

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VI (NEW) EXAMINATION – SUMMER 2023****Subject Code:3163206****Date:04-07-2023****Subject Name:Analog and Digital Communication****Time:10:30 AM TO 01:00 PM****Total Marks:70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

- Q.1** (a) Describe the need of modulation in communication system. **03**
 (b) A carrier is frequency modulated with a sinusoidal signal of 2 khz **04**
 resulting in a maximum frequency deviation of 5 khz. Find i) Modulation
 index ii) bandwidth of modulated signal.
 (c) Describe briefly shot noise, Transit-time noise and flicker noise. Why they **07**
 are generated?
- Q.2** (a) Compare ASK and FSK. **03**
 (b) An audio signal given as $15 \sin(2\pi(1500t))$ amplitude modulates a carrier **04**
 given as $60 \sin(2\pi(100,000t))$. Determine the following
 1.Determine the percentage of index
 2.Determine all frequency component
 (c) Explain the working of amplitude demodulator circuit with the remedy **07**
 for avoiding diagonal peak clipping and negative peak clipping?
- OR**
- (c) List the methods used to generate SSB modulation signal .discuss any one **07**
 method in detail.
- Q.3** (a) ExplainPCM with necessary diagram. **03**
 (b) What is noise Temperature and noise factor? **04**
 (c) Discuss the basic principal of FM detection and explain Foster-seeley **07**
 discriminator.
- OR**
- Q.3** (a) Explain PPM with necessary diagram. **03**
 (b) Explain in brief shift keying (FSK) technique and list applications of it. **04**
 (c) Discuss the importance of pre-emphasis and de-emphasis circuits in FM. **07**
- Q.4** (a) Explain CDMA in brief. **03**
 (b) Write a difference between AM and FM receivers. **04**
 (c) Draw the general block diagram of superheterodyne receiver and briefly **07**
 explain the function of each block.
- OR**
- Q.4** (a) Write short note on latest trends in digital Communication. **03**
 (b) Explain what double spotting is and how it arises. **04**
 (c) Draw the block diagram of Tuned radio Frequency (TRF) Receiver and **07**
 explain its operation. Describe the problems in TRF receiver.

- Q.5** (a) Compare DM and ADM. **03**
(b) Explain direct sequence spread spectrum system. **04**
(c) Explain non coherent detection of Amplitude shift keying (ASK) signal with necessary equations and diagrams. **07**

OR

- Q.5** (a) Compare DPCM and PCM. **03**
(b) Explain Frequency hopping spread spectrum system. **04**
(c) Explain coherent detection of Frequency shift keying (FSK) signal with necessary equations. **07**
