SHAHEED BHAGAT SINGH STATE TECHNICAL CAMPUS, FEROZEPUR

ROLL No: | | | | | | | | | | | | | **Total number of pages:[2]**
Total number of questions: 06

B.Tech. || ECE || 3rd Sem

Analog Communication Systems

Subject Code: BTEC-301A

Paper ID:

Time allowed: 3 Hrs **Max Marks: 60**

Important Instructions:

- **All questions are compulsory**
- **Assume any missing data**

PART A (10x 2marks)

Q. 1. Short-Answer Questions:

(a) Why modulation is necessary in communication?
(b) Define sensitivity and selectivity.
(c) A 10kW carrier wave is amplitude modulated to 80% by a sinusoidal modulating signal. Calculate total power of the AM wave.
(d) What is image frequency and its rejection ratio?
(e) What is role of pre-emphasis circuit?
(f) What are disadvantages of direct methods of FM generation? How can these be overcome?
(g) Differentiate between low level and high level modulation.
(h) A 1MHz carrier is frequency modulated with a sinusoidal 2kHz signal such that the peak deviation is 6kHz. Calculate the modulation index.
(i) List advantages and disadvantages of SSB over AM.
(j) What do you mean by vestigial side band (VSB). What are its applications?

PART B (5×8marks)

Q. 2. Derive expression for AM wave in time domain and frequency domain. Also draw waveforms and frequency spectrum. CO1

OR

Compare amplitude modulation, frequency modulation and phase modulation. CO1

Q. 3. Discuss generation of DSB-SC signal using FET balanced modulator. Prove mathematically that balanced modulator suppresses carrier. CO2

OR

What are disadvantages of TRF receiver? How can these be overcome by super-hetrodyne receiver? Explain with the help of block diagram of super-hetrodyne receiver. CO2

Q. 4. Discuss generation of FM signal using reactance modulator. CO3

OR

Explain working of balanced slope detector. What are its advantages and disadvantages? CO3

Q. 5. Explain filter method of SSB generation. Give its advantages and disadvantages. CO4

OR

Explain working of SSB envelope detection receiver. CO4

Q. 6. a) Compare narrow band and wide band FM. CO1

b) Discuss different types of AGC. CO2

OR

a) Discuss various types of pulse modulation using waveforms. CO1

b) Explain working of envelope detector using circuit diagram and waveform. CO2