

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VI (NEW) EXAMINATION – SUMMER 2022****Subject Code:3163206****Date:01/06/2022****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.

		MARKS
Q.1	(a) Explain the need of modulation in communication systems.	03
	(b) Give comparison of AM and FM systems.	04
	(c) Write a short note on Super Heterodyne Receiver.	07
Q.2	(a) Give comparison of Wide band and Narrow band FM.	03
	(b) Describe Noise Temperature.	04
	(c) An AM modulating signal $10 \cdot \sin(2\pi \times 500t)$ is used to modulate a carrier signal $50 \cdot \sin(2\pi \times 100000t)$. Find modulation index, bandwidth, frequencies of sideband components and their amplitude. Draw the frequency spectrum of AM wave.	07
OR		
	(c) Describe various internal noises in detail.	07
Q.3	(a) Write a short note on full carrier AM transmitter.	03
	(b) Derive mathematical representation of Amplitude Modulation and explain signification of Modulation Index with necessary waveforms.	04
	(c) Explain the importance of Pre-emphasis and De-emphasis circuits in FM. Sketch a typical Pre-emphasis and De-emphasis circuit.	07
OR		
Q.3	(a) What is single sideband suppressed carrier modulation? Why it is used?	03
	(b) For FM System, the modulating frequency is 4 KHz and maximum frequency deviation is 20 KHz. Calculate modulation index β and bandwidth of the system using Carson's Rule.	04
	(c) Explain Armstrong method of FM generation with neat diagram.	07
Q.4	(a) Explain block diagram of analog communication system.	03
	(b) Explain pulse width modulation with necessary diagram.	04
	(c) Draw Block diagram of frequency hopping spread spectrum (FHSS) system and Explain Frequency Hopping with necessary waveforms.	07
OR		
Q.4	(a) Explain CDMA in brief.	03
	(b) Draw ASK, FSK and PSK waveform for the given binary data: 1001001101011001.	04
	(c) What is the difference between Coherent and Non-Coherent Detection techniques? Discuss Coherent Detection of FSK signal.	07

- Q.5** (a) Draw the circuit diagram of delayed AGC and explain its operation. **03**
(b) Explain Tuned Radio Frequency (TRF) Receiver with necessary diagram. **04**
(c) Explain working principle of Delta modulation with help of block diagram. What are the problems associated with Delta Modulation? **07**

OR

- Q.5** (a) Write short note on latest trends in Digital Communication. **03**
(b) Explain External noise. **04**
(c) Enlist and compare different digital modulation techniques. **07**
