Hall Ticket No | | | | | | | | | | | Question Paper Code: AEC520

INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

B.Tech VI Semester End Examinations (Regular) - May, 2019

Regulation: IARE – R16

CELLULAR AND MOBILE COMMUNICATIONS

Time: 3 Hours **(ECE)** **Max Marks: 70**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the question must be answered in one place only

UNIT – I

1. (a) Categorize the parameters that specify the performance criteria of cellular system with explanation. **[7M]**

   (b) Consider maximum number of calls in one hour in one cell is 3500 and an average calling time t is 1.76 minutes. Calculate the offered load in the cell. **[7M]**

2. (a) List the 6 uniqueness of mobile radio environment and explain in detail. Explain the concept of frequency reuse in cellular system. **[7M]**

   (b) Consider a metropolitan area of 1100 square km is to be covered by cells with cell radius of 2 km. Calculate the number of cells that would be needed. **[7M]**

UNIT – II

3. (a) Discuss the "Lee model" for point to point propagation in cellular mobile communication system. **[7M]**

   (b) Explain the designing of the omni-directional antenna under the practical case conditions for k =7, k =12 and k= 19 with all the suitable values and explaining each of them. **[7M]**

4. (a) Explain the effect of propagation of mobile signals over water. **[7M]**

   (b) A base station receiver capable of providing 80 dB of isolation between channels is receiving a signal from mobile unit 2 km away. What is the minimum distance that a second mobile unit can transmit the signal from the near end mobile unit. **[7M]**

UNIT – III

5. (a) Explain briefly the antenna sum and difference patterns. **[7M]**

   (b) Develop a frequency management chart in 1G systems for duo poly market with K=7 & 3 sector with minimal interference. **[7M]**

6. (a) Deduce the blocking probability of handoff calls and the blocking probability of originating calls. **[7M]**

   (b) What is the need for frequency reuse? Explain the frequency reuse concept and show that N=i_2+ij+j_2 Where N is the number of cells per cluster. **[7M]**

UNIT – IV

7. (a) What is the role of WLL technology and mention some of its key advantages over a wired subscriber loop. **[7M]**

   (b) What do you understand by non-fixed channels assignment? Describe the corresponding algorithms. **[7M]**

8. (a) What are the security services provided by Bluetooth? Explain in detail. **[7M]**

   (b) If a transmitter produces 50W of power express the transmitter power in units of dBm and dBW. **[7M]**

UNIT – V

9. (a) Write short notes on Future Public Land Mobile Telecommunication System. **[7M]**

   (b) What type of handoff is used when a call initiated in one cellular system enters another system before terminating? Explain how it works? **[7M]**

10. (a) Explain ATM technology for cellular and mobile communications. **[7M]**

    (b) Explain the concept of intelligent cell in detail and list out the advantages. **[7M]**

– ○ ○ ◯ ○ ○ –