DHANALAKSHMI SRINIVASAN ENGINEERING COLLEGE
DEPARTMENT OF BIOMEDICAL ENGINEERING
ANALOG & DIGITAL COMMUNICATION
QUESTION BANK

UNIT I (ANALOG MODULATION)
PART A

1. Define modulation.
2. What is the need for modulation?
3. Draw the block diagram of communication system.
4. Give the types of modulation.
5. What is amplitude modulation?
6. Define sensitivity
7. For an AM commercial broadcast band receiver (535 KHz-1605 KHz) with an input filter
8. Q factor of 54, determine the bandwidth at low and high ends of the RF spectrum.
9. Define modulation index and percent modulation in AM.
10. State disadvantage of low level modulator (AM).
11. For an unmodulated carrier amplitude of 16Vp and a modulation coefficient m=0.4, determine the amplitudes of the modulated carrier and side frequencies.
12. For m=0.4 ,Pc=2000W ,Determine   i)Total sideband power ii)Total transmitted power
13. What is image frequency? Give the expression of IFRR.
14. Define Angle modulation
15. What is frequency modulation?
16. Define frequency deviation. give an expression for modulation index.
17. What is the bandwidth required for an FM signal in which the modulating frequency is 2 KHz and maximum deviation is 10 KHz.
18. What is deviation ratio in FM.?
19. If frequency deviation is 5 KHz for a 10v modulating signal, determine deviation sensitivity.

20. What are the types of FM demodulators?

21. What is the bandwidth required for an FM signal in which the modulating frequency is 2 KHz and maximum deviation is 10 KHz.

22. What is phase modulation?

23. Define Adjacent channel interference

24. Define Carson's rule.

25. Calculate the bandwidth using Carson's rule for maximum frequency deviation and modulating signal

26. Give the modulation index for FM and PM

PART B

1. Explain with neat sketches the different types of amplitude modulator.

2. Explain AM Receiver parameters

3. Draw and explain the block diagram of low level AM transmitter

4. Draw and explain the block diagram of high level AM transmitter

5. Explain the working of a super heterodyne receiver with suitable block diagram.

6. Explain the working of a tuned radiofrequency receiver with suitable block diagram.

7. Explain the working of Varactor diode FM modulator.

8. Explain the working of direct PM modulators

9. Explain the working of foster seeley discriminator with diagram.

10. Sketch and explain the working of direct FM transmitter.

11. Sketch and explain the PLL FM demodulator.

UNIT II (PULSE MODULATION)

PART A

1. Draw the block diagram of DPCM.

2. What are the types Pulse Modulation?

3. Define Sampling rate.

4. Define Nyquist rate

5. What is aliasing?

6. What are the errors occur in Delta Modulation? Explain.

7. Differentiate between FDM and TDM

8. Give the advantages & disadvantages of DPCM?

9. Define Pulse amplitude modulation.

10. What is a Channel vocoder?

11. What are the disadvantages of PCM?

12. What are the advantages of ADPCM?

PART B

1. Explain the working of Delta modulation.

2. Explain PAM.

3. Explain the working of PCM transmitter and receiver.

4. Explain the working of Adaptive Delta modulation.

5. Explain delta modulation and DPCM.

6. Explain Line coding.

7. Explain the working of ADPCM transmitter and receiver.

UNIT III (DIGITAL MODULATION & TRANSMISSION)
PART A

1. What is Redundancy?

2. What is the use of Eye pattern?

3. Draw the Signal Constellation diagram of 8-PSK Modulation.

4. State the correlation property of Maximal Length Sequence.

5. Define LPC

6. Draw the waveform of ASK, FSK for a sequence

7. Define DPSK

8. State the correlation property of Maximal Length Sequence

9. Explain cosine filters.

10. Draw the Eye Pattern.

11. Define Equalizers.

12. What is Duo binary encoding?

PART B

1. What is ISI? How can it be determine.

2. Sketch and explain working of RAKE receiver.

3. Explain in detail about QPSK modulation scheme.

4. Write about the performance of M-ary PSK.

5. Explain the function of DBPSK transmitter and receiver.

6. With neat block diagram explain the operation of QAM transmitter. Draw its output signal constellation diagram.

7. Discuss about the power spectrum and bandwidth efficiency of   M-ary modulation schemes.

8. Explain BPSK transmitter and receiver with help of block diagram?

9. The bit stream 1011100011 is to be transmitted using DPSK. Determine the encoded sequence and transmitted phase sequence.

UNIT IV (INFORMATION THEORY & CODING)
PART A

1. State Shannon's Fundamental theorem of information theory.

2. Define LPC

3. Define Huffman coding

4. Explain source coding theorem.

5. What is a cyclic code?

6. Give the expression for Channel capacity and explain.

7. What is Entropy?

8. State Shannon-Hartley Law.

9. What is Shannon's limit?

10. Discuss about convolutional encoding.

11. Explain Syndrome calculation.

12. What are the Error control codes?

PART B

1. Sketch and explain working of RAKE receiver.
2. Explain working of costas loop.
3. Explain the working of Multi pulse excited LPC and Code excited LPC by Suitable diagrams.
4. Explain Viterbi coding with an example.
5. Design a Huffman code for a source that puts an alphabet a_1 to a_5 to the corresponding probabilities

   $a_1 = 0.2$

   $a_2 = 0.4$

   $a_3 = 0.2$

   $a_4 = 0.1$

   $a_5 = 0.1$
6. Define Entropy and in detail about its Properties.

UNIT V (SPREAD SPECTRUM & MULTIPLE ACCESS)
PART A

1. Give the applications of spread spectrum modulation
2. Define Processing gain. Give an expression for processing gain.
3. What is spread spectrum modulation. State its advantages
4. Mention the Processing gain of DS and FH Spread spectrum techniques.
5. What is Time division multiple access?
6. What is fast and slow frequency hopping?
7. What are the three Properties of PN Sequences?
8. Give the applications of wireless communications.
9. What is Near-far problem?
10. What is Frequency reuse?

11. What is Code division multiple access?

PART B

1. What are the different types of multiple access techniques?
2. Derive the Processing gain of DHSS& FHSS.
3. Explain FDMA with a suitable diagram.
4. Explain TDMA with a suitable diagram.
5. Explain CDMA with a suitable diagram.
6. Write in brief about Synchronization and Tracking.

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