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JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B.Tech II Year II Semester Examinations, March - 2022
ANALOG AND DIGITAL COMMUNICATIONS
(Electronics and Communication Engineering)

Time: 3 Hours   **Max. Marks: 75**

Answer any five questions
All questions carry equal marks
- - -

1.a) Draw and explain the circuits for generating AM and AM-SC using balanced modulators.
  b) Explain about COSTAS loop with a neat block diagram for demodulating DSB-SC wave.
                                                                                    [8+7]

2.a) Explain the working of envelope detector with a neat circuit diagram.
  b) Describe the single tone modulation of SSB. Assume both modulating and carrier signals are sinusoids.   [8+7]

3.a) Discuss the generation of FM wave using direct method.
  b) Explain how FM signal is detected with the help of PLLs.   [8+7]

4.a) Explain the detection of FM wave using balanced frequency discrimination.
  b) Compare of FM and AM.   [10+5]

5.a) How the transmitters are classified? Compare them.
  b) Draw the block diagram of TRF receiver and the function of each block.   [6+9]

6.a) Explain the need for non-uniform quantization in digital communications.
  b) Discuss the working of delta modulation system with a neat block diagram.   [6+9]

7.a) What is Inter Symbol Interference (ISI) and ISI free signals? Explain.
  b) Discuss about FSK with waveform and equation.   [7+8]

8.a) Write in-detail about BPSK with waveform and equations.
  b) Write a short note on optimum receiver.   [8+7]

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R18

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B.Tech II Year II Semester Examinations, July/August - 2021
ANALOG AND DIGITAL COMMUNICATIONS
(Electronics and Communication Engineering)

Time: 3 Hours   **Max. Marks: 75**

Answer any five questions
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1.a) Explain about COSTAS loop with a neat block diagram for demodulating DSB-SC wave.
 b) Explain the working of envelope detector with a neat circuit diagram. [8+7]

2.a) Define a standard form of amplitude modulation and explain the time and frequency domain expression of an AM wave.
 b) Calculate the percentage power saving when the carrier and one of the sidebands are suppressed in an AM wave modulated to a depth of 100% and 50%. [7+8]

3.a) Derive the expression for FM signal from fundamentals and differentiate narrow band FM and wide band FM.
 b) For an FM modulator with a modulating signal m(t)= $V_m\sin(300\times10^3t)$, the carrier Signal $V_C(t)=8\ \sin(6.5\times10^6t)$ and the modulator index = 2. Find out the significant sideband frequencies and their amplitudes. [7+8]

4.a) Compare noise performance of PM and FM system.
 b) Explain the indirect method of generation of FM wave and any one method of demodulating an FM wave [6+9]

5.a) Draw the block diagram of Superhetrodyne receiver and explain the function of each block.
 b) Compare and contrast AM and FM receivers. [9+6]

6.a) With a neat diagram explain AM receiver tracking and tracking curve.
 b) How the performance of the PCM system is influenced by the noise and calculate SNR in the PCM system? [7+8]

7.a) With a neat block diagram explain the generation of PWM signal.
 b) With a neat waveform explain Flat-top PAM sampling. [7+8]

8.a) Discuss about the coherent FSK detector and non-coherent FSK detector.
 b) Explain the generation and reception of DPSK signals with a neat block diagram. [7+8]

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R18

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B.Tech II Year II Semester Examinations, August/September - 2021
ANALOG AND DIGITAL COMMUNICATIONS
(Electronics and Communication Engineering)

Time: 3 Hours   **Max. Marks: 75**

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1.a) Describe the single tone modulation of SSB with necessary equations. Assume both modulating and carrier signals are sinusoids.
  b) With the help of circuit diagram explain the operation of square law modulator for AM.
                                                                                                                  [7+8]

2.a) With neat diagrams, explain about the VSB modulation system and also explain its applications.
  b) When the modulation percentage is 75, an AM transmitter produces10KW. How much of this is carrier power. What would be the percentage power saving if the carrier and one of the side bands were suppressed?   [7+8]

3.a) Explain the detection of FM wave using balanced frequency discrimination.
  b) State and explain the concept of transmission bandwidth.   [9+6]

4.a) Draw and explain how PLL is used in detection of FM signal.
  b) What is the purpose of pre-emphasis and de-emphasis filtering? Explain the filtering process with suitable sketches.   [7+8]

5.a) What is AGC? What are different types of AGC? With a neat diagram explain a simple AGC circuit.
  b) List and explain the characteristics of RF section.   [9+6]

6.a) Explain the working of tuned radio frequency receiver with the help of a block diagram.
  b) Compare AM and FM Receivers.   [9+6]

7.a) Explain, how a PPM signal can be generated from PWM signal.
  b) Compare PAM, PWM and PPM pulse modulation technique.   [7+8]

8.a) Derive the probability error of QPSK system.
  b) Derive the bit error probability of a coherent ASK signaling scheme.   [7+8]

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