WIRELESS AND CELLULAR COMMUNICATION
(ECEN 3211)

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) In normal handoff procedure, the handoff request is based on
(a) Power level (b) Signal strength
(c) Peak current (d) None of these.

(ii) The concept of MAHO is applicable in
(a) IG analog cellular system (b) base station antennas
(c) 2G cellular system (d) none of these.

(iii) What is the standard indoor pedestrian data rate in 3G wireless network?
(a) 2Mbps (b) 4 Mbps (c) 6 Mbps (d) 8 Mbps.

(iv) Which one is not a mobile station antenna?
(a) Sleeve dipole antenna (b) Omnidirectional antenna
(c) Helical antenna (d) Microstrip printed antenna.

(v) The basic frequency regions for GSM is
(a) 900 MHz (b) 1800 MHz
(c) 1900 MHz (d) All the above.

(vi) A copy of the user's secret key ia kept in the
(a) AuC (b) EIR (c) TRAU (d) OMC.

(vii) In triangular routing how many steps are involved for IP-packet transfer
(a) Four steps (b) Five Steps
(c) Three Steps (d) None of these.

(viii) Because of _____ transmissions in TDMA, the handoff process in ____
(a) Continuous, complex (b) Continuous, simple
(c) Discontinuous, complex (d) Discontinuous, simple.

(ix) Packet Data Convergence protocol is used to transport
(a) point-to-point (b) IPv4
(c) IPv6 protocols (d) all in above.

(x) In GPRS packet data services, mobility is managed by
(a) MSC (b) SGSN (c) GGSN (d) PGSN.

Group – B

2. (a) What is called radio cell? How does a cluster form?

(b) How is frequency reuse concept useful in cellular communication?

(c) What is the different channel allocation schemes used in cellular communications? In which situations each of these schemes are suitable?

(2 + 2) + 4 + 4 = 12

3. (a) Derive Path loss of two-ray ground reflection model.

(b) What is Doppler Effect? How it affects the data communication of a moving MS?

6 + (2 + 4) = 12

Group – C

4. (a) Why uplink frequency is lesser than the downlink frequency in GSM network?

(b) Describe the GSM frame structure.

(c) Explain a call set-up procedure in the GSM network.

2 + 4 + 6 = 12

5. (a) How AuC and EIR checks the mobile subscribers' authenticity?

(b) Draw the GPRS network architecture and explain the importance of SGSN and GGSN.

(c) Define attach detach procedures of GPRS network.

3 + (3 + 4) + 2 = 12

Group – D

6. (a) What are the features of CDMA based IS 95 system? Explain the Forward link of CDMA based IS-95 system.

(b) What is near far problem in CDMA network? How it can be minimized?

(4 + 4) + (2 + 2) = 12

7. (a) What is Universal Mobile Telecom System (UMTS) 99? Explain the functionality of UE and Node B in UMTS network architecture.

(b) Discuss the soft handoff mechanism in CDMA IS-95 networks.

(2 + 7) + 3 = 12

Group – E

8. (a) Explain the principle of operation of a Bluetooth Network.

   (b) Describe the WLAN architecture and it's components.

   (c) What are the difference between MIPV4 and MIPV6?

3 + 6 + 3 = 12

9. (a) What are the four basic entities for MIPV4? How is "Agent Discovery" performed by Mobile IPv4?

   (b) What is reverse tunnelling in IPv4?

(4 + 3) + 5 = 12

Department & Section	Submission Link
ECE Sec A	https://classroom.google.com/u/1/w/Mjk4NjA2MjM5MTMz/tc/MzY0NDQxMzU2NDc0
ECE Sec B	https://classroom.google.com/u/0/w/Mjk4ODcyOTk2Nzg5/tc/MzU3NDA0MjQyODAy
ECE Sec C	https://classroom.google.com/u/0/w/Mjk5MzYzNzk3OTc3/tc/MzY0NTM4ODk1MjIx