



# KINGS

COLLEGE OF ENGINEERING



**DEPARTMENT OF INFORMATION TECHNOLOGY**  
**QUESTION BANK**

**Subject Code : EC1207**

**Subject Name: Principles Of Communication**

**Year/Sem:II/III**

**UNIT -I**

**PART- A (2 MARKS)**

1. As related to AM, what is over modulation, under modulation and 100% modulation?
2. Define modulation index of an AM signal
3. Draw the circuit diagram of an envelop detector
4. A transmitter radiates 9 kW without modulation and 10.125 kW after modulation. Determine depth of modulation.
5. Define the transmission efficiency of AM signal.
6. Draw the phasor diagram of AM signal.
7. Advantages of SSB.
8. Disadvantages of DSB-FC.
9. What are the advantages of superhetrodyne receiver?
10. Distinguish between low level and high level modulator.
11. Give the parameters of receiver.
12. Define sensitivity and selectivity.
13. Define fidelity.
14. What is meant by image frequency?
15. Need for modulation.
16. Application of AM.
17. What is meant by diagonal clipping and negative peak clipping?
18. Define envelope.
19. Distinguish between linear and non linear modulator.
20. What are the limitations of AM
21. Draw the envelope of AM
22. Differentiate phase modulation and frequency modulation.

23. When a signal  $m(t) = 3 \cos (2\pi \times 103t)$  modulates a carrier  $c(t) = 5 \cos (\pi \times 106t)$ , find the modulation index and transmission bandwidth if the modulation is AM.

**PART- B (16 MARKS)**

1. Explain the detection of AM signals using envelope detector.
2. Explain the principle of working FM system modulation and demodulation.
3. Explain about AM transmitters.
4. with the help of neat block diagram explain functioning of a super heterodyne receiver list out significance
5. Explain the following
  - (a) Narrowband & wideband of FM signal (8)
  - (b) Direct & indirect methods of FM generation (8)
6. With the help of neat block diagram explain functioning of a Double conversion AM receiver list out significance .

**UNIT - II**

**PART – A (2 MARKS)**

1. What do you mean by narrowband and wideband FM?
2. Give the frequency spectrum of narrowband FM?
3. Why Armstrong method is superior to reactance modulator.
4. Define frequency deviation in FM?
5. State Carson's rule of FM bandwidth?
6. Differentiate between narrow band and wideband FM.?
7. What are the advantages of FM.?
8. Define PM.
9. What is meant by indirect FM generation?
10. Draw the phasor diagram of narrow band FM.
11. Write the expression for the spectrum of a single tone FM signal.
12. What are the applications of phase locked loop?
13. Define modulation index of FM and PM.
14. Differentiate between phase and frequency modulation.

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15. A carrier of frequency 100 MHz is frequency modulated by a signal  $x(t)=20\sin(200\pi \times 10^3 t)$ . What is the bandwidth of the FM signal if the frequency sensitivity of the modulator is 25 KHz per volt?
16. What is the bandwidth required for an FM wave in which the modulating frequency signal is 2 KHz and the maximum frequency deviation is 12 KHz?
17. Determine and draw the instantaneous frequency of a wave having a total phase angle given by  $\phi(t)= 2000t +\sin 10t$ .

### **PART- B (16 MARKS)**

1. Explain the indirect method of generation of FM wave and any one method of demodulating an FM wave
2. Derive the expression for the frequency modulated signal. Explain what is meant by narrowband FM and wideband FM using the expression
3. Explain any two techniques of demodulation of FM.
4. Explain the working of the reactance tube modulator and derive an expression to show how the variation of the amplitude of the input signal changes the frequency of the output signal of the modulator
5. Draw the frequency spectrum of FM and explain. Explain how Varactor diode can be used for frequency modulation.
6. Discuss the indirect method of generating a wide-band FM signal.
7. Draw the circuit diagram of Foster-Seelay discriminator and explain its working.(16)
8. Explain the principle of indirect method of generating a wide-band FM signal with a neat block diagram.

### **UNIT - III**

#### **PART – A (2 MARKS)**

1. Differentiate coherent and non coherent digital modulation methods
2. What is correlative coding?
3. Compare bandwidth of M-ary PSK signal And M-ary FSK signal
4. Sketch the waveform of PSK for binary sequence 1100101.
5. Differentiate QPSK and BPSK.
6. Differentiate ASK and FSK.
7. What are the type of digital data format.
8. Define minimum Shift keying.

9. Define Duobinary encoding
10. Define DPSK.

**PART – B (16 MARKS)**

1. With block diagram explain the principle of Coherent FSK transmitter and receiver.
2. Explain the operation of QPSK transmitter and receiver.
3. Explain the generation and detection of DPSK signal
4. Explain in detail ASK FSK and PSK digital modulation techniques.
5. With block diagram explain the principle of duobinary encoding
6. With block diagram explain M-ary PSK receiver. Compare M-ary modulation schemes

**UNIT IV**

**PART – A (2 MARKS)**

1. State sampling theorem.
2. What is aliasing?
3. How to avoid aliasing effect.
4. Define eye pattern.
5. Define PAM.
6. Construct NRZ and RZ format for 011010.
7. Define adaptive equalization.
8. Define ISI.
9. Define Nyquist Criteria.
10. What is the interpretation obtained from eye pattern?

**PART –B (16 MARKS)**

1. State and prove Sampling theorem.
2. Explain various data formats with clear example.
3. What is eye pattern. What are the interpretations obtained from it?
4. Write notes on Intersymbol Interference.
5. Explain in detail the Nyquist criterion for distortionless transmission of baseband PAM signal
6. Write notes on adaptive equalization

**UNIT V**

**PART – A (2 MARKS)**

1. Define pseudo noise sequence.
2. Define spread spectrum technique
3. Differentiate Slow and fast FH SS technique.
4. Differentiate TDMA and FDMA.
5. Define processing gain for DS SS technique
6. What are the advantages of Spread Spectrum techniques?
7. Differentiate DS –SS and FH-SS.
8. Define processing gain for FH SS technique
9. What are the disadvantages of DS SS techniques?
10. What are the advantages of FH SS techniques?

**PART –B (16 MARKS)**

1. Explain in detail the transmitter and receiver of DS SS technique.
2. Explain in detail the transmitter and receiver of FH SS technique.
3. Explain in detail the characteristics of PN sequence
4. Explain the two common multiple access technique for wireless communication.
5. Differentiate direct sequence and frequency hop spread spectrum technique
6. Compare and contrast TDMA and CDMA techniques.

