Code No: **R204104T** **R20** **Set No. 1**

IV B.Tech I Semester Regular Examinations, January - 2024

PRINCIPLES OF COMMUNICATIONS

(Common to All Branches except ECE)

Time: 3 hours **Max. Marks: 70**

Answer any FIVE Questions
ONE Question from Each unit
All Questions Carry Equal Marks

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UNIT - I

1	a)	Illustrate the time domain description of Amplitude Modulation.	[7]
	b)	Explain the concept of COSTAS receiver.	[7]
		(OR)	
2	a)	Describe the process of Frequency Translation.	[7]
	b)	Elucidate the VSB transmission of Analog Television.	[7]

UNIT - II

3	a)	Distinguish Narrow Band and Wide Band FM.	[7]
	b)	Obtain the expression for an FM signal with a carrier $(t) = 4(2\pi 106\ t)$ and message signal $(t) = 8c(2\pi 103\ t)$. Determine the power of the FM signal when the frequency sensitivity is 1kHz/Volt.	[7]
		(OR)	
4	a)	Summarize the process involved in the generation of narrow band frequency modulation (NBFM) with necessary block diagram.	[7]
	b)	Interpret the demodulation procedure of FM signal.	[7]

UNIT - III

5	a)	Explicate the generation of Pulse Width Modulation.	[7]
	b)	Illustrate the Sampling, Quantization and Encoding in Digital Modulation.	[7]
		(OR)	
6	a)	With a neat block diagram describe theprocess of Pulse Code Modulation.	[7]
	b)	Explicit the generation and detection of Delta Modulation.	[7]

UNIT - IV

7	a)	Discuss the base band signal receiver model with neat block diagram.	[7]
	b)	Evaluate the figure of merit of a DSB-SC receiver.	[7]
		(OR)	
8	a)	What is capture effect and threshold effect in FM. Explain the measures to overcome them.	[7]
	b)	Illustrate the concepts of Pre-emphasis and De-emphasis in FM.	[7]

UNIT - V

9	a)	Describe the digital codes used for data transmission in communication.	[7]
	b)	Explain the various principles of Digital Transmission in detail.	[7]
		(OR)	
10	a)	Discuss the process of Frequency Shift Keying in Digital Communication.	[7]
	b)	Provide the steps for error detection and correction during communication.	[7]

Code No: **R204104T** **R20** **Set No. 2**

IV B.Tech I Semester Regular Examinations, January – 2024

PRINCIPLES OF COMMUNICATIONS

(Common to All Branches except ECE)

Time: 3 hours **Max. Marks: 70**

Answer any FIVE Questions
ONE Question from Each unit
All Questions Carry Equal Marks

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UNIT - I

1	a)	Illustrate the frequency domain description of Amplitude Modulation.	[7]
	b)	Explain the concept of switching modulator with neat block diagram.	[7]
		(OR)	
2	a)	Describe the process of Quadrature Carrier Multiplexing.	[7]
	b)	Elucidate the concept of Frequency Division Multiplexing.	[7]

UNIT - II

3	a)	Explicate the process and transmission bandwidth of Frequency Modulation.	[7]
	b)	Obtain the (i) Carrier Amplitude (ii) Message signal Amplitude (iii) Carrier Frequency (iv) Message signal frequency for the given FM signal $s(t) = 5cos(2\pi 106\, t + 0.5sin6000\pi t)$. Assume frequency sensitivity as 10 kHz/V.	[7]
		(OR)	
4	a)	Interpret the direct generation procedure of FM signal.	[7]
	b)	Explain the balanced slope detector method for FM demodulation.	[7]

UNIT - III

5	a)	Distinguish the Analog Pulse Modulation techniques.	[7]
	b)	Give detailed description on Sampling and Quantization.	[7]
		(OR)	
6	a)	Explicit the Data Conversion techniques in Digital Communication.	[7]
	b)	Compare Pulse Code Modulation and Delta Modulation in all aspects.	[7]

UNIT - IV

7	a)	Discuss the optimum receiver model with neat block diagram.	[7]
	b)	Derive the figure of merit of AM receiver.	[7]
		(OR)	
8	a)	What is capture effect and threshold effect in FM. Explain the measures to overcome the constraints.	[7]
	b)	Analyze the effect of noise in FM receivers and also obtain the equations for output signal to noise ratio and figure of merit.	[7]

UNIT - V

9	a)	Explain the transmission of binary data in communication system through the digital codes.	[7]
	b)	How do we measure transmission efficiency in data communication?	[7]
		(OR)	
10	a)	Describe the process of Phase Shift Keying in Digital Communication.	[7]
	b)	What is the difference between error detection and error correction? And explain any two error detection methods.	[7]

Code No: **R204104T** **R20** **Set No. 3**

IV B.Tech I Semester Regular Examinations, January – 2024

PRINCIPLES OF COMMUNICATIONS

(Common to All Branches except ECE)

Time: 3 hours **Max. Marks: 70**

Answer any FIVE Questions
ONE Question from Each unit
All Questions Carry Equal Marks
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UNIT - I

1	a)	Illustrate the concept of Envelope detector.	[7]
	b)	Explain the time and frequency domain description of DSBSC Modulation.	[7]
		(OR)	
2	a)	Distinguish SSB and VSB modulation.	[7]
	b)	Elucidate the concept of VSB transmission of Digital Television.	[7]

UNIT - II

3	a)	Explicate the process of FM and classify Narrow and Wide Band FM.	[7]
	b)	Obtain the (i) Bandwidth (ii) Power required, for the given FM signal $(t) = 10(4\pi 106\ t + 5sin4000\pi t)$.	[7]
		(OR)	
4	a)	Discuss about Armstrong method for generation of frequency modulated (FM) signal generation.	[7]
	b)	Interpret the detection procedure of FM signal.	[7]

UNIT - III

5	a)	Explicit the process of Ideal Sampling. Also explain its drawbacks.	[7]
	b)	Describe the generation process of Pulse Position Modulation.	[7]
		(OR)	
6	a)	Discuss the concepts of Sampling, Quantization and Encoding.	[7]
	b)	Give detailed description on Parallel and Serial Transmission techniques.	[7]

UNIT - IV

7	a)	Discuss the receiver model for analysis of noise in analog communication	[7]
	b)	Explain the concept of capture effect in analog modulation.	[7]
		(OR)	
8	a)	Illustrate the importance of threshold effect in noise analysis.	[7]
	b)	Analyze the effect of noise in FM receiver and obtain input and output SNRs.	[7]

UNIT - V

9	a)	Discuss the various digital codes used for data transmission.	[7]
	b)	Define transmission efficiency and list the principles of digital signal transmission in detail.	[7]
		(OR)	
10	a)	Illustrate the concept of BPSK.	[7]
	b)	Explain the channel coding techniques for error detection and correction during signal transmission.	[7]

Code No: **R204104T** **R20** **Set No. 4**

IV B.Tech I Semester Regular Examinations, January – 2024

PRINCIPLES OF COMMUNICATIONS

(Common to All Branches except ECE)

Time: 3 hours **Max. Marks: 70**

Answer any FIVE Questions
ONE Question from Each unit
All Questions Carry Equal Marks

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UNIT - I

1 a) Define Amplitude modulation and explain the time-domain and frequency-domain representation of AM signal. [7]
b) Outline the process of demodulating the double side band suppressed carrier amplitude modulation (DSBSC-AM) using coherent detection. [7]

(OR)

2 a) Illustrate the significance of Frequency translation in Analog Communication. [7]
b) Discuss the concept of Quadrature Carrier Multiplexing. [7]

UNIT - II

3 a) Explicate the process of FM and classify Narrow and Wide Band FM. [7]
b) Estimate the total power as well as bandwidth of an FM signal $(t) = 5\ (4\pi 106\ t + 4\ sin\ 2500\pi t)$. Also obtain the message and carrier frequencies. [7]

(OR)

4 a) With a neat block diagram, elaborate on the generation of frequency modulation (FM) using indirect method. [7]
b) Interpret the concept of FM Stereo Multiplexing. [7]

UNIT - III

5 a) Explicit the concepts of Sampling and Quantization in detail. [7]
b) Describe the generation and detection process of Pulse Amplitude Modulation. [7]

(OR)

6 a) Discuss the process of serial and parallel transmission. [7]
b) Give detailed description on generation and detection of Delta Modulation. [7]

UNIT - IV

7 a) Discuss the base band signal receiver model for noise analysis in analog communication. [7]
b) Derive the figure of merit of AM receiver. [7]

(OR)

8 a) Illustrate the importance of threshold effect in noise analysis. [7]
b) Demonstrate the difference between the noise in AM and FM receivers. [7]

UNIT - V

9 a) Discuss the various digital codes used for binary data transmission. [7]
b) Outline transmission efficiency and list the principles of transmission in detail. [7]

(OR)

10 a) Illustrate the concept of MODEM in communication. [7]
b) Explain the concept of Phase Shift Keying. Also list its advantages. [7]