

**Code No.: ETIT 307**  
**Paper: Digital Communication – I**

**L T C**  
**3 1 4**

**INSTRUCTIONS TO PAPER SETTERS:**

**MAXIMUM MARKS: 75**

1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2. Apart from question no. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks.

**UNIT – I**

Analog-to-Digital Conversion: Sampling theorem, Pulse-Amplitude Modulation, Channel bandwidth for PAM signal, Natural sampling, Flat top sampling, Quantization of signals, Quantization error  
**[No. of Hrs.: 09]**

**UNIT – II**

Pulse-code modulation (PCM), Electrical representation of binary digits, The PCM system, Companding, Multiplexing PCM signals, Differential PCM, Delta modulation, Adaptive delta modulation, Vocoders, Channel Vocoder, Linear Predictive coder.  
**[No. of Hrs.: 10]**

**UNIT – III**

Digital Modulation Techniques: Binary Phase-Shift Keying (BPSK), Differential Phase-Shift Keying, Differentially-Encoded PSK (DEPSK), Quadrature Phase-Shift Keying (QPSK), Quadrature Amplitude Shift Keying (QASK), Binary Frequency-Shift Keying (BFSK), Similarity of BPSK and BFSK, M-ary FSK, Minimum Shift Keying (MSK).  
**[No. of Hrs.: 12]**

**UNIT – IV**

Data Transmission: A base band signal receiver, Probability of error, The Optimum Filter, Matched Filter, Probability of error in Matched filter, Coherent reception, Coherent reception of PSK and FSK, Non-Coherent reception of FSK, PSK and QPSK, Calculation of error probability of BPSK and BFSK, Error probability for QPSK] Bit-by-bit encoding versus Symbol-by-Symbol encoding, Relationship between Bit error rate and Symbol Error rate and comparison of modulation systems.  
**[No. of Hrs.: 13]**

**TEXT BOOKS:**

1. Taub and Schilling, “Principles of Communication Systems”, TMH, IInd Edition, 1999.
2. S. Haykin, “Digital Communication”, Wiley, 2000.
3. S. Haykin, “Analog and Digital Communication”, Wiley, 1998.

**REFERENCE BOOKS:**

1. T M Gover, J M Thomos, “Elements of Information Theory”, Wiley, 1999.
2. J G Proakis, “Digital Communications”, Mc Graw Hill, 2001.