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| **20EC404**  **Hall Ticket Number:**   |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | |  |  |  |  |  |  |  |  |  |      |  |  |  | | --- | --- | --- | | **II/IV B.Tech (Regular) DEGREE EXAMINATION** | | | | **August, 2022** | **Electronics and Communication Engineering** | | | **Forth Semester** | **Analog Communications** | | | **Time: Three Hours** | | **Maximum:70 Marks** | |  |
| |  |  | | --- | --- | | ***Answer question 1 compulsory.*** | **(14X1 = 14 Marks)** | | ***Answer one question from each unit.*** | **(4X14=56 Marks)** | |  |

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| 1. | a) | |  | | --- | | Define Modulation. | | CO1 |  |
|  | b) | State need of Modulation. | CO1 |  |
|  | c) | An audio signal given as 20Sin2π (1500t) amplitude modulates a carrier given as 80Sin2π (100000t). Determine the modulation index. | CO1 |  |
|  | d) | What is the maximum power efficiency of AM modulator? | CO1 |  |
|  | e) | What are the advantageous of single side band transmission? | CO2 |  |
|  | f) | Mention the different methods for generating SSB-SC signal. | CO2 |  |
|  | g) | What is a Vestigial Side Band Modulation? | CO2 |  |
|  | h) | What are the different types of angle modulation? | CO3 |  |
|  | i) | Determine the bandwidth of FM when the maximum deviation allowed is 75KHz and the modulating signal has a frequency of 10KHz. | CO3 |  |
|  | j) | State Carson’s Rule. | CO3 |  |
|  | k) | Distinguish between FM & PM. | CO3 |  |
|  | l) | What are the different types of Pulse Time Modulation? | CO4 |  |
|  | m) | Write the advantageous of PWM over PAM. | CO4 |  |
|  | n) | What is FM Threshold effect? | CO4 |  |
| **Unit –I** | | | | |
| 2. | a) | Describe the generation of Amplitude Modulated waves using Square Law Modulator method. | CO1 | 7M |
|  | b) | Draw the block diagram of COSTAS Loop and explain about DSB-SC Demodulation | CO1 | 7M |
| **(OR)** | | | | |
| 3. | a) | Explain about the Amplitude Modulation and represent the signals in Time and Frequency domains. | CO1 | 7M |
|  | b) | Explain the generation of DSB-SC signals using Balanced Modulator. using it. | CO1 | 7M |
| **Unit –II** | | | | |
| 4. | a) | Describe the generation of Single Side Band Suppressed Carrier (SSB-SC) using Phase discrimination method. | CO2 | 7M |
|  | b) | Explain about VSB Modulation & Demodulation. | CO2 | 7M |
| **(OR)** | | | | |
| 5. | a) | Explain the detection of SSB-SC using Coherent Detection method. | CO2 | 7M |
|  | b) | Compare SSB-SC and VSB. Also represents the waveforms in frequency domain. | CO2 | 7M |
| **Unit –III** | | | | |
| 6. | a) | Define FM. Derive the single tone FM equation and draw the relevant waveforms. | CO3 | 7M |
|  | b) | Explain the demodulation of FM using PLL | CO3 | 7M |
| **(OR)** | | | | |
| 7. | a) | Compare Narrowband FM and Wideband FM | CO3 | 7M |
|  | b) | A single tone FM is represented by a voltage equation as s(t) =12cos[6×108 t+5sin1250t]. Determine i) Carrier Frequency ii) Modulating frequency iii) Modulation Index iv) Maximum Deviation v) what power will this FM wave dissipate in 10Ω resistor. | CO3 | 7M |
| **Unit –IV** | | | | |
| 8. | a) | Explain the generation and detection of PAM. Also explain how the aperture effect is eliminated? | CO4 | 14M |
| **(OR)** | | | | |
| 9. | a) | Derive the expression for Signal to Noise ratio of DSB-SC receiver. | CO4 | 7M |
|  | b) | Explain capture effect and threshold effect in FM. | CO4 | 7M |

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