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



**UNIVERSITY**

(Karunya Institute of Technology & Sciences)

(Declared as Deemed-to-be University under Sec.3 of the UGC Act, 1956)

**End Semester Examination – April/May– 2017**

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| **Code :** | **14EC2038** | **Duration :** | **3hrs** |
| **Sub. Name :** | **CELLULAR MOBILE COMMUNICATION** | **Max. marks :** | **100** |

**ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)**

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| Q. No. | Sub Div. | Questions | Course  Outcome | Marks |
| 1. | a. | In what way radio propagation on land different from that in free space? Explain about the signal propagation effect and free space path loss of radio signals. | CO2 | 14 |
| 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. (a) Express the transmitter power in units of dBm. (b) How much power is received by a mobile unit at a distance of 1Km. | CO2 | 6 |
| (OR) | | | | |
| 2. | a. | Define Multiplexing. Explain in detail about different types of multiplexing. | CO1 | 13 |
| b. | Write short notes on different digital modulation techniques used in communication. | CO1 | 7 |
| 3. | a. | Explain the concept of frequency reuse applied to Cellular Communications with neat diagrams. | CO2 | 13 |
|  | b. | Compare and contast different mobile communication technologies. | CO2 | 7 |
| (OR) | | | | |
| 4. | a. | Describe CDMA multiple access technique and its features with necessary diagrams. | CO1 | 14 |
|  | b. | A cellular system with 25MHz total bandwidth is allocated for duplex communication. Each simplex channel is 30KHz. The frequency reuse factor for the system is seven. Find (a) total number of duplex channels (b) total number of channels per cell. | CO3 | 6 |
| 5. | a. | Sketch the functional block diagram of the GSM system and explain its each block working. | CO2 | 15 |
|  | b. | Write short notes on different types of interference related to system capacity. | CO1 | 5 |
| (OR) | | | | |
| 6. | a. | Elucidate the different hand off strategies used in cellular communication. | CO2 | 10 |
|  | b. | Consider a metropolitan city with total area of 2000Km2 is covered by 22 hexagonal cell. The radius of each cell is 6.5 Km. The cellular system has been allocated total bandwidth of 30MHz and full duplex channel of 30KHz, total 35KHz guard band is used as in FDMA system, there are total 15 control channels. Determine (a) the number of channels without frequency reuse. (b) cell capacity for N=7. (c) If the frequency reuse factor N=7 for hexagonal cell structure having equal coverage area, find the distance between two nearest co-channel cells. (d) Considering path loss exponent n=4 and first-tier interfering cells only, find the minimum signal to interference ratio to be maintained for the system with N=7 . | CO3 | 10 |
| 7. | a. | Discuss the concept of handover in connection with the satellite communication system. | CO3 | 6 |
|  | b. | Give an example of a generic WATM reference model and explain its each block. Also list different WATM services. | CO3 | 14 |
| (OR) | | | | |
| 8. | a. | List the difference between DAB and DVB in terms of bandwidth, mobility support, coverage and cost. | CO2 | 6 |
|  | b. | Mention the functioning of Digital Audio Broadcasting with neat diagrams. | CO2 | 14 |
|  | | **Compulsory**: |  |  |
| 9. | a. | Illustrate the functioning of Destination Sequenced Distance Vector (DSDV) in Mobile Adhoc Network. | CO3 | 14 |
|  | b. | Write short notes on geographic position assisted adhoc routing. | CO3 | 6 |

ALL THE BEST