M - SCHEME DETAILED SYLLABUS

34071 DIGITAL COMMUNICATION

UNIT I BASICS OF DIGITAL COMMUNICATION

Digital communication signal processing – Typical Block diagram and transformations - Advantages over analog communication – Channels for Digital communication- Telephone, Optical fiber, Satellite.

Classification of signals- deterministic and random signals - periodic and non-periodic signals – analog and discrete signals - energy and power signals - unit impulse function

Information capacity (Definition only) – Shannon's limit for information capacity (Definition only) - Data transmission - Serial and parralleltransmission - Synchronous and asynchronous transmission.

UNIT II FORMATTING AND BASE BAND MODULATION

Base band system - The Sampling Theorem –impulse sampling- natural sampling- sample and hold operation - Spectra- Nyquist Theorem - Aliasing – signal interface for a digital system – sampling and quantizing effects- Quantization noise – channel effects – channel noise – PCM - Uniform and Non-uniform Quantization,

Baseband transmission

PCM waveform types- non return-to-zero(NRZ)- return-to-zero (RZ)- phase encoded – multilevel binary – spectral attributes of PCM waveforms – Bits per PCM word and Bits per symbol- PCM word size - M-ary pulse modulation waveforms.

UNIT III BASEBAND CODING TECHNIQUES

Rationale for coding – Types of codes – Discrete memory less channel – Error control coding methods – forward error correction – error detection with retransmission – types of errors – random error and burst error – Principles of linear block codes – Hamming code – Binary cyclic codes – Cyclic redundancy check code (CRC) – Convolution code.

UNIT IV DIGITAL MODULATION TECHNIQUES

Digital modulation techniques – Listing of various types – Coherent binary modulation techniques – Coherent quadrature modulation techniques – Non Coherent binary modulation techniques - Minimum shift keying (MSK) -Block diagram of MSK transmitter and receiver - TDM-Frame structure, ASCII framing- E1

Framing, T1 Framing for telephone.Detection of signals – coherent detection of PSK – sampled matched filter – coherent detection of FSK – Non-coherent detection - Binary differential PSK.

UNIT V SPREAD SPECTRUM TECHNIQUES

Spread spectrum communication - Beneficial attributes of spread spectrum systems – Pseudo noise sequences – Randomness properties – Balance property, Run property and Correlation property - Direct sequence spread spectrum systems – Processing gain and performance – Frequency hopping systems – Frequency hopping with diversity – fast hopping versus slow hopping – Synchronization – Jamming consideration – Commercial application – CDMA Digital cellular system.

REFERENCE BOOKS

1. Digital communications Fundamentals & Applications Bernard Sklar & Pabitra Kumar Ray Pearson -Second edition 2009

2. Digital Communications Simon Haykin John Wiley India edition 2006

3. Digital communication Dr. J.S.Chitode Technical Publications -Pune Second edition, 2011

4 Digital and analog communication system B.P.Lathi .Zhi DingInternational 4th Edition - OXFORD university