

IV B.Tech II Semester Regular Examinations, Apr/May 2006
TELEMETRY AND TELECONTROL
(Common to Electronics & Instrumentation Engineering and Electronics & Control Engineering)

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. Explain Hydraulic Telemetry system and distinguish between Pneumatic & Hydraulic system. [16]
2. Write short notes on:
 - (a) Optical sources.
 - (b) Optical Detectors.
 - (c) Optical fibres for signal transmission. [16]
3. Explain with a neat sketch position Telemetry system using cross-coiled synchros system. [16]
4. Explain the purpose of the device called a “Multiplexer” in the telemetry system. Also explain “Demultiplexer”. [16]
5. Compare PCM, PWM, PPM, Delta modulation with each other and list two advantages & disadvantages of the system. [16]
6. (a) Write in detail about IR detectors.
(b) What is an Avalanche Photodiode. Explain the construction details of the APD with a figure. [8+8]
7. Draw a neat sketch and explain pulse code transmission of Tele control data. Write about the advantages of Electronic PCM system in contrast to elector mechanical PCM system. [16]
8. With a neat sketch, explain cyclic time multiplex. Signal scanning method and cyclic time multiplex with signal sequence switching. [16]

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1. (a) Differentiate Telemetry from communication, information theory, Data processing and Instrumentation.
(b) Give an account of the significance of telemetry stating Telemetering milestones. [8+8]
2. (a) Explain with a sketch how voltage is used to measure pressure in voltage Telemetry system.
(b) Draw the sketch of torque balance Telemetry system and explain with one example. [8+8]
3. With a neat circuit diagram, explain the frequency transmitter used in frequency telemetry system. Give the relation between O/p frequency and I/p voltage. [16]
4. Explain the modulation techniques used in radio telemetry and explain how they help in signal processing. [16]
5. Write short notes on:
 - (a) Group synchronization
 - (b) Word Sync Acquisition
 - (c) Frame Sync Acquisition. [6+5+5]
6. How does energy loss occur in an optical fibre cable? What are the different types of such loss mechanisms? How can they be compensated? [16]
7. Describe with a neat sketch Tele control installation with audio-channel transmission of several signals by frequency echelon. [16]
8. List and briefly explain the environmental and interface conditions of Tele control apparatus. [16]

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1. Draw the sketch of pneumatic Telemetry system and explain. How is fluid line characterized? What is the important parameter in such a system? [16]
2. Define the terms :
(a) Multiplexer
(b) Demultiplexer
and explain their role in Telemetry system. List their advantages. [16]
3. Sketch a frequency transmitter circuit as used in frequency telemetering system and explain the operation. Deduce the relation between output frequency and input voltage. [16]
4. Draw the sketch of low power transmitter and high power transmitter used in radio telemetry and explain. [16]
5. Draw a sketch and explain how radio telemetry is used in the measurement of temperature and motion in internal combustion engine. [16]
6. What is dispersion? Explain the types of dispersion? How does dispersion affect transmission in a fibre? [16]
7. What is meant by digital Tele control method with coding method? Explain about Electro mechanical systems with low and high Tele graph speeds in digital pulse code method. [16]
8. What is meant by remote regulation. Explain about remote regulation with examples. [16]

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1. Draw the sketch of pneumatic Telemetry system and explain. How is fluid line characterized? What is the important parameter in such a system? [16]
2. (a) How is propagation of light supported in a fibre optic cable? What is the critical Angle of incidence and on what factors does it depend?
(b) In a fibre optic cable the refractive indices of the core, cladding and air are 1.49, 1.36 & 1.00 respectively. Calculate the critical angle and numerical aperture. [8+8]
3. With neat sketch explain the basic concept of position telemetering system using
(a) a bridge type configuration.
(b) Synchros [16]
4. Why are superheterodyne receivers preferred to over others in FM/FM or PCM transmission systems? Draw the schematic block diagram of a superheterodyne receiver and explain its operation. [16]
5. (a) Draw the block diagram of digital to digital PCM telemetry and analog to analog PCM telemetry link.
(b) Explain about De-commutator counters. [8+8]
6. (a) What is a multimode graded index fibre and explain about it with necessary figures and equations.
(b) What are single mode fibres and explain them in detail with necessary figures and equations. [8+8]
7. Explain briefly analogue Tele control methods with time variable transmission signal. [16]
8. List and briefly explain the environmental and interface conditions of Tele control apparatus. [16]
