

**WIRELESS AND MOBILE COMMUNICATION  
(ECEN 5102)**

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) The process of transferring a mobile station from one base station to another is called
 

(a) handshaking	(b) handoff
(c) roaming	(d) transfer logic.
  - (ii) Handoff controlling is done by
 

(a) PSTN	(b) MTSO	(c) BSC	(d) Cell site.
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  - (iii) The 2G GSM technology uses a carrier separation of
 

(a) 1.25 MHz	(b) 200 kHz
(c) 30 kHz	(d) 300 kHz.
  - (iv) Present day mobile service operators in India offer
 

(a) Voice over LTE	(b) Zero Latency
(c) Streaming video	(d) Firewall.
  - (v) Roaming in a mobile network is supported by
 

(a) AUC	(b) VLR	(c) MS	(d) None of these.
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  - (vi) Frequency reuse strategy is used
 

(a) for limited availability of spectrum	(b) limited geographical area
(c) to employ frequency hopping	(d) all of these.
  - (vii) Co channel interference can be reduced by
 

(a) increasing spacing	(b) increasing power
(c) reducing cell diameter	(d) using more co channel cells.
  - (viii) IEEE 802.11 sets standard for
 

(a) LAN	(b) LAN Security
(c) Bluetooth	(d) PAN.

- (ix) In mobile IP network, users are provided with
 

(a) a mobile id number	(b) personal id no
(c) a fixed number	(d) a "care of" address.
- (x) Which of the following systems is based on a microcell architecture?
 

(a) GSM	(b) DECT	(c) USDC	(d) IS-95.
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**Group – B**

2. (a) Explain why square and circular cell structure is not suitable to arrive at an ideal cell geometry.
- (b) Analyze the method of cell splitting while improving coverage and capacity. What is the purpose of "handoff" in a cellular network? Explain the terms "hard" & "soft" handoff.

**4 + (4 + 4) = 12**

3. (a) 33 MHz bandwidth is allocated to a FDD cellular system which uses two 25 kHz simplex channels to provide full duplex operation. Compute the no. of chls available per cell if a system uses (i) 4 cell reuse (ii) 7 cell reuse (iii) 12 cell reuse.
- (b) What are the salient features of fixed channel and dynamic channel assignment strategy?

**6 + 6 = 12**

**Group – C**

4. (a) With the help of block diagram briefly describe the GSM system architecture.
- (b) Explain how a GSM call is setup when a subscriber calls from mobile to another subscriber in PSTN network.

**6 + 6 = 12**

5. (a) Derive the Free Space Propagation model formula from hypothesis and explain.
- (b) Draw the profile of multipath propagation model and explain.

**6 + 6 = 12**

**Group – D**

6. (a) What are the components of WLAN? Give brief description of each.
- (b) Explain the concept of pico net in a Bluetooth system and explain the master slave concept.

**6 + 6 = 12**

7. (a) Explain the concepts of diffused, quasi diffused and point to point IR WLAN.
- (b) Draw the Bluetooth architecture and explain its working.

**9 + 3 = 12**

**Group – E**

8. (a) Mention the advantages and disadvantages of IR based wireless networks.
- (b) Discuss in brief the configuration of a spread spectrum wireless LAN.

**6 + 6 = 12**

9. (a) Explain the concept of reverse tunneling with a diagram.
- (b) Explain the concept of carrier sense multiple access technique/collision detection.

**6 + 6 = 12**