

**FACULTY OF ENGINEERING**  
**B.E. 4/4 (ECE) I-Semester (Old) Examination, July 2014**

**Subject : Mobile Cellular Communication**

**Time : 3 Hours**

**Max. Marks: 75**

**Note: Answer all questions of Part - A and answer any five questions from Part-B.**

**PART – A (25 Marks)**

- 1 List out the functions of MSC. (3)
- 2 Distinguish between paging and mobile systems. (2)
- 3 What is trunking and GOS? (3)
- 4 A FDD cellular system has a total bandwidth of 50MHz. Assuming forward and reverse channel bandwidth of each equal to 50 kHz, determine the number of available channel per cell if the system uses  $N = 4$ . (2)
- 5 Calculate the Brewster angle for a wave impinging on ground having a permittivity of  $\epsilon_r = 4$ . (2)
- 6 Mention three small scale fading effects of multipath in the radio channel. (3)
- 7 What is self Jamming in CDMA? (2)
- 8 State the advantages of umbrella cell approach. (3)
- 9 If a normal GSM time slot consists of 6 training bits, 8.25 guard bits, 26 training bits and 2 traffic bursts of 58 bits of data, find the frame efficiency. (3)
- 10 Explain the significance of SAT and ST in AMPs. (2)

**PART – B (50 Marks)**

- 11 (a) How a call is established from land line to mobile phone? Explain with the help of timing diagram. (6)  
 (b) Explain blue tooth and personal area network. (4)
- 12 Discuss the "hand-off" strategies employed in the design of a mobile communication system. (10)
- 13 Explain time dispersion and frequency dispersion parameters of a mobile multipath channel. How do you classify mobile channels based on these parameters? (10)
- 14 (a) What is small scale fading? What are the factors influence small scale fading? (5)  
 (b) How does slotted ALOHA improve throughput as compared with pure ALOHA? (5)
- 15 (a) Compare FDMA, TDMA and CDMA. (7)  
 (b) What is the need for power control in CDMA based system? (3)
- 16 (a) Explain forward channel architecture of a IS-95 with a neat sketch. (7)  
 (b) Discuss the services offered by GSM. (3)
- 17 (a) Discuss about the channel assignment strategies. (5)  
 (b) Explain the cellular system architecture in detail. (5)

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**FACULTY OF ENGINEERING**

**B.E. 4/4 (ECE) I-Semester (New) (Suppl.) Examination, July 2014**

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**Time : 3 Hours**

**Max. Marks: 75**

**Note: Answer all questions of Part - A and answer any five questions from Part-B.**

**PART – A (25 Marks)**

- 1 If SIR of 15dB is required, find frequency reuse factor and cluster size for maximum capacity when  $n = 4$ .
- 2 Define Grade of service.
- 3 Write the assumptions made in developing free space propagation model and two ray ground reflection model.
- 4 Discuss the effect of transmission band width of the signal as small scale fading.
- 5 Find frame efficiency for a normal GSM time slot connecting of 6 trail bits, 8.25 guard bits, 26 training bits and two traffic bursts of 58 bits to data, find the frame efficiency.
- 6 Specify multiple access techniques for different traffic types.
- 7 Draw GSM frame structure.
- 8 Draw block diagram of forward CDMA channel modulation process.
- 9 Compare characteristics of 1G and 2G.
- 10 Write features of Blue tooth.

**PART – B (50 Marks)**

- 11 (a) Explain sectoring and micro cell zone concepts for improving coverage and capacity in cellular system.  
(b) For a  $N = 7$  system with  $Pr[\text{Blocking}] = 1\%$  and average call length of 2min, find the traffic capacity loss due to trunking for 57 channels when going from omni directional antennas to 60 sectored antennas (assume that Blocked calls are cleared and the average per user call rate is  $\lambda = 1$  per hour).
- 12 (a) Explain log distance path loss model in detail.  
(b) Define Doppler spread and coherence time.
- 13 (a) Differentiate between FDMA, TDMA and CDMA techniques.  
(b) Explain ALOHA and slotted ALOHA systems.
- 14 (a) Explain in detail signal processing in GSM.  
(b) Explain reuse IS-95 channel modulation process for a single user.
- 15 (a) Write features of 3G and 4G techniques.  
(b) Explain briefly about 3G W-CDMA.
- 16 (a) Explain Durbin's in detail.  
(b) Explain CSMA protocol.
- 17 Write short notes on the following:  
(a) Handoff process (b) WLAN

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