

**R09**

Code: 9A04601

III B. Tech II Semester (R09) Supplementary Examinations, November/December 2012

**DIGITAL COMMUNICATIONS**

(Electronics &amp; Communication Engineering)

Time: 3 hours

Max. Marks: 70

Answer any FIVE questions

All questions carry equal marks

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- 1 (a) State sampling theorem for low pass signals and band pass signals and prove it.  
(b) What do you mean by over sampling?
- 2 (a) Explain about CCITT hierarchy.  
(b) What is meant by bandwidth efficiency of a digital multiplexing system?
- 3 (a) With the help of a block diagram explain baseband binary data transmission system.  
(b) Explain the design and analysis of M-ary signaling schemes. List the waveforms in quaternary schemes.
- 4 (a) Name the quantity that is used as figure of merit in digital communications. How do you compare the above with the figure of merit of the analog communication system?  
(b) Using Nyquist criteria pulses, binary data at a rate of 8 kbps is to be transmitted over a channel of 6 kHz bandwidth. What is the maximum value of the rolloff factor  $p$  that can be used?
- 5 (a) Explain in detail about sequential decoding for convolutional codes.  
(b) Give the advantages and disadvantages of cyclic codes and convolutional codes.
- 6 Derive an expression for the channel capacity of continuous channel in the presence of white Gaussian noise.
- 7 (a) Derive an expression for probability of bit error of a binary coherent FSK receiver.  
(b) Derive an expression for probability of bit error of a binary non-coherent ASK.
- 8 Explain about QPSK in detail with an example and draw the waveforms.

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