**20EI505/PE**

**Hall Ticket Number:**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **III/IV B.Tech (Regular/Supplementary) DEGREE EXAMINATION** | | | |
| **January, 2024** | **Electronics and Instrumentation Engineering** | | |
| **Fifth Semester** | **Analog & Digital Communications** | | |
| **Time:** Three Hours | | **Maximum:** 70 Marks | |
| ***Answer question 1 compulsory.*** | | | **(14X1 = 14Marks)** |
| ***Answer one question from each unit.*** | | | **(4X14=56 Marks)** |
|  | | |  |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | |  |  | CO | BL | M |
| 1 | | a) | Define Frequency Modulation? | CO 1 | L2 | 1M |
|  | | b) | What are the advantages of SSB-SC over DSB-SC? | CO 1 | L2 | 1M |
|  | | c) | Define the Modulation index of the FM wave? | CO 1 | L2 | 1M |
|  | | d) | What is advantage of PCM over PAM? | CO 2 | L2 | 1M |
|  | | e) | Define Nyquist rate? | CO 2 | L2 | 1M |
|  | | f) | What are the types of internal Noise? | CO 2 | L1 | 1M |
|  | | g) | What is the Transmission B.W. of PCM? | CO 2 | L2 | 1M |
|  | | h) | Write any 2 differences between FSK and PSK? | CO 3 | L2 | 1M |
|  | | i) | What is Amplitude shift Keying? | CO 3 | L2 | 1M |
|  | | j) | What is baund rate of the PSK and FSK? | CO 3 | L2 | 1M |
|  | | k) | Define Entropy? | CO 4 | L1 | 1M |
|  | | l) | What is Mutual Information? | CO 4 | L1 | 1M |
|  | | m) | Different types of Handoff’s? | CO 4 | L2 | 1M |
|  | | n) | Define perigee and apogee? | CO 4 | L2 | 1M |
| **Unit-I** | | | | | | |
| 2 | | a) | What is amplitude modulation and explain how do you generate AM-FC signal with neat waveforms | CO 1 | L3 | 7M |
|  | | b) | Find the various frequency components and their amplitude in the Voltage given below s(t)=50(1+0.7cos5000t-0.3cos1000t) sin 5x106t. Draw the single sided spectrum. Also evaluate the modulated and sideband powers. | CO 1 | L3 | 7M |
| **(OR)** | | | | | | |
| 3 | | a) | Derive an expression for WBFM wave and show that the band width required is infinite (theoretically). | CO 1 | L3 | 8M |
|  | | b) | Obtain the expressions for single tone FM and PM by defining modulation index in each  case? | CO 1 | L2 | 6M |
| **Unit-II** | | | | | | |
| 4 | | a) | Explain, how a PPM signal can be generated from PWM signal? | CO 2 | L2 | 7M |
|  | | b) | Explain detection of PWM and PPM signal with neat sketch. | CO 2 | L2 | 7M |
| **(OR)** | | | | | | |
| 5 | a) | | Explain briefly the Block Diagram of PCM and write the advantages of PCM over PAM. | CO 2 | L3 | 7M |
|  | | b) | Write a short notes on different types of Noise. | CO 2 | L2 | 7M |
| **Unit-III** | | | | | | |
| 6 | | a) | Explain the Generation and Detection of ASK with neat sketches. | CO 3 | L2 | 7M |
|  | | b) | |  | | --- | | Compare ASK, FSK and PSK communication schemes. | | CO 3 | L3 | 7M |
| **(OR)** | | | | | | |
| 7 | | a) | What is PSK and Explain the 8-PSK Transmitter clearly? | CO 3 | L3 | 7M |
|  | | b) | Compare the 16- PSK and 16-QAM techniques. | CO 3 | L3 | 7M |
| **Unit-IV** | | | | | | |
| 8 | | a) | Apply Shannon-Fano coding to the source with 8 emitting messages having probabilities ½,3/20,3/20,2/25,2/25,1/50,1/100 and 1/100 respectively, and find the coding efficiency and redundancy. | CO 4 | L3 | 7M |
|  | | b) | |  | | --- | | Explain the concept of CDMA | | CO 4 | L2 | 7M |
| **(OR)** | | | | | | |
| 9 | | a) | Explain the concept of Mutual information and Derive its properties | CO 4 | L2 | 7M |
|  | | b) | Explain in detail about GSM. | CO 4 | L2 | 7M |

