

**Group - E**

8. (a) What do you understand by the terms “cognitive overlay” and “cognitive underlay”?
- (b) What will be the cipher text of the following plain text if Playfair cipher is used? Consider the keyword to be “GOOD MORNING” and the plain text to be “MY NAME IS PLAYFAIR CIPHER”.
- (c) Explain the Diffie Hellman key exchange algorithm with suitable diagram. Explain its vulnerability towards man-in-the-middle attack.  
**4 + 4 + 4 = 12**
9. (a) Write a short note on firewall.
- (b) Draw and discuss the protocol architecture of WAP.
- (c) Explain the session establishment in WSP/B.  
**4 + 4 + 4 = 12**

**ADVANCED MOBILE COMPUTING  
(CSEN 5224)****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) State whether True or False.  
 (x) The cells or subdivisions of a geographical area are always hexagonal.  
 (y) A land to mobile call originates through the telephone exchange.  
 (a) True, False (b) False, True  
 (c) False, False (d) True, True
- (ii) State whether True or False.  
 (x) In GSM only TDMA is used.  
 (y) There is zero inter-channel interference in CDMA.  
 (a) True, False (b) False, True  
 (c) False, False (d) True, True
- (iii) Match the following standards:  
 (x) Bluetooth (α) IEEE 802.3  
 (y) WLAN (β) IEEE 802.11  
 (z) Ethernet (γ) IEEE 802.15  
 (a)  $x - \alpha, y - \beta, z - \gamma$  (b)  $x - \gamma, y - \beta, z - \alpha$   
 (c)  $x - \beta, y - \gamma, z - \alpha$  (c) none of these
- (iv) \_\_\_\_\_ handoff is possible in CDMA systems whereas \_\_\_\_\_ handoff is possible in GSM.  
 (a) Soft,hard (b) Hard,soft  
 (c) Soft,soft (d) Hard,hard.

- (v) In asymmetric key cryptography, the private key is kept by  
 (a) sender  
 (b) receiver  
 (c) sender and receiver  
 (d) all the connected devices in the network.
- (vi) Which of the following is a GSM channel?  
 (a) Traffic (b) Broadcast  
 (c) Control (d) All the above.
- (vii) Which one of the following event is not possible in wireless LAN?  
 (a) Collision detection  
 (b) Acknowledgement of data frames  
 (c) Multi-mode data transmission  
 (d) None of the mentioned.
- (viii) In Mobile Assisted Handoff (MAHO), the handoff takes place when  
 (a) The power received by the mobile station from other base station is more than the serving base station  
 (b) The channel allocated is not available  
 (c) The mobile station has no signal  
 (d) All of the above.
- (ix) Macro, Micro, Pico, Femto and Umbrella are all types of what?  
 (a) Uplink and downlink channels  
 (b) GSM filters  
 (c) Cell sizes in a GSM network  
 (d) GSM interfaces
- (x) Which of the following is not true for M-TCP?  
 (a) It splits the TCP connection into two parts at the access point.  
 (b) It does not perform any buffering at the access point  
 (c) It retransmits data at the access point  
 (d) None of the above

**Group - B**

2. (a) Draw the architecture diagram of a cellular system. Explain the functions of its various components, viz., BTS, MSC, BSC, etc.  
 (b) Explain the MAHO concept.  
 (c) How does frequency reuse help channel allocation of cellular systems?

**(3 + 3) + 3 + 3 = 12**

3. (a) What are the functions of authentication and encryption in GSM?  
 (b) What is handover? Explain the different kinds of handover that you know of.

**5 + (3 + 4) = 12****Group - C**

4. (a) Explain the hidden terminal and exposed terminal problems in a WLAN system.  
 (b) How does the CSMA/CA protocol work? In particular, show the working of this protocol with respect to various interframe spacing times.  
 (c) How does RTS/CTS based mechanism handle hidden station problem?
5. (a) What are piconet and scatternet?  
 (b) What is the role played by the baseband layer in forming piconet?  
 (c) Explain formation of SCO and ACL links and also how the FH-TDD scheme works in this context, using suitable diagrams.

**3 + (2 + 4) + 3 = 12****3 + 3 + 3 + 3 = 12****Group - D**

6. (a) What are the three main steps needed to handle mobile IP based networking?  
 (b) Explain with a diagram what happens to source and destination address fields of an IP packet undergoing encapsulation and decapsulation stages.  
 (c) State the routing challenges of MANET.  
 (d) What is the difference between DSDV and AODV?
7. (a) Explain triangular routing with suitable diagram.  
 (b) Compare and contrast S-TCP and M-TCP.  
 (c) What is the count-to-infinity problem? How can we solve it?

**3 + 3 + 3 + 3 = 12****4 + 4 + 4 = 12**