

**M.TECH/ECE/2<sup>ND</sup> SEM /ECEN 5203/2016**

- (v) Location update procedure is initiated by  
(a) MS (b) BTS  
(c) NSS (d) BSC
- (vi) Bluetooth can support upto ..... nodes  
(a) 49 (b) 69 (c) 29 (d) 79
- (vii) Shadowing model is more realistic in:  
(a) rural areas (b) urban areas  
(c) long distances (d) none of these
- (viii) Diversity techniques improves  
(a) S/N (b) Inter symbol interference  
(c) fading channel performance (d) Doppler shift.
- (ix) IEEE 802.11 describes the  
(a) MAC layer (b) network layer  
(c) physical and data link layers (d) none of these
- (x) The receiver performance can be improved by:  
(a) increasing transmit power level  
(b) increasing transmitter antenna height  
(c) increasing receiver antenna height  
(d) any of these

**Group - B**

2. (a) What are the different categories of wireless networks the basis of on coverage area? Describe the working principle of a low tier system of domestic application.  
(b) What do you understand by UMTS and what are its basic functions? What is the name given to the first version of UMTS based on WCDMA?  
**(4 + 4) + (3 + 1) = 12**
3. (a) Why was 1G technology called hybrid technology? What is co-channel interference? Describe with explanation two methods to reduce this problem.  
(b) Prove that a cluster dimension of 7 cells is required for a C/I of 18dB.  
**6 + 6 = 12**

**M.TECH/ECE/2<sup>ND</sup> SEM /ECEN 5203/2016**

**Group - C**

4. (a) The frame number requires 28 bits for its representation in GSM system whereas RFN has brought it down to 19 bits. Show this translation.  
(b) A GSM system has 3 start bits, 3 stop bits, 26 TS bits, 8.25 guard bits and 2 bursts of 58 bits of data bits. The transmission speed is 270.833 Kbps. Find the frame efficiency.  
**6 + 6 = 12**
5. (a) With a block diagram, explain the function of RSS (Radio Subsystem) in GSM Network. What are IMEI & N TMSI?  
(b) What are the uplink and downlink frequency band of GSM 900? Show, how 31 channels are organized in the band.  
**(4+2) + (2+4) = 12**

**Group - D**

6. (a) What is cross-over distance? Find out the expression for cross-over distance using Friis' equation and two-ray model. Why are some RF propagation models suitable for urban areas and some models are suitable for rural areas?  
(b) Assume a receiver is located at 10 Kms from a 5 W transmitter. The carrier frequency is 1800 MHz and free space propagation is applied. Determine (i) the power at the receiver, (ii) the magnitude of the E-field at receiver antenna, (iii) the rms voltage applied to the receiver input. Consider the receiver antenna to be purely resistive with an impedance of 50 ohms and to be matched to the receiver circuit. ( $G_t = 2$  and  $G_r = 2$ ).  
**(2 + 3 + 2) + 5 = 12**
7. (a) What are the different propagation effects in a RF link? Explain.  
(b) Explain the different multipath phenomena that can happen to a radio wave during its travel from transmitter to receiver?  
**6 + 6 = 12**

Group - E

8. (a) Why are Ad Hoc networks called so? Compare reactive and pro-active routings. How are route establishment and route discovery performed in DSDV protocol?  
(b) Describe some approaches to reduce power consumption in Ad Hoc network nodes.  
 $(2 + 2 + 4) + 4 = 12$
9. (a) In the process of transferring datagrams by the home agent to care of address in MIP network, explain the process of tunnelling and reverse tunnelling.  
(b) Explain what is meant by Dynamic Source Routing.  
 $(4+4) + 4 = 12$

MOBILE COMMUNICATION  
(ECEN 5203)

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 alternatives for the following:  $10 \times 1=10$
- (i) Which of these is not true for TDD?  
(a) TDD uses different time slots for transmission and reception paths  
(b) Single radio frequency can be used  
(c) Duplexer is required  
(d) It increases the battery life of mobile phones
- (ii) Rake receivers are designed to nullify  
(a) frequency shift (b) amplitude variation  
(c) time delay (d) code corruption
- (iii) The technique adopted to increase the system capacity and reduce co-chl interference is  
(a) high power BTS  
(b) by installing the Omni directional antenna  
(c) sectorisation  
(d) none of the above
- (iv) For CDMA cellular systems, the chip codes are not repeated in a  
(a) cell (b) cluster  
(c) total coverage area (d) none of these