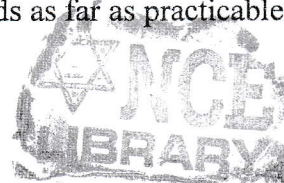


TRIBHUVAN UNIVERSITY
INSTITUTE OF ENGINEERING
Examination Control Division
2076 Chaitra

Exam.	Regular		
Level	BE	Full Marks	80
Programme	BCT	Pass Marks	32
Year / Part	III / I	Time	3 hrs.

Subject: - Data Communication (CT 602)

- ✓ Candidates are required to give their answers in their own words as far as practicable.
- ✓ Attempt All questions.
- ✓ The figures in the margin indicate Full Marks.
- ✓ Assume suitable data if necessary.



1. Draw a generic block diagram of a digital communication system used in mobile telephony and explain each block. Compare analog and digital communication system with examples. [6+2]
2. Explain the properties of causal, non-causal and anticausal systems with example. [10]
3. Explain why we need Fourier Transform. Plot the line spectrums of $X(t) = 12 + 6\sin(140\pi t + 30^\circ) - 9\cos(80\pi t - 70^\circ)$. [5+5]
4. Why we need Modulation? Illustrate an example of a 4-bit PCM with AMI encodes. [2+6]
5. Demonstrate how CRC-5 works to detect errors in data communication. [8]
6. What is multiplexing? Compare synchronous and statistical TDM. Describe Frequency hopping spread spectrum and direct sequence spread spectrum with its block diagram. [2+4+4]
7. Construct a (7, 4) Hamming code using a 4×4 generation matrix for any arbitrary message. [8]
8. Encode "Phool ko aankhama phoolai sansara" using Huffman encoder and find the transmission efficiency. [10]
9. Write short notes on: (Any two) [4×2]
 - a) STP versus UTP
 - b) Frame relay
 - c) 16-Quadrature amplitude modulation
 - d) Multi mode optical fiber
