**18EC702**

**Hall Ticket Number:**

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| **IV/IV B.Tech (Supplementary) DEGREE EXAMINATION** | | | |
| **April,2023** | **Electronics & Communication Engineering** | | |
| **Seventh Semester** | **Wireless And Mobile Communications** | | |
| **Time:** Three Hours | | **Maximum: 5**0 Marks | |
| *Answer Question No. 1 Compulsorily.* | | | (10X1 = 10 Marks) |
| *Answer* ***ANY ONE*** *question from each Unit.* | | | (4X10=40 Marks) |

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| 1. | a) | Why frequency reuse gained importance in cellular concept? | CO1(BL1) | |  |
|  | b) | What is adjacent channel interference? How it can be minimized?. | CO1(BL1) | |  |
|  | c) | Discuss the need for handoff. | CO1(BL1) | |  |
|  | d) | Relate Coherence Time and Doppler Spread. | CO2(BL1) | |  |
|  | e) | List the three basic propagation mechanisms. | CO2(BL1) | |  |
|  | f) | Compare large scale fading and small scale fading. | CO2(BL1) | |  |
|  | g) | Compare linear and nonlinear equalizers. | CO3(BL1) | |  |
|  | h) | Differentiate Maximal ratio combining (MRC) and equal gain combining. | CO3(BL1) | |  |
|  | i) | What are the main technologies used in Second Generation Networks (2G)? | CO4(BL1) | |  |
|  | j) | Which multiplexing technique is used in 4G? | CO4(BL1) | |  |
| **Unit - I** | | | | | |
| 2. | a) | Derive the relation between the radius of a cell(R), the cluster size (N) and the distance between the co channel cell centers (D). | CO1(BL1) | **5M** | |
|  | 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. | CO1(BL1) | **5M** | |
|  |  | **(OR)** |  |  | |
| 3. | a) | Explain the various techniques used to enhance the capacity of cellular systems. | CO1(BL1) | **5M** | |
|  | b) | Why handoff is necessary for cellular systems? Illustrate a proper handoff scenario at cell boundary. | CO1(BL1) | **5M** | |
| **Unit - II** | | | | | |
| 4. | a) | Classify small scale fading and explain small scale fading based on multipath time delay spread and explain. | CO2(BL1) | **5M** | |
|  | b) | Calculate the mean excess delay, rms delay spread, and the maximum excess delay (10 dB) for the multipath profile given in the figure below. Estimate the 50% coherence bandwidth of the channel Would this channel be suitable for AMPS or GSM service without the use of an equalizer? | CO2(BL2) | **5M** | |
|  |  | **(OR)**  **P.T.O**  **18EC702** | | | |
| 5. | a) | Illustrate two ray ground reflection model and derive path differences. | CO2(BL1) | **5M** | |
|  | b) | Discuss in detail about path loss and received power using free space propagation model. | CO2(BL1) | **5M** | |

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| **Unit - III** | | | | |
| 6. | a) | Why equalizer is important in receivers and show that equalizers response is inverse of channel response. | CO3(BL1) | **5M** |
|  | b) | In which scenario nonlinear equalizers are preferred over linear equalizer and explain Decision Feedback Equalizer. | CO3(BL1) | **5M** |
|  |  | **(OR)** |  |  |
| 7. | a) | Explain the RAKE receiver with a neat sketch. | CO3(BL1) | **5M** |
|  | b) | Classify Space diversity reception methods and explain any two of them. | CO3(BL1) | **5M** |
| **Unit - IV** | | | | |
| 8. | a) | Compare 1G, 2G, 3G and 4G Mobile Technologies | CO4(BL2) | **5M** |
|  | b) | Explain the architecture of GSM/GPRS with neat diagrams | CO4(BL1) | **5M** |
|  |  | **(OR)** |  |  |
| 9. | a) | Discuss in detail about LTE Network architecture | CO4(BL1) | **5M** |
|  | b) | List and explain 3G Standards and Access Technologies | CO4(BL1) | **5M** |

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