Paper Code: EIC 702	Roll No.									

B.Tech.
(SEM VII) ODD SEMESTER EXAMINATION2015-16
Telemetry Systems

[Time: 3 hrs.] **[Max. Marks: 100]**

Note- ***Attempt All Questions. All Questions carry equal marks*:-**

1. **Attempt any FOUR of the following questions:**
   (a) Sketch a complete frequency telemetry scheme including the details in transmitting and receiving sides? What are the problems faced with transmitting channel?
   (b) How is voltage converted to current for use in telemetering system? Explain with suitable diagram.
   (c) Distinguish between a three line and two line electrical type transmitter. Which one is more popular in industry and why?
   (d) Explain and draw the circuit diagram of a frequency meter that is used for analogue indication of telemetered data.
   (e) Discuss power line communication used in industry measurement and high frequency range.
   (f) What is window comparator? Design a window comparator with two OA's and AND gate.

2. **Attempt any TWO of the following questions:**
   (a) Draw the block diagram of a complete telemetry scheme using frequency division multiplexing and demultiplexing using the FM system. What are the advantages of an FM-FM system and what are their demerits?
   (b) What is meant by channel synchronization and how is line coding made to provide this facility? Explain the operation of blank pulse channel synchronization technique with suitable diagram and waveforms.
   (c) Sketch and explain a scheme to generate flat top PAM pulses. If the number of quantization levels in a liner A/D convertor is n and V_{LSB} is the least converted voltage then show that rms output signal voltage is $V_{rms} = (1/\sqrt{2})\,(2^n/2)\,V_{LSB}$ and quantization error is $V_{LSB}/\sqrt{12}$.

3. **Attempt any TWO of the following questions:**
   (a) What are simplex and duplex types of modems? What is the standard bandwidth adopted in the telemetry data communication system using modems? What channels are used for these systems? How do you propose to utilize the bandwidth for a duplex system?

(b) What is differential phase shift keying? Why it is adopted in digital data transmission? Show by proper diagrams and arrays, if necessary how differential encoding and decoding are done.

(c) Describe and explain data transmission/reception process as carried out by modems in a complete telemetry system. Describe synchronous and X-modem protocols used in modem systems.

4. Attempt any TWO of the following questions:

(a) Describe the Armstrong method of FM telemetry system. How is large frequency deviation in FM system achieved through the FM transmitter?

(b) Explain with diagrams how parabolic (dish) antennas are 'fed' and 'extracted'. What is special about such antennas? What is multipoint beamwidth in a dish antenna? Where it is used mostly?

(c) Explain with diagram how electric and magnetic fields are generated by an antenna. What is the configuration of an ideal antenna? Why do actual antenna differ from this configuration? Calculate the power radiated from an idealized antenna at a distance of 10 m when it has a generated field of 1 V/m with radiating power of 1 W.

5. Attempt any TWO of the following questions:

(a) What specific units are to be there to form a remote control system? How it is different from a telemetry system? Describe briefly the operation of a generalized remote control system.

(b) Where are the zeroes of a Butterworth polynomial located in S-plane? Show that roots of a low-pass Chebyshev filter lie on an ellipse.

(c) What are the different types of transponder? Why are different frequencies used on the transmitting and receiving sides of transponder? How is the change effected in a regenerative type of transponder?