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SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)

B.Tech III Year I Semester Regular & Supplementary Examinations NOV-2019

ANALOG COMMUNICATIONS
(Electronics & Communication Engineering)

Time: 3 hours

Max. Marks: 60

(Answer all Five Units 5 x 12 = 60 Marks)

UNIT-I

- 1 a Draw the block diagram of Communication System and Explain the function of each block. **8M**
b Explain the concept of frequency mixing. **4M**

OR

- 2 a Explain generation of DSB-SC signal with the help of balanced modulator using diodes. **7M**
b An AM transmitter radiates 9kW of power when the carrier is un-modulated and 10.125kW of power when the carrier is sinusoidal modulated. Find the modulation index & Percentage modulation. Now if another sine wave corresponding to 40% modulation is transmitted Simultaneously. Calculate total radiated power. **5M**

UNIT-II

- 3 a Draw the block diagram of indirect FM method and explain the necessity of each block. **8M**
b A 20 MHz carrier is frequency modulated by a sinusoidal signal such that the peak frequency deviation is 100 kHz. Determine the modulation index and the approximate bandwidth of the FM signal if the frequency of the modulating signal is 1 kHz. **4M**

OR

- 4 a Derive the expression for single-tone frequency modulation with necessary wave forms. **6M**
b A single-tone FM is represented by the voltage equation as: $v(t) = 12\cos(6 \times 10^6 t + 5\sin 1250t)$. Determine the Carrier frequency, Modulating frequency, Modulation index & also find Power dissipated at 10Ω resistor. **6M**

UNIT-III

- 5 a Explain noise equivalent bandwidth and noise temperature. **8M**
b Give the Quadrature representation of Narrow-band noise. **4M**

OR

- 6 a Explain the noise performance of DSB-SC scheme with the help of neat block diagram. **6M**
b The noise figure of a receiver is 20dB and it is fed by a low noise amplifier which has gain of 40dB and noise temperature of 80^0K . Calculate the overall noise temperature of the receiving system and the noise temperature of the receiver. **6M**

UNIT-IV

- 7 a Explain natural and flat-top sampling techniques. **6M**
b Explain generation of PAM with mathematical analysis. **6M**

OR

- 8 a What are the differences between PAM, PWM, and PPM? **6M**
b Explain how PPM can be generated from PWM signals. **6M**

UNIT-V

- 9 a Explain about sensitivity, selectivity and fidelity. **4M**
b Draw block diagram of super hetero-dyne AM receiver and explain function of each block. **8M**

OR

- 10 a Compare TDM and FDM techniques. **6M**
b A Discrete source emits one of 5 symbols once every millisecond. The symbol Probabilities are $\frac{1}{2}, \frac{1}{4}, \frac{1}{8}, \frac{1}{16}$ and $\frac{1}{16}$. Find entropy and information rate? **6M**

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