

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-VI(NEW) – EXAMINATION – SUMMER 2019

Subject Code:2163206

Date:16/05/2019

Subject Name:Analog and Digital Communication (ICT)

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.

		MARKS
Q.1	(a) Explain General Communication System with Block Diagram.	03
	(b) Derive Mathematical Representation of Amplitude Modulation and Explain Signification of Modulation Index with necessary Waveforms.	04
	(c) Write a Short note on Super Heterodyne Receiver.	07
Q.2	(a) Explain CDMA in brief.	03
	(b) An Amplifier operating over the Frequency Range from 19 MHz to 22 MHz has a 5 K Ω input resistor. Using thermal agitation noise formula, find RMS Noise Voltage and Noise Power at the input to this amplifier if the ambient temperature is 29°C. Boltzmann's Constant $k=1.38 \times 10^{-23}$ J/K.	04
	(c) What are the different methods for Generation of FM Signals? Explain any one method in detail.	07
	OR	
	(c) Explain the importance of Pre-emphasis and De-emphasis circuits in FM. Sketch a typical Pre-emphasis and De-emphasis circuit.	07
Q.3	(a) Write a short note on Radio Communication with neat Sketch.	03
	(b) State Friss Formula for overall Noise Factor of amplifiers in cascade and Using Friss Formula, Find Overall Noise Figure of three stage cascaded amplifier, each stage having a power gain of 10 dB and noise figure of 5 dB	04
	(c) Draw Block diagram of frequency hopping spread spectrum (FHSS) system and Explain Frequency Hopping with necessary waveforms.	07
	OR	
Q.3	(a) Give comparison of Wideband and Narrowband FM.	03
	(b) Write a short note on Full carriers AM transmitters	04
	(c) An AM modulating signal $5 \sin(2\pi \times 200t)$ is used to modulate a carrier signal $25 \sin(2\pi \times 25000t)$. Find modulation index, percentage modulation, frequencies of sideband components and their amplitude. Draw the spectrum of AM wave.	07
Q.4	(a) Introduce pulse width modulation. With neat sketch explain generation of PWM.	03
	(b) Derive the formula for the instantaneous value of an FM voltage and define the modulation index. And draw the waveforms of information signal and its FM modulated signal.	04
	(c) Enlist and compare different digital modulation techniques.	07

- Q.4** (a) For FM System, the modulating frequency is 10 KHz and maximum deviation is 75 KHz Calculate bandwidth of system using Carson's Rule. **03**
- (b) Write short note on latest trends in Digital Communication. **04**
- (c) Explain working principle of Delta modulation with help of block diagram. What are the problems associated with Delta Modulation? **07**

- Q.5** (a) What do you mean by VSB Modulation and Why it is used? **03**
- (b) For Binary data: 1101001100111001 Draw ASK, FSK and PSK waveform. **04**
- (c) Compare Amplitude Modulation, Frequency Modulation and Phase Modulation. **07**

OR

- Q.5** (a) State the Advantages and Application of Spread Spectrum Communication. **03**
- (b) Explain Pulse Code Modulation with necessary waveforms. **04**
- (c) What is the difference between Coherent and Non-Coherent Detection techniques? Discuss Coherent Detection of FSK signal. **07**

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