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

PAPER ID : 3098 Roll No. | | | | | | | | | | |

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 Telemetering 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
