Reg.No. \_\_\_\_\_\_\_\_\_\_\_\_



**End Semester Examination – Nov/Dec – 2018**

|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  |  |
| **Code :** | **18EC3003** | **Duration :** | **3hrs** |
| **Sub. Name :** | **WIRELESS AND MOBILE COMMUNICATION** | **Max. marks :** | **100** |

**ANSWER ANY FIVE QUESTIONS (5 x 16 = 80 Marks)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Q. No.** | **Sub Div.** | **Questions** | **Course**  **Outcome** | **Marks** |
| 1. | a. | With suitable diagrams, explain the different handoff strategies used in cellular system. Also, mention the types of handoff happenings in GSM system. | CO2 | 12 |
| b. | Elaborate about various techniques used to expand the capacity of cellular systems. | CO2 | 4 |
|  |  |  |  |  |
| 2. | a. | Describe CDMA multiple access technique and its features with necessary diagrams. | CO3 | 12 |
| b. | If GSM uses a frame structure where each frame consists of eight time slots, and each time slot contains 156.25 bits, and data is transmitted at 270.833kbps in the channel, find (i) the time duration of a bit, (ii) the time duration of a slot, (iii) the time duration of a frame, and (iv) how long must a user occupying a single time slot wait between two successive transmissions. | CO3 | 4 |
|  |  |  |  |  |
| 3. | a. | Analyze the factors that influence small-scale fading. List different types of small-scale fading and explain each one in detail. | CO4 | 12 |
| b. | The transmission power of a cellular communication system operating at 900MHz is 40W. Assume free-space propagation conditions and unity gain omni-directional antennas at both cell-site transmitter and mobile receiver. i) Express the transmitter power in units of dBm. ii) How much power is received by a mobile unit at a distance of 1km and 100m. | CO4 | 4 |
|  |  |  |  |  |
| 4. | a. | Categorize diversity techniques used in communication receivers and explain each in detail. | CO1 | 12 |
| b. | Illustrate the structure of a linear transversal equalizer. | CO1 | 4 |
|  |  |  |  |  |
| 5. | a. | Mention different classification of logical channels in IS-95 CDMA. Explain each channel processing mechanisms. | CO5 | 12 |
| b. | Show the evolution of IS-95 to cdma-2000. | CO5 | 4 |
|  |  |  |  |  |
| 6. | a. | Illustrate Fresnel zones for different knife-edge scenarios. | CO4 | 8 |
| b. | Model Friis free space equation used in free space propagation. | CO4 | 8 |
|  |  |  |  |  |
| 7. | a. | Raju is travelling from Coimbatore to Chennai in a car, talking to his friend with his mobile phone. Mention the process and the measures the cellular system has to undertake to ensure his call without any call drop during his travel. | CO2 | 8 |
| b. | List the different subsystems in GSM and with neat diagrams, explain the working of each subsystem. | CO1 | 8 |
|  | | | | |
| **COMPULSORY QUESTION (1 x 20 = 20 Marks)** | | | | |
| 8. | a. | Tell about the enhancements in 4G standard and explain the call flow process and protocols used in LTE. | CO6 | 14 |
| b. | Compare and contrast 3G, 4G and 5G systems. | CO6 | 6 |