**18EC702**

**Hall Ticket Number:**

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| **IV/IV B.Tech (Regular) DEGREE EXAMINATION** | | | |
| **December, 2021** | **Electronics & Communication Engineering** | | |
| **Seventh Semester** | **Wireless and Mobile Communications** | | |
| **Time:** Three Hours | | **Maximum: 5**0 Marks | |
| *Answer Question No. 1 Compulsorily.* | | | (1X10 = 10 Marks) |
| *Answer* ***ONE*** *question from each Unit.* | | | (4X10=40 Marks) |

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|  |  | | 10X1 = 10 Marks | | | |
| 1. | a) | Give any two examples of wireless communication systems | | CO1 | |  |
|  | b) | What is handoff in mobile communication? | | CO1 | |  |
|  | c) | Define Frequency reuse. | | CO1 | |  |
|  | d) | What are the main reasons for path losses? | | CO2 | |  |
|  | e) | What is Doppler spread | | CO2 | |  |
|  | f) | Write different types of small scale fadings. | | CO2 | |  |
|  | g) | What is diversity? | | CO3 | |  |
|  | h) | What is the nonlinear equalization methods used? | | CO3 | |  |
|  | i) | Compare 1G and 2G | | CO4 | |  |
|  | j) | Provide the abbreviation of HSPA+. | | CO4 | |  |
| **Unit - I** | | | | | | |
| 2. | a) | Discuss the brief different types of hand off strategies. | | CO1 | **5M** | |
|  | b) | Discuss the different techniques that are used for improving coverage and capacity in cellular systems | | CO1 | **5M** | |
|  |  | **(OR)** | |  |  | |
| 3. | a) | Illustrate the frequency reuse concept in cellular systems. | | CO1 | **5M** | |
|  | b) | Explain different types of channel assignment approaches. | | CO1 | **5M** | |
| **Unit - II** | | | | | | |
| 4. | a) | Explain the free space propagation model? | | CO2 | **5M** | |
|  | b) | A transmitter has a power output of 150 watt at a carrier frequency of 32.5MHz. It is connected to an antenna with gain of 12 dBi. The receiving antenna is 10 km away and has gain of 5 dBi. There is Negligible losses or mismatched. Calculate the power delivered to the receiver, assuming free space propagation. | | CO2 | **5M** | |
|  |  | **(OR)** | |  |  | |
| 5. | a) | Derive the equation of the path loss using Two-Ray Model with a neat diagrams | | CO2 | **5M** | |
|  | b) | Explain the fading effects due to Doppler spread. | | CO2 | **5M** | |
| **Unit - III** | | | | | | |
| 6. | a) | Explain decision feedback equalizer with a neat sketch | | CO3 | **5M** | |
|  | b) | Explain the different type of diversity technique used in wireless communication system. | | CO3 | **5M** | |
|  |  | **(OR)** | |  |  | |
| 7. | a) | Briefly explain frequency diversity technique | | CO3 | **5M** | |
|  | b) | Explain the working of RAKE receiver with neat sketches. | | CO3 | **5M** | |
| **Unit - IV** | | | | | | |
| 8. | a) | Explain the architecture of GSM with neat diagrams. | | CO4 | **5M** | |
|  | b) | Discuss the key enabling technologies of LTE. | | CO4 | **5M** | |
|  |  | **(OR)** | |  |  | |
| 9. | a) | Write a short notes on WiMAX | | CO4 | **5M** | |
|  | b) | With a neat block diagram, explain the LTE network architecture and describe briefly the new elements provided in it. | | CO4 | **5M** | |

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**SCHEME**

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| 1. | a) | Give any two examples of wireless communication systems  **Any two examples** |
|  | b) | What is borrowing strategy in channel assignment?  **Explanation** |
|  | c) | Define Frequency reuse.  **Definition** |
|  | d) | What are the main reasons for path losses?  **Any 2 reasons** |
|  | e) | What is Doppler spread  **Definition** |
|  | f) | What is free space propagation model?  **Definition** |
|  | g) | What is diversity?  **Definition** |
|  | h) | What are the nonlinear equalization methods used?  **Methods** |
|  | i) | Compare 1G and 2G  **Any two** |
|  | j) | Provide the abbreviation of HSPA+  **abbreviation** |

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| 2. | a) | Discuss the brief different types of hand off strategies.  **Listing of Types-1M Explanation-4M** |
|  | b) | Discuss the different techniques that are used for improving coverage and capacity in cellular systems  **Listing of techniques-1M Explanation-4M** |
|  |  | **(OR)** |
| 3. | a) | Describe the methodology of trunking and grade of service  **Trunking-2M grade of service-3M** |
|  | b) | What are the different types of channel assignment approaches?Explain the channel assignment approach that can be effectively deployed to handle increased traffic situation.  **Types-1M Explanation-4M** |
| **Unit - II** | | |
| 4. | a) | Explain the free space propagation model?  **Explanation-3M Diagram -2M** |
|  | b) | A transmitter has a power output of 150 watt at a carrier frequency of 32.5MHz. It is connected to an antenna with gain of 12 dBi. The receiving antenna is 10 km away and has gain of 5 dBi. There is Negligible losses or mismatched. Calculate the power delivered to the receiver, assuming free space propagation.  **Solution -5M** |
|  |  | **(OR)** |
| 5. | a) | Derive the equation of the path loss using Two-Ray Model with a neat diagrams  **Derivation -5M** |
|  |  | Discuss in detail about Ground reflection model  **Explanation-3M Diagram -2M** |
| **Unit - III** | | |
| 6. | a) | Explain decision feedback equalizer with a neat sketch  **Explanation-3M Diagram -2M** |
|  | b) | Explain the different type of diversity technique used in wireless communication system.  **Types-1M Explanation-4M** |
|  |  | **(OR)** |
| 7. | a) | Breifly explain frequency diversity technique  **Explanation-3M Diagram -2M** |
|  | b) | Derive the expression for Maximal ratio Combining techniques?Explain  **Derivation -3M Explanation-2M** |
| **Unit - IV** | | |
| 8. | a) | Discuss in Detail about Cellular Technologies and Development  **Explanation-5M** |
|  | b) | Discuss the key enabling technologies of LTE.  **Explanation-5M** |
|  |  | **(OR)** |
| 9. | a) | Write a short notes on WiMAX  **Explanation-3M Diagram -2M** |
|  | b) | With a neat block diagram, explain the LTE network architecture and describe briefly the new elements provided in it.  **Explanation-3M Diagram -2M** |