PET6I101 DIGITAL COMMUNICATION

MODULE – I (19 HOURS)

Sampling Theorem, Some applications of sampling theorem.

Digital Representation of Analog Signal - Quantization of Signals, Quantization error, PCM, Electrical representation of binary digits, PCM System, Companding (4); Line coding, scrambling, T1 Digital System, Multiplexing T1 lines – The T2, T3 and T4 lines (3); Differential PCM- Linear predicted design, Delta Modulation, and Adaptive Delta Modulation.

Noise in PCM and DM - Calculation of Quantization Noise, Output Signal Power, Thermal Noise, Output SNR in PCM, Quantization noise in Delta Modulation, output signal power, output SNR, Comparison with PCM and DM.

MODULE – II (7 HOURS)

Digital Modulation Technique- Generation, Transmission, Reception; Spectrum and Geometrical Representation in the Signal Space of BPSK, DPSK, QPSK, QASK, M-ary PSK, BFSK, M-ary FSK, and Minimum Shifting Keying (MSK).

MODULE – III (8 HOURS)

Principle of Digital Data Transmission- Digital Communication Systems – Source, Line coder, Multiplexer, Regenerative repeater; Line Coding- PSD of various line codes, polar signalling, constructing a DC Null in PSD by pulse shaping, On Off signalling, Bipolar signalling; Pulse shaping – ISI and effect, Nyquist first criterion for zero ISI; Scrambling, Digital receiver and regenerative repeaters; Equalizers, Timing extraction, Detection error, Eye Diagram.

MODULE-IV (4 HOURS)

Data Transmission- A base band signal Receiver, Peak signal to RMS noise output voltage ratio, probability of error, optimum threshold, optimum receiver for both base band and pass band: calculation of optimum filter transfer function, optimum filter realization using Matched filter, Probability error of the matched filter, optimum filter realization using correlator.

ADDITIONAL MODULE (TERMINAL EXAMINATION-INTERNAL)

1. **Multiple Access Techniques**- FDMA, TDMA, CDMA, OFDM, MIMO

TEXT BOOKS

1. Modern Digital and Analog Communication Systems, B.P. Lathi, Z Ding and Hari Mohan Gupta , Oxford University Press, New Delhi.2017.
2. Principles of Communication Systems, H Taub, D L Schilling and G Saha, TMH Education Pvt Ltd, 4th Edition 2013.
3. An Introduction to Analog and Digital communications, Simon Haykin, Wiley Publication, 2nd edition, 2007

REFERENCE BOOKS

1. Digital and Analog Communication System, Leon W. Couch-II, Prentice Hall of India, Pearson Education, 6th Edition 2001.
2. Digital and Analog Communication System, K. Sam Shanmugam, Wiley India Pvt. Ltd 2006.
3. Digital Communications – Fundamentals and applications, Bernard Sklar, Pearson education Publication, 2nd Edition, 2009.
4. R N Mutagi, Digital Communication- Theory, Techniques and Applications, Oxford University Press