

**SIDDARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR**



(AUTONOMOUS)

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**QUESTION BANK (DESCRIPTIVE)**

**Subject with Code: ICS(20EC0451)**

**Course & Branch: B.Tech & CSE, CSM, CIC**

**Year & Sem: III-B.Tech. & I-Sem.**

**Regulation: R20**

**UNIT –I  
INTRODUCTION TO COMMUNICATION SYSTEMS**

1	a)	Define Communication and draw the basic block diagram of communication system.	[L1][CO1]	[4M]
	b)	Explain the function of each block of communication system.	[L2][CO1]	[8M]
2	a)	Define wired communication and wireless communication.	[L1][CO1]	[5M]
	b)	Compare Analog and Digital communication.	[L4][CO1]	[7M]
3	a)	Define modulation. Classify different types of modulation.	[L1][CO2]	[6M]
	b)	Explain the need for Modulation.	[L2][CO2]	[6M]
4	a)	Define Amplitude Modulation. Derive expression for AM wave.	[L1][CO3]	[7M]
	b)	Determine the modulation index of AM, Percentage Modulation and Bandwidth of AM.	[L3][CO3]	[5M]
5	a)	Explain shortly about i) Sidebands ii) Justify the reason for selecting the DSB-SC over DSB FC.	[L3][CO3]	[4M]
	b)	A modulating signal $10 \cos(2\pi \times 10^3 t)$ is used to modulate a carrier signal $20 \cos(2\pi \times 10^4 t)$ . Compute the modulation index, % of modulation index, frequency of sideband components and their amplitudes. What will be the bandwidth of modulated signal?	[L3][CO3]	[8M]
6	a)	Illustrate the Amplitude modulation for single tone information.	[L2][CO2]	[6M]
	b)	Discuss the advantages and disadvantages of DSB-SC.	[L1][CO2]	[6M]
7	a)	What is DSB-SC Modulation? Explain the Time and Frequency domain expressions of DSB-SC wave.	[L1][CO3]	[6M]
	b)	Define demodulation. Explain any one amplitude demodulation technique	[L1][CO3]	[4M]
8	a)	Explain single tone modulation for transmitting only upper side band (USB) frequency of SSB modulation	[L2][CO3]	[6M]
	b)	Explain briefly about the various applications of SSB-SC.	[L2][CO3]	[6M]
9	a)	Explain single tone modulation for transmitting only lower side band (LSB) frequency of SSB modulation.	[L2][CO3]	[7M]
	b)	What are the advantages and disadvantages of SSB-SC signal?	[L1][CO3]	[5M]
10	a)	Comparison of Amplitude modulation techniques.	[L4][CO3]	[6M]
	b)	List the advantages and disadvantages of Double side-band Full carrier.	[L1][CO1]	[6M]

**UNIT- II**  
**Angle Modulation & Demodulation**

<b>1</b>	a)	Define angle modulation. Classify different types of angle modulation and advantages of Angle modulation.	[L1][CO1]	[6M]
	b)	Analyze the expression of single tone NBFM.	[L4][CO3]	[6M]
<b>2</b>	a)	Define Frequency Modulation with necessary waveforms.	[L1][CO2]	[6M]
	b)	Derive the expression of Frequency modulation.	[L3][CO3]	[6M]
<b>3</b>	a)	Explain the generation of NBFM and WBFM.	[L2][CO2]	[6M]
	b)	What are the advantages, disadvantages, and applications of FM.	[L1][CO2]	[6M]
<b>4</b>	a)	Explain the generation of FM using direct method.	[L2][CO2]	[6M]
	b)	What are the differences between NBFM and WBFM?	[L1][CO3]	[6M]
<b>5</b>	a)	Classify Frequency modulation techniques.	[L4][CO2]	[6M]
	b)	Explain the generation of Narrowband FM wave.	[L2][CO3]	[6M]
<b>6</b>	a)	Discuss about transmission bandwidth and Carson's rule of FM signal.	[L2][CO2]	[6M]
	b)	A 20 MHz carrier is frequency modulated by a sinusoidal signal such that the peak frequency deviation is 100 kHz. Determine the modulation index and the approximate bandwidth of the FM signal if the frequency of the modulating signal is: (i) 1kHz (ii) 15 kHz	[L3][CO3]	[6M]
<b>7</b>	a)	Differentiate between the Amplitude Modulation and Frequency Modulation	[L2][CO3]	[6M]
	b)	Describe the construction and functionality of balanced slope detector.	[L1][CO2]	[6M]
<b>8</b>	a)	Describe the functionality of each block of phase shift discriminator.	[L2][CO2]	[6M]
	b)	Explain the block diagram of indirect method in FM generation.	[L2][CO2]	[6M]
<b>9</b>	a)	Explain briefly about Phase Modulation with necessary waveforms.	[L2][CO2]	[6M]
	b)	Derive the expression of modulation index of Phase modulation	[L3][CO2]	[6M]
<b>10</b>	a)	Compare Phase Modulation and Frequency Modulation.	[L4][CO3]	[6M]
	b)	Differentiate between the Frequency Modulation and Phase Modulation with its modulated waveforms.	[L2][CO2]	[6M]

**UNIT III**  
**Noise in Communication Systems**

<b>1</b>	a)	Define Noise and list the different types of noises.	[L2][CO1]	[6M]
	b)	Explain briefly about Noise in communication system.	[L1][CO1]	[6M]
<b>2</b>	a)	Explain noise figure and derive its expression.	[L2][CO1]	[6M]
	b)	A mixer stage has a noise figure of 20 dB and it is preceded by another amplifier with a noise figure of 9 dB and an available power gain of 15 dB. Calculate the overall noise figure referred to the input.	[L3][CO1]	[6M]
<b>3</b>	a)	Explain briefly about Signal to Noise Ratio.	[L2][CO1]	[6M]
	b)	Calculate the input signal to noise ratio for an amplifier with an output signal to noise ratio of 16 dB and a noise figure of 5.4 dB	[L4][CO1]	[6M]
<b>4</b>	a)	Explain Pulse Amplitude modulation with its waveforms.	[L2][CO3]	[6M]
	b)	Explain the process of demodulation of a PAM signals.	[L2][CO1]	[6M]
<b>5</b>	a)	What are the advantages and disadvantages of PAM signal.	[L1][CO3]	[6M]
	b)	Define Pulse Width Modulation and classify it with proper diagram.	[L1][CO3]	[6M]
<b>6</b>	a)	Explain the process involved in generation of PWM wave.	[L2][CO3]	[6M]
	b)	Describe the demodulation technique of PWM signal.	[L1][CO4]	[6M]
<b>7</b>	a)	What are the advantages and disadvantages of PWM signal?	[L1][CO4]	[6M]
	b)	Differentiate between the Pulse Amplitude Modulation and Pulse Width Modulation with its modulated waveforms.	[L2][CO4]	[6M]
<b>8</b>	a)	Explain about the generation of PPM signal.	[L2][CO4]	[6M]
	b)	Elaborate demodulation of PPM signal.	[L1][CO3]	[6M]
<b>9</b>	a)	What are the advantages and disadvantages of PPM signal	[L1][CO4]	[6M]
	b)	Differentiate between the Pulse Position Modulation and Pulse Width Modulation with its modulated waveforms.	[L2][CO3]	[6M]
<b>10</b>	a)	Define pulse modulation and different types of pulse modulation in analog and digital communication.	[L4][CO4]	[6M]
	b)	Compare PAM, PWM and PPM techniques.	[L4][CO4]	[6M]

**UNIT-IV**  
**Digital Communication**

1	a)	Define Digital Communication and draw the basic block diagram of Digital communication system.	[L1][CO4]	[5M]
	b)	Explain the function of each block of Digital communication system.	[L2][CO1]	[7M]
2	a)	Explain the Process of Quantization with suitable example.	[L2][CO5]	[6M]
	b)	Discuss the different types of Quantization in detail.	[L2][CO5]	[6M]
3	a)	Illustrate the different types of Quantization noise.	[L2][CO5]	[6M]
	b)	State sampling theorem. What is Nyquist rate and Nyquist interval?	[L1][CO1]	[6M]
4	a)	Illustrate with a neat block diagram explain PCM transmitter and receiver.	[L3][CO4]	[6M]
	b)	What are the advantages & disadvantages of PCM?	[L1][CO4]	[6M]
5	a)	Explain DPCM system with neat diagram.	[L2][CO4]	[6M]
	b)	What are the advantages & disadvantages of DPCM.	[L1][CO4]	[6M]
6	a)	Explain DM (delta modulation system) with suitable diagrams.	[L2][CO4]	[6M]
	b)	Compare PCM, DPCM, and DM.	[L4][CO4]	[6M]
7	a)	Draw the block diagram of ASK modulator and demodulator and explain the operation	[L1][CO6]	[6M]
	b)	Explain with suitable waveforms Amplitude Shift Keying.	[L2][CO6]	[6M]
8	a)	Explain the Binary Frequency shift keying in detail.	[L2][CO6]	[6M]
	b)	Explain with suitable waveforms Binary Frequency Shift Keying.	[L2][CO6]	[6M]
9	a)	Explain the Binary Phase Shift Keying modulator and demodulator	[L2][CO6]	[6M]
	b)	Explain with suitable waveforms Binary Phase Shift Keying.	[L2][CO6]	[6M]
10	a)	Explain Slope overload distortion & Granular Noise.	[L2][CO5]	[6M]
	b)	Compare ASK, FSK, and PSK.	[L4][CO6]	[6M]

**UNIT-V**  
**Introduction to Wireless Communication Systems**

<b>1</b>	a)	Discuss briefly about the evolution of Mobile radio communication.	[L2][CO1]	[6M]
	b)	Explain second generation (2G) cellular networks.	[L2][CO1]	[6M]
<b>2</b>	a)	Explain cordless telephone systems.	[L2][CO1]	[6M]
	b)	Explain paging systems.	[L2][CO1]	[6M]
<b>3</b>	a)	Explain cellular telephone system.	[L2][CO5]	[6M]
	b)	Discuss about frequency division duplexing in wireless communication.	[L2][CO6]	[6M]
<b>4</b>	a)	Explain third generation (3G) wireless networks.	[L2][CO1]	[4M]
	b)	A spectrum of 30 MHz of bandwidth is allocated to a particular FDD cellular telephone system which uses two 25 kHz simplex channels to provide full duplex voice and control channels, compute the number of channels available per cell if a system uses (i) four-cell reuse, (ii) seven-cell reuse, and (iii) 12-cell reuse. If 1 MHz of the allocated spectrum is dedicated to control channels, determine an equitable distribution of control channels and voice channels in each cell for each of the three systems.	[L3][CO6]	[8M]
<b>5</b>	a)	Explain the multiple access schemes for narrowband systems.	[L2][CO1]	[6M]
	b)	Discuss about time division duplexing in wireless communication.	[L2][CO6]	[6M]
<b>6</b>	a)	Explain the multiple access schemes for wideband systems.	[L2][CO6]	[6M]
	b)	Draw the TDMA frame structure and briefly explain the fields.	[L1][CO6]	[6M]
<b>7</b>	a)	Describe the features of the frequency division multiple access (FDMA) scheme.	[L1][CO6]	[6M]
	b)	Describe the features of code division multiple access (CDMA) scheme.	[L1][CO6]	[6M]
<b>8</b>	a)	Describe the features of time division multiple access (TDMA) scheme.	[L1][CO6]	[6M]
	b)	Evaluate the efficiency of time division multiple access (TDMA) scheme.	[L4][CO6]	[6M]
<b>9</b>	a)	Differentiate FDMA,TDMA and CDMA.	[L2][CO6]	[6M]
	b)	Illustrate with a timing diagram how call initiated by a mobile user is established.	[L3][CO6]	[6M]
<b>10</b>	a)	Explain various hybrid spread spectrum techniques in CDMA.	[L2][CO6]	[6M]
	b)	Describe space division multiple access (SDMA) scheme.	[L1][CO6]	[6M]

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