**18EI505**

**Hall Ticket Number:**

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| **II/IV B.Tech (Regular) DEGREE EXAMINATION** | | | |
| **February, 2021** | **Electronics and Instrumentation Engineering** | | |
| **Fifth Semester** | **Analog & Digital Communication** | | |
| **Time:** Three Hours | | **Maximum: 5**0 Marks | |
| *Answer ALL Questions from PART-A.* | | | (1X10 = 10 Marks) |
| *Answer* ***ANY FOUR*** *questions from PART-B.* | | | (4X10=40 Marks) |
|  | | | **PART-A** |

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| 1. | a) | Why we need modulation? |  |  |
|  | b) | Define Sensitivity. |  |  |
|  | c) | Mention the Efficiency of DSB-SC. |  |  |
|  | d) | Mention the significance of Carson's Rule. |  |  |
|  | e) | Define companding. |  |  |
|  | f) | Define bit rate . |  |  |
|  | g) | Define Quadrature Amplitude modulation (QAM). |  |  |
|  | h) | Define MSC. |  |  |
|  | i) | What are the links in satellite communication? |  |  |
|  | j) | Why we need modulation? |  |  |
| **PART-B** | | | | |
| 2. | a) | When the modulation percentage is 75,an AM transmitter produces 10KW.How much of this is carrier power?What would be the percentage power saving if the carrier and one of the sidebands were suppressed before transmission took place? |  | 4M |
|  | b) | Define Amplitude modulation and modulation index.Derive the relation between the output power of AM transmitter and depth of modulation. |  | 6M |
|  |  |  |  |  |
| 3. | a) | Explain about NBFM and show that it is similar to Amplitude Modulation except the sign of the lower sideband.(proof with bessel or mathematical derivation 4m +phasor diagrams - 2m) |  | 6M |
|  | b) | Explain about pre emphasis and de-emphasis circuits and explain why pre-emphasis and de-emphasis circuits are used. |  | 4M |
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| 4. | a) | Explain in detail about the operation of PCM transmitter and receiver. |  | 6M |
|  | b) | Explain the generation of PWM and PPM. |  | 4M |
|  |  |  |  |  |
| 5. | a) | Describe FSK transmitter and Receiver. |  | 7M |
|  | b) | Determine the :  (i)peak frequency deviation (ii) minimum bandwidth (iii) baud for FSK signal with a mark frequency of 49 kHz, space frequency of 51 kHz, and input bit rate of 2 kbps. |  | 3M |
|  |  |  |  |  |
| 6. | a) | Describe with neat diagram, the operation of a QPSK modulator. Draw its phasor and constellation diagram. |  | 6M |
|  | b) | sketch the waveforms of in-phase and quadrature components of the QPSK signal in response to the input binary sequence 10011100. |  | 4M |
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| 7. | a) | Write shanno-fano code algorithm with example. |  | 5M |
|  | b) | A DMS X has four symbols x1,x2,x3 and x4 with P(x1)=1/2, P(x2)=1/4, P(x3)= P(x4)=1/8. Construct a shannon-fano code for X.Show that this code has the optimum property that ni=I(Xi) and that the code efficiency is 100 percent. |  | 5M |
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| 8. |  | Explain the concept of GSM. |  | 10M |
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| 9. |  | Define Handoff and explain its types in detail. |  | 10M |

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