

TRIBHUVAN UNIVERSITY
INSTITUTE OF ENGINEERING
Examination Control Division
2075 Chaitra

Exam.	Regular / Back	
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. Sketch a generic block diagram of digital data communication system for full duplex mode. [8]
2. Distinguish between power and energy signals with examples. [8]
3. State the condition for the stability of LTI system. Test the stability of the system whose impulse response is $h(t)=te^{-3t}u(t)$ [8]
4. List digital- to-digital line encoding techniques and explain in detail Bipolar 8-zero substitution and High Density 3-zero substitution techniques. [2+4+4]
5. With suitable mathematical expression, explain double-tone AM technique. [8]
6. Demonstrate how CRC-4 works to trace two burst errors. [10]
7. Differentiate between digital and analog spread spectrum techniques using examples. [8]
8. Define entropy in information theory. Find the efficient code word and efficiency using Hoffman algorithm using probabilities $p(x_1)=0.6$, $p(x_2)=0.2$, $p(x_3)=0.1$, $p(x_4)=0.05$, $p(x_5)=0.05$. [8]
9. Explain why channel coding is required in data communication. Generate a convolution code for a input bit streams of (111011) using a c(3,1,3) architecture. [2+10]
