

SPECIAL SUPPLE B.TECH/ECE/7TH SEM/ECEN 4103/2018

**ADVANCED COMMUNICATION SYSTEMS
(ECEN 4103)**

Time Allotted : 3 hrs

Full Marks : 70

Figures out of the right margin indicate full marks.

*Candidates are required to answer Group A and
any 5 (five) from Group B to E, taking at least one from each group.*

Candidates are required to give answer in their own words as far as practicable.

**Group - A
(Multiple Choice Type Questions)**

1. Choose the correct alternative for the following: **10 × 1 = 10**
- (i) MIN stands for
(a) Mobile Identification Number
(b) Mobile Internet
(c) Mobility in Network
(d) None of the above.
- (ii) LTE means
(a) Long Term Evolution
(b) Low Term Evaluation
(c) Link Time Establishment
(d) none of these.
- (iii) The process of transferring a mobile station from one base station to another is called
(a) MSC
(b) activation
(c) hand off
(d) forward channel linking.
- (iv) The interference between the neighbouring base stations is avoided by
(a) assigning different group of channels
(b) using transmitters with different power level
(c) using different antennas
(d) all of the above.
- (v) Free Space Propagation Model is mathematically represented by
(a) Log distance path model
(b) Friis formula
(c) Log normal model
(d) Okumura Hata model.
- (vi) Fading of signals is caused due to
(a) multipath propagation
(b) obstacles
(c) variation of amplitude and phase at receiver
(d) all of these.

- (vii) In a GSM network, the unit that facilitates roaming is called
(a) HLR (b) EIR (c) AuC (d) VLR.
- (viii) The function of GGSN is to
(a) route packets to the current location
(b) reject duplicate packets
(c) provide ACK signals to MSC
(d) none of these.
- (ix) Fixed WiMAX provides
(a) multipoint to multipoint technology
(b) multipoint to point technology
(c) point to multipoint technology
(d) (b) or (c).
- (x) To get the IMEI of any mobile phone, one has to type
(a) *#00# (b) *#99#
(c) *#06# (d) none of these.

Group - B

2. (a) Explain how Frequency reuse scheme is implemented in a cellular system. What are its advantages?
- (b) If 20 MHz of total bandwidth is allocated for duplex channels in a cellular network with a frequency reuse factor of 4 and each simplex channel is of 25KHz bandwidth, calculate (i) the number of available duplex channels and (ii) No of channels per cell.
(4 + 2) + 6 = 12
3. (a) Explain two concepts of capacity enhancement in a cellular network namely (i) cell splitting (ii) cell sectoring
- (b) Explain how handoff mechanism works in a cellular system. What do you understand by (i) Hard handoff & (ii) Soft handoff.
6 + (3 + 3) = 12

Group - C

4. (a) Draw the block diagram of a typical GSM system. Describe the operations of (i) BSC (ii) MSC and (iii) AuC.
- (b) What are the functions of SIM card?
(3 + 6) + 3 = 12

5. (a) Explain the concepts of Large scale and small scale fading with examples.
- (b) Derive an expression for Free space propagation model considering a clear and undisturbed LOS path between the transmitter and receiver.
- 6 + 6 = 12**

Group - D

6. (a) Explain, with the help of a diagram, the GPRS network architecture.
- (b) How are GPRS attach and detach procedure initiated during GPRS mobility management?
- 6 + 6 = 12**
7. (a) What are the differences between FHSS and DSSS? Explain in details.
- (b) What are the full forms of WiMAX and WLAN? Describe the features of an WiMAX system.
- 6 + (2 + 4) = 12**

Group - E

8. (a) What are the basic concept and functionality of a Mobile IP network? Explain in details highlighting MIP V4 and MIPv6.
- (b) Describe briefly the Tunneling and reverse Tunnelling operations in a mobile IP network.
- 6 + 6 = 12**
9. (a) Explain the FHSS and DSSS technologies used for WLAN transmission.
- (b) Draw a schematic diagram of WLAN architecture and explain the functions of AP (access point).
- 6 + (4 + 2) = 12**

