Sub.Code   : CS2204   Semester : III
Sub.Title   : ANALOG AND DIGITAL COMMUNICATION

UNIT - I
FUNDAMENTALS OF ANALOG COMMUNICATION
PART-A (2 Marks)

1. Define amplitude modulation
2. Define modulation Index.
3. What is the highest modulation Index and percent modulation possible with a
Conventional AM system without causing excessive distortion?
4. For 100% modulation what is the relationship between the voltage amplitudes of the side
band frequencies and the carrier?
5. What does AM-DSBFC stand for?
6. Describe the relationship between the carrier and sideband powers in an AM DSBFC
wave.
7. Draw The Amplitude Modulation Wave Forms With Modulation Index (m) =1, m<1, m>1.
8. The antenna current of an AM transmitter is 8A when only carrier is sent. It increases to
8.93A when The carrier is modulated by a single sine wave. Find the percentage modulation.
9. Compare AM with DSB-SC and SSB-SC.
10. Define image frequency
11. Define Angle modulation
12. Draw the FM and PM waveforms
13. Draw The Phasor Diagram Of Narrow Band FM.
14. What is the need of Pre-emphasis and de-emphasis in FM transmission?.
15. Name Different Types of FM Detectors.
16. Define Modulation Index for FM and PM.
17. Compare FM with AM.
18. State Carson's general rule for determining the bandwidth for an angle modulated wave.

PART-B (16 Marks)

19. Define AM. Derive the expression for AM wave (16)
20. Explain about coherent detection of AM with carrier. (16)
21. Draw the block diagram of AM Superhetrodyne receiver and explain function of each
block. (16)
22. Define FM. Derive the equation of FM wave. (16)
23. An AM signal given by the equation e=6.5(1+0.5sin5027t)cos10053 x 103 t.
where 't' is expressed in seconds. Find (i) Ec (ii) fc (iii) fm (iv) ma (v) Em
(vi) flsb(viii) f usb (viii) Amplitude of LSB and USB. (16)

UNIT - II
DIGITAL COMMUNICATION
PART-A (2 Marks)

1. State shannon's Hartley law of information capacity.
2. Differentiate bit rate and baud rate.
3. Give the expression of peak frequency deviation of FSK.
4. Define modulation index of FSK.
5. What is M-ary encoding
6. What is QAM.
7. Define Bandwidth efficiency.
8. List the methods of achieving carrier recovery.
9. Give the principles of PLL.

PART-B (16 Marks)

10. What is frequency shift keying ? Explain in detail about FSK transmitter and receiver. (16)
11. With a neat schematic diagram, explain the Balanced ring modulator of BPSK (16)
12. Briefly explain the BPSK transmitter and BPSK receiver (16)
13. Explain the operation of QPSK transmitter and receiver. (16)
14. (i)Describe the two techniques of achieving carrier recovery circuit. (16)
(ii)Discuss in detail about the DPSK transmitter and DPSK receiver
15. Explain in detail about 8 QAM transmitter and receiver. (16)

UNIT - III
DIGITAL TRANSMISSION
PART-A (2 Marks)

1. What is the purpose of sample and hold circuit
2. What is the difference between natural sampling and flat top sampling
3. What is Nyquist Sampling rate
4. Define quantization and quantization error
5. Define A law companding and μ law companding
6. Define the term "Aliasing"
7. Give the concept of delta modulation
8. Define eye pattern
9. Define forward error correction
10. Define CRC
11. What is ISI?
12. What you mean by slope over load distortion
13. How the granular noise can be reduced.
14. What is meant by Pulse Amplitude Modulation (PAM)

PART-B (16 Marks)

15. Explain in detail about the operation of PCM transmitter and receiver. (16)
16. (i) Explain delta modulation with the help of transmitter and receiver diagrams. (12)
(ii) What is Quantizing error? Illustrate with an example. (4)
17. (i) Explain the operation of DPCM transmitter and receiver (8)
(ii) Explain in detail about ISI & Eye diagram (8)
18. What is meant by companding , Describe the concept of analog companding. (16)
19. With a neat sketch explain the operations of digital companding (16)

UNIT - IV
DATA COMMUNICATIONS
PART-A (2 Marks)

1. List some standard organization for data communication
2. What is meant by DTE and DCE?
3. What are the types of data transmission?
4. What is the difference between serial and parallel transmission?
5. What is meant by transmission modes and give its types.
6. What are the types of characters used in data communication codes.
7. What is meant by Baudot code?
8. What is meant by the term "Checkcum"
9. What is the use of scrambler and descrambler..
10. What is the difference between synchronous and asynchronous modem

PART-B (16 Marks)

11. Give brief note on the various data communication codes used in the network (16)
12. With an equivalent example, explain the various error detection techniques (16)
13. What is meant by UART ? Explain the operation of UART transmitter & receiver (16)
14. What is meant by RS232 serial interface ? Explain the operation and pin diagram. (16)
15. With a neat block diagram, explain the concept of UART transceiver operation (16)
16. With an equivalent example, explain the various error detection techniques (16)
17. What are parallel interfaces? Describe in detail about centronics parallel interface (16)
18. (i) Describe in detail about medium and high speed modems. (8)
(ii) Differentiate between Synchronous and Asynchronous modem. (8)

UNIT – V
SPREAD SPECTRUM AND MULTIPLE ACCESS TECHNIQUES
PART-A (2 Marks)

1. What is the need for spread spectrum?
2. List out Characteristics of Spread Spectrum Modulation.
3. Define frequency hopping spread spectrum.
3. What is Spread Spectrum?
4. What are the types of Spread Spectrum?

5. Define and express PN sequence using bipolar sequence.
6. Define Hand off technique.
7. Define CDMA
8. Define multi path propagation
9. Define GSM
10. Draw the frame structure of GSM
11. What is source coding of speech? List the types of Predictive coding
12. Define processing gain.
13. What are the roles of mobile switching center?

PART-B (16 Marks)

12. (i)Describe direct sequence spread spectrum with coherent BPSK (8)
(ii) Derive Processing gain for spread spectrum system (8)
14. (i) Describe Slow and Fast Frequency Hopping (8)
(ii) Draw the block diagram of RAKE receiver and explain the operation (8)
15 (i) Give the advantages associated with spreading a signal spectrum. (6)
(ii) Describe the structure of feedback shift register for generating PN sequences. (10)
16 (i) Explain FH-CDMA acquisition and tracking with neat sketches. (8)
(ii) Compare TDMA,FDMA and CDMA multiple access techniques. (8)