**20EI505**

**Hall Ticket Number:**

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| **III/IV B.Tech (Regular) DEGREE EXAMINATION** | | | |
| **February, 2023** | **Electronics & Instrumentation Engineering** | | |
| **Fifth Semester** | **Analog & Digital communications** | | |
| **Time:** Three Hours | | **Maximum: 7**0 Marks | |
| *Answer Question No. 1 Compulsorily.* | | | (14X1 = 14 Marks) |
| *Answer* ***ANY ONE*** *question from each Unit.* | | | (4X14=56 Marks) |

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| 1. | a) | What is the need of Modulation? | CO1 | L2 | 1M |
|  | b) | Define Modulation index of AM Wave. | CO1 | L1 | 1M |
|  | c) | Define Amplitude and Angle Modulation? | CO1 | L1 | 1M |
|  | d) | State the Sampling Theorem for band limited signal of finite energy? | CO2 | L2 | 1M |
|  | e) | Infer about Quantization process? | CO2 | L3 | 1M |
|  | f) | List the advantages of PCM? | CO2 | L2 | 1M |
|  | g) | What are the sources of Noise? | CO3 | L2 | 1M |
|  | h) | Write down the expression for peak frequency deviation of FSK? | CO3 | L2 | 1M |
|  | i) | Define bandwidth efficiency? | CO3 | L1 | 1M |
|  | j) | What is QAM? | CO3 | L2 | 1M |
|  | k) | Define Burst error. | CO4 | L3 | 1M |
|  | l) | What is Prefix Coding? | CO4 | L2 | 1M |
|  | m) | Draw the Block diagram of a CDMA Transmitter and Receiver? | CO4 | L2 | 1M |
|  | n) | Explain GSM. | CO4 | L3 | 1M |
| **Unit -I** | | | | | |
| 2. | a) | Outline the generation of DSBSC wave with necessary block diagram and expression? | CO1 | L1 | 7M |
|  | b) | Determine the peak frequency deviation and modulation index (m) for an FM modulator with a deviation sensitivity Kf=5kHz/V and a modulating signal v(t)= 2COS (2∏2002t) | CO1 | L3 | 7M |
|  |  | **(OR)** |  |  |  |
| 3. | a) | Discuss about generation of FM with a neat block diagram? | CO1 | L2 | 7M |
|  | b) | Describe the Average power required for an Angle modulated wave with mathematical expression? | CO1 | L1 | 7M |
|  |  | **Unit -II** |  |  |  |
| 4. | a) | Illustrate the concepts of PWM in detail? | CO2 | L3 | 7M |
|  | b) | Explain the quantization process in detail and derive the expression for output signal to noise ratio of uniform quantizer? | CO2 | L4 | 7M |
|  |  | **(OR)** |  |  |  |
| 5. | a) | Discuss about the serial and parallel interfaces with suitable examples? | CO2 | L1 | 7M |
|  | b) | Explain the generation and detection of PPM with necessary diagrams? | CO2 | L3 | 7M |
|  |  | **Unit -III** | |  |  |
| 6. | a) | Differentiate Coherent and Non- Coherent detection? | CO3 | L4 | 7M |
|  | b) | Describe the generation and detection of FSK signal with necessary block diagram. | CO3 | L2 | 7M |
|  |  | **(OR)** |  |  |  |
| 7. | a) | Explain the working principle of ASK with Block diagram | CO3 | L1 | 7M |
|  | b) | With relevant expression and figure ,Describe QPSK Transmitter and receiver? | CO3 | L2 | 7M |
|  |  | **Unit -IV** |  |  |  |
| 8. | a) | State the relationship between mutual information and channel capacity and also derive the expression for mutual information? | CO4 | L1 | 7M |
|  | b) | Illustrate the Concepts involved in CDMA techniques? | CO4 | L3 | 7M |
|  |  | **(OR)** |  |  |  |
| 9. | a) | Explain FDMA and its advantages. | CO4 | L2 | 7M |
|  | b) | What is handover and explain its importance.. | CO4 | L3 | 7M |

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