explain various types of CDMA handoff. **(06 Marks)**

OR

6 a. Explain the major components of a cdma2000 wireless system with details of network nodes. **(08 Marks)**

b. Explain the generation of the CDMA paging channel signal with a relevant diagram. **(06 Marks)**

c. Explain generation of the CDMA reverse traffic channel with a relevant diagram. **(06 Marks)**

Module-4

7 a. Highlight the advantages and disadvantages of OFDM? **(06 Marks)**

b. Explain IP based flat network architecture used in 3GPP evolution. **(06 Marks)**

c. Explain how the data blocks preparation using cyclic prefix are represented in OFDM. **(08 Marks)**

OR

8 a. What are the multi antenna techniques incorporated to combat multipath fading. **(06 Marks)**

b. Explain the concept of OFDM with relevant block diagram. **(07 Marks)**

c. Describe the feature of SC – FDE system. Also compare its performance with OFDM. **(07 Marks)**

Module-5

9 a. Explain with relevant diagram OFDM uplink transmitter/downlink receiver for K users. **(08 Marks)**

b. Compare different OFDMA Rate – Adaptive Resource Allocation scheme. Explain the maximum sum rate algorithm. **(08 Marks)**

c. Explain in brief the design principles of LTE. **(04 Marks)**

OR

10 a. Explain with relevant diagram SC – FDMA uplink receiver. Highlight the advantages and disadvantages associated with the SC-FDMA. **(10 Marks)**

b. Explain the proportional rate constraint algorithm and proportional fairness scheduling. **(10 Marks)**

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