

Roll No.

Total No. of Pages : 02

Total No. of Questions : 09

**B.Tech. (ECE) (Sem.-4)**  
**ANALOG COMMUNICATION SYSTEMS**

Subject Code : BTEC-401

M.Code : 57593

Date of Examination : 02-06-2023

Time : 3 Hrs.

Max. Marks : 60

**INSTRUCTION TO CANDIDATES :**

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

**SECTION-A**

**1. Answer briefly :**

- a) How many AM broadcast stations can be accommodated in a 100-kHz bandwidth, if the highest frequency modulating a carrier is 5kHz?
- b) Draw only the circuit diagram of PWM detector.
- c) What is Heterodyning principal of FM receiver.
- d) Define the terms selectivity and fidelity.
- e) State sampling theorem.
- f) What is vestigial side band transmission?
- g) Write the role of RF and IF amplifiers in AM receiver.
- h) Compare high level and low level AM transmission system.
- i) A 2kHz audio signal modulates a 50MHz carrier, causing a frequency deviation of 2.5kHz. Determine the band width of the FM signal.
- j) Derive the expression of total power of AM system.

## SECTION-B

2. Derive an expression for a single tone frequency modulated wave.
3. Draw the circuit diagram of varactor diode modulator and explain its working.
4. Derive the expression for the percentage power saving in AM-SSB-SC with respect to AM-DSB-FC under Tone Modulation.
5. A frequency modulated signal which is modulated by a 3-kHz sine wave reaches a maximum frequency of 100.02MHz and minimum frequency of 99.98MHz.
  - a) Determine the carrier swing.
  - b) Find the carrier frequency.
  - c) Calculate the frequency deviation of the signal.
  - d) What is the modulation index of the signal?
6. Explain Envelop detection receiver in detail.

## SECTION-C

7. Explain the following:
  - a) Self excited Additive Mixers
  - b) PPM modulator and demodulator circuit.
8.
  - a) Explain the difference between narrowband FM and wide band FM.
  - b) Explain Armstrong method of FM transmission.
9.
  - a) Explain with derivation the phase shift method of SSB generation.
  - b) What do you mean by Aliasing? When it occurs? How aliasing can be avoided in case of sampling of practical information signals?

**NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.**