

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 3098

Roll No.

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B.Tech.

(SEM VI) EVEN SEMESTER THEORY EXAMINATION,
2009-2010

DATA ACQUISITION AND TELEMETRY

Time : 3 Hours

Total Marks : 100

Note : Attempt ALL questions.

1. Attempt any four parts of the following : (4x5=20)
 - (a) Draw the sketches of a voltage and current telemetry schemes using wires.
 - (b) Sketch a Frequency Transmitter Circuit as used in Frequency Telemetry System and explain its operation. Deduce the relation between output frequency and input voltage.
 - (c) Draw the block diagram of a complete telemetry scheme using frequency division multiplexing and demultiplexing.
 - (d) Enlist the telemetry standards of base band configuration in terms of frequency as stipulated by IRIG.
 - (e) How can FM be obtained via phase modulator ?
 - (f) Explain the phase locked loop with the help of neat sketches.

2. Attempt any two of the following :

- (a) Draw the block schematic diagram of TDM/PCM/FM system of telemetering and make appropriate labels both on the transmitting and receiving sides. Compare TDM system with FDM system in a tabular form. 3+4+3=10
- (b) How are PCM signals generated? Sketch a scheme to generate flat top PAM pulses. How the flat - top pulses are used for PCM coding ? 4+3+3=10
- (c) What is the advantage of a differential PCM (DPCM) system? Sketch the block diagram of such a system both on the transmitter and receiver sides. 3+4+3=10

3. Attempt any two of the following :

- (a) Explain, through block diagram and proper explanation data transmission and reception processes as carried out by modems in a complete telemetry system. 10
- (b) Describe a Quadrature Amplitude Modulation (QAM) and demodulation system. Draw the constellation diagram of 8 QAM system. 8+2=10
- (c) Describe synchronous and X modem protocols used in modem systems. 5+5=10

4. Attempt any two of the following :

- (a) Draw the block schematic diagram of a phase modulated FM Transmitter indicating different components required in it. 10
- (b) What are the major considerations in coupling the transmitting antenna to the amplifier stages ? Discuss the interstage coupling circuits with appropriate diagram. 10
- (c) Explain power gain and directivity of an antenna. What do you mean by isotropic radiator ? If the power radiated by an antenna of length 1 cm is 1 W and the radiation wavelength is 12 m. Calculate the current generated in the dipole. 2+2+2+4=10

5. Attempt any two parts of the following :

- (a) Draw the polynomial filter characteristic and explain the comparison of characteristic of different filters. 3+7=10
- (b) What are the different subsystems in satellite stations? Explain the functioning of TT and C subsystems of a satellite communication system. 4+6=10
- (c) How would you proceed to configure a DAS? Discuss with emphasis on the choice of signal conditioning, multiplexing, sampling rate and conversion techniques. 4+6=10