

Code No: **R194204A**

**R19**

**Set No. 1**

**IV B.Tech II Semester Regular Examinations, April – 2023**

**WIRELESS COMMUNICATION**

**(Electronics and Communication Engineering)**

**Time: 3 hours**

**Max. Marks: 75**

*Answer any FIVE Questions  
ONE Question from Each unit  
All Questions Carry Equal Marks*

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**UNIT I**

- 1 a) List out different Standards of 4G Wireless communication along with examples [7]  
b) What is Fading? Explain its importance [8]  
(OR)
- 2 a) Explain the different Principles of Wireless communications in detail [7]  
b) List out different application of 3G wireless communications [8]

**UNIT II**

- 3 Explain the concept of Spreading Codes based on Pseudo-Noise Sequences along with example [15]  
(OR)
- 4 a) Draw the block diagram of CDMA architecture and explain the function of each block in detail [7]  
b) List out comparisons of CDMA, FDMA and TDMA [8]

**UNIT III**

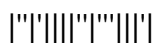
- 5 a) Explain the importance of MIMO in wireless communication in present generation [7]  
b) List out different advantages and disadvantages of MIMO [8]  
(OR)
- 6 Explain the following terms related to MIMO in detail [7]  
(i) Spatial diversity (ii) Spatial multiplexing [8]

**UNIT IV**

- 7 a) Explain the concept of Bit-Error Rate for OFDM along with one example [7]  
b) Explain the importance of OFDM over CDMA [8]  
(OR)
- 8 Explain the following terms in detail (i) MIMO-OFDM [7]  
(ii) SC-FDMA [8]

**UNIT V**

- 9 a) Explain the concept of Geostationary Satellites in detail [7]  
b) List out different applications of Satellites [8]  
(OR)
- 10 Explain the concept of Systems Using Low-Earth-Orbit Satellites along with block diagram [15]



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**Max. Marks: 75**

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ONE Question from Each unit  
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**UNIT I**

- 1 a) Explain the concept of System Model for Narrowband Signals of wireless communication in detail [7]  
b) List out different 2G Wireless Standards in detail [8]  
(OR)  
2 Write short notes on following terms (i) SNR in a Wireless System [7]  
(ii) BER in Wireless Communication System [8]

**UNIT II**

- 3 a) List out different Correlation Properties of Random CDMA and explain each one in detail [7]  
b) List out different advantages of CDMA over GSM [8]  
(OR)  
4 a) What are the different CDMA Mechanisms and explain each one in detail [9]  
b) List out few compressions of CDMA and FDMA [6]

**UNIT III**

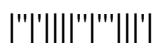
- 5 List out different diversity modes in MIMO system and explain each one in detail [15]  
(OR)  
6 Draw the block diagram of MIMO Zero-forcing Receiver and explain the function of each block in detail [15]

**UNIT IV**

- 7 a) Explain the need of Orthogonal Frequency-Division Multiplexing in present generations with example [7]  
b) List out different Multi carrier Basics of a OFDM and explain each one in detail [8]  
(OR)  
8 Draw the block diagram of Multi input and multi output OFDM and explain the function of each block in detail [15]

**UNIT V**

- 9 a) Discuss the factors which determine the choice of orbit for a communication satellite [7]  
b) Define elevation angle and derive the expression for it [8]  
(OR)  
10 a) Explain the brief history of Satellite communications. [7]  
b) Explain the different orbital effects in satellite communication system performance [8]



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**Set No. 3**

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**(Electronics and Communication Engineering)**

**Time: 3 hours**

**Max. Marks: 75**

*Answer any FIVE Questions  
ONE Question from Each unit  
All Questions Carry Equal Marks  
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**UNIT I**

- 1 a) Explain the concept of Diversity in Wireless Communication along with example [9]  
b) List out few comparisons of 2G and 3G wireless communication [6]  
(OR)  
2 a) How to find the Channel Estimation in Wireless Systems along with example [7]  
b) Write short notes on Rayleigh Fading Wireless Channel in detail [8]

**UNIT II**

- 3 Draw the basic structure of CDMA and explain the CDMA Mechanism in detail [15]  
(OR)  
4 a) List out different Fundamentals Codes of CDMA and explain each one in detail [9]  
b) List out different application of CDMA over TDMA [6]

**UNIT III**

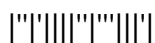
- 5 a) Explain the concept of MIMO System Model along with circuit diagram [7]  
b) How to find the channel estimation error in Zero forcing receiver explain [8]  
(OR)  
6 Explain the concept of SVD of MIMO Channel along with block diagram [15]

**UNIT IV**

- 7 a) What is the Effect of Frequency Offset in OFDM and Explain [7]  
b) List out different advantages and disadvantages of OFDM [8]  
(OR)  
8 Write short notes on following terms relate to OFDM [7]  
(i) Peak-to-Average Power Ratio (ii) Bit-Error Rate [8]

**UNIT V**

- 9 a) Explain the various frequency band allocations used for satellite services [7]  
b) What are the different launch vehicle selection factors? Explain [8]  
(OR)  
10 Draw and explain the simplified single conversion transponder (bent pipe) for 6/4 GHz band [15]



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**Max. Marks: 75**

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ONE Question from Each unit  
All Questions Carry Equal Marks*

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**UNIT I**

- 1 a) Explain the importance of wireless communication in present generations [7]  
b) How to find the BER in a Fading Channel along with one example [8]  
(OR)
- 2 a) Explain the procedure for BER Performance of Wireless Systems along with one example [9]  
b) List out different applications of 4G wireless communications [6]

**UNIT II**

- 3 a) Explain the concept of Multi-User CDMA along with circuit diagram [7]  
b) Why CDMA is advance than FDMA [8]  
(OR)
- 4 a) Why CDMA is needed and explain it with an example? [9]  
b) List out different applications of CDMA in detail [6]

**UNIT III**

- 5 Draw the circuit diagram of MIMO minimum mean-squared error receiver and explain the function of each block in detail [15]  
(OR)
- 6 Explain the following terms in detail [7]  
(i) Singular Value Decomposition (ii) MIMO System Model [8]

**UNIT IV**

- 7 a) Explain the concept of SC-FDMA along with block diagram [9]  
b) What are the advantage of OFDM over Frequency division multiplexing [6]  
(OR)
- 8 a) Explain the importance of Orthogonal Frequency-Division Multiplexing along with block diagram [9]  
b) Write short notes on Multicarrier OFDM [6]

**UNIT V**

- 9 a) Explain as to how a satellite is placed into geostationary orbit from earth? [9]  
b) Discuss the satellite development in India [6]  
(OR)
- 10 a) Draw the block diagram for satellite communication system. Explain the function of each block. [9]  
b) List the applications of satellites [6]

