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**UNIVERSITY**

(Karunya Institute of Technology & Sciences)

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

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

**End Semester Examination – Nov/Dec - 2016**

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|  |  | **Semester :** | **2016-17 ODD** |
| **Code :** | **14EC2044** | **Duration :** | **3 hrs** |
| **Sub. Name :** | **Fundamentals of Wireless Communication** | **Max. marks :** | **100** |

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| Q. No. | Questions | Marks |
| PART-A(10X1=10 MARKS) | | |
| 1. | What is Bluetooth? | (1) |
| 2. | Geostationary satellites are placed at an altitude of \_\_\_\_\_\_\_\_\_. | (1) |
| 3. | What is time division multiple access? | (1) |
| 4. | Define capacity of cellular systems. | (1) |
| 5. | What is adjacent channel interference? | (1) |
| 6. | What is handoff? | (1) |
| 7. | What is a propagation model? | (1) |
| 8. | Define coherence bandwidth. | (1) |
| 9. | What is flat fading? | (1) |
| 10. | Define Doppler shift. | (1) |

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| **PART B(5 X 3= 15 MARKS)** | | |
| 11. | What are the challenges in wireless networking? | (3) |
| 12. | There are ten users, each occupying a bandwidth of 4 kHz. If a guardband of 1 kHz is to be assigned. Determine the total bandwidth of these ten users. | (3) |
| 13. | Explain the near-far effect. | (3) |
| 14. | Find the average fade duration for threshold level ρ = 0.01, when the Doppler frequency is 200 Hz. | (3) |
| 15. | Derive an expression for simplified path loss model. | (3) |

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| **PART C(5 X 15= 75 MARKS)** | | | | |
| 16. | |  | Explain in detail about satellite networks. | (15) |
| (OR) | | | | |
| 17. | |  | Discuss on the recent advancements in wireless communication. | (15) |
| 18. | |  | Discuss different techniques used for improving coverage and capacity in cellular systems. | (15) |
| (OR) | | | | |
| 19. | | a. | If a total of 33 MHz of bandwidth is allocated to a particular FDD cellular telephone system which uses two 25 kHz simplex channels to provide full duplex voice and control channels, compute the number of channels available per cell if a system uses (a) 4-cell reuse, (b) 7-cell reuse. | (5) |
| b. | If a signal to interference ratio of 15 dB is required for satisfactory forward channel performance of a cellular system, what is the frequency reuse factor and cluster size that should be used for maximum capacity if the path loss exponent is a) n= 4, b) n=3? Assume that there are 6 co-channels cells in the first tier and all of them are at the same distance from the mobile. Use suitable approximations. | (10) |
| 20. | |  | With neat diagrams, explain the Free Space Propagation Model. | (15) |
| (OR) | | | | |
| 21. |  | | Derive the signal model that takes into account both the LOS path and the reflected path. | (15) |
| 22. |  | | Derive the Impulse response model of a Multipath channel. | (15) |
| (OR) | | | | |
| 23. |  | | Compare and contrast wideband and narrowband fading channels. | (15) |
| 24. |  | | Discuss on the capacity offered by an AWGN channel in detail. | (15) |
| (OR) | | | | |
| 25. |  | | Compare and contrast flat-fading and frequency selective fading channels. | (15) |

ALL THE BEST