B. Tech.

(SEM. VI) EXAMINATION, 2006-07

DATA ACQUISITION & TELEMETRY

Time : 2 Hours] [Total Marks : 50

Note : Attempt all questions.

1  Attempt any three parts of the following : 5x3=15
   (a) What is Nyquist rate? How does it aid in deciding the min. sampling rate?
   (b) How do the Anti-Aliasing filters work? Describe with the help of a schematic diagram.
   (c) Illustrate at least one method each of Data Error Detection and Error Correction.
   (d) Explain PSK and QPSK. Compare and describe, how is it used to transmit binary data?

2  Attempt any three parts of the following : 5x3=15
   (a) For a frequency range from 100 Hz to 10 kHz, determine the sample rates required to reconstruct a sine wave to 0.1%, 1% and 10% error.
   (b) Discuss at least three prominent errors that a digital computer can input to a continuous system for the measurement instrumentation.

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(c) What are bit-interleaved multiplexers? Justify the bit stuffing process M12 frame by giving one example.

(d) How is Bit and Frame synchronization achieved in Data transmission and reception system? Discuss in brief.

3 Attempt any two of the following: \(5\times2=10\)
   (a) What is word format and frame format? How is this multiplexed? Introduce in brief.
   (b) Describe the ON/OFF commands and Data commands as used in process control systems.
   (c) Introduce some of the interfacing and bus standards accepted internationally? What are its advantages?

4 Write short notes on any two of the following: \(5\times2=10\)
   (a) DPCM
   (b) Data loggers
   (c) Communication based processing control systems.