

Code No: RR310405

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SET-1

B. Tech III Year I Semester Examinations, December - 2011
DIGITAL COMMUNICATIONS
(ELECTRONICS AND COMMUNICATIONS ENGINEERING)

Time: 3 hours

Max. Marks: 80

Answer any five questions
All questions carry equal marks

- 1.a) Define Sampling Theorem? Prove the Sampling Theorem for Low Pass signals.
- b) Discuss about Generation & Detection of Pulse Width Modulation (PWM) with neat sketch. [8+8]
- 2.a) Calculate the Nyquist rate & Nyquist Interval for the given Analog Signal
 $X(t) = 3\cos 50\pi t + 10 \sin 300\pi t - \cos 100\pi t$
- b) Compare PAM, PWM & PPM with respect to bandwidth, Noise, Power and discuss merits & demerits. [8+8]
- 3.a) Explain about M-array Signaling Schemes.
- b) Explain about DPSK modulation scheme with suitable examples. [8+8]
- 4.a) What is Quantization Error in PCM System? Derive the Equation for Quantization Noise Power in terms of Step Size?
- b) Consider an Audio Signal is given as $x(t) = 3 \cos (500\pi t)$. Determine
(i) Signal to Quantization Noise ratio when this is quantized using 10 bit PCM
(ii) How many bits of Quantization are needed to achieve a signal to Quantization Noise ratio at least 40 dB? [8+8]
- 5.a) Compare PCM, DM and DPCM?
- b) Explain the Block diagram of Delta Modulation with Suitable Example. [8+8]
- 6.a) Write the Comparisons among Binary Signaling Schemes (ASK, PSK & FSK)
- b) Discuss about QPSK modulation technique with neat block diagram and explain phasor & Constellation diagrams. [6+10]
- 7.a) Distinguish Block codes and Convolution codes.
- b) Design an encoder for a (7, 4) binary cyclic code generated by $g(x) = 1+x+x^3$ and verify its operation using message vector $D = 0101$. [8+8]
8. Discuss about the following
 - a) Companding
 - b) Eye Pattern
 - c) Parity coding
 - d) Inter symbol interference. [16]

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Time: 3 hours

Max. Marks: 80

Answer any five questions
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- 1.a) Explain about M-array Signaling Schemes.
- b) Explain about DPSK modulation scheme with suitable examples. [8+8]

- 2.a) What is Quantization Error in PCM System? Derive the Equation for Quantization Noise Power in terms of Step Size?
- b) Consider an Audio Signal is given as $x(t) = 3 \cos(500\pi t)$. Determine
 - (i) Signal to Quantization Noise ratio when this is quantized using 10 bit PCM
 - (ii) How many bits of Quantization are needed to achieve a signal to Quantization Noise ratio at least 40 dB? [8+8]

- 3.a) Compare PCM, DM and DPCM?
- b) Explain the Block diagram of Delta Modulation with Suitable Example. [8+8]

- 4.a) Write the Comparisons among Binary Signaling Schemes (ASK, PSK & FSK)
- b) Discuss about QPSK modulation technique with neat block diagram and explain phasor & Constellation diagrams. [6+10]

- 5.a) Distinguish Block codes and Convolution codes.
- b) Design an encoder for a (7, 4) binary cyclic code generated by $g(x) = 1+x+x^3$ and verify its operation using message vector $D = 0101$. [8+8]

6. Discuss about the following
 - a) Companding
 - b) Eye Pattern
 - c) Parity coding
 - d) Inter symbol interference. [16]

- 7.a) Define Sampling Theorem? Prove the Sampling Theorem for Low Pass signals.
- b) Discuss about Generation & Detection of Pulse Width Modulation (PWM) with neat sketch. [8+8]

- 8.a) Calculate the Nyquist rate & Nyquist Interval for the given Analog Signal
 $X(t) = 3\cos 50\pi t + 10 \sin 300\pi t - \cos 100\pi t$
- b) Compare PAM, PWM & PPM with respect to bandwidth, Noise, Power and discuss merits & demerits. [8+8]

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Time: 3 hours

Max. Marks: 80

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- 1.a) Compare PCM, DM and DPCM?
b) Explain the Block diagram of Delta Modulation with Suitable Example. [8+8]
- 2.a) Write the Comparisons among Binary Signaling Schemes (ASK, PSK & FSK)
b) Discuss about QPSK modulation technique with neat block diagram and explain phasor & Constellation diagrams. [6+10]
- 3.a) Distinguish Block codes and Convolution codes.
b) Design an encoder for a (7, 4) binary cyclic code generated by $g(x) = 1+x+x^3$ and verify its operation using message vector $D = 0101$. [8+8]
4. Discuss about the following
a) Companding b) Eye Pattern
c) Parity coding d) Inter symbol interference. [16]
- 5.a) Define Sampling Theorem? Prove the Sampling Theorem for Low Pass signals.
b) Discuss about Generation & Detection of Pulse Width Modulation (PWM) with neat sketch. [8+8]
- 6.a) Calculate the Nyquist rate & Nyquist Interval for the given Analog Signal
 $X(t) = 3\cos 50\pi t + 10 \sin 300\pi t - \cos 100\pi t$
b) Compare PAM, PWM & PPM with respect to bandwidth, Noise, Power and discuss merits & demerits. [8+8]
- 7.a) Explain about M-array Signaling Schemes.
b) Explain about DPSK modulation scheme with suitable examples. [8+8]
- 8.a) What is Quantization Error in PCM System? Derive the Equation for Quantization Noise Power in terms of Step Size?
b) Consider an Audio Signal is given as $x(t) = 3 \cos (500\pi t)$. Determine
(i) Signal to Quantization Noise ratio when this is quantized using 10 bit PCM
(ii) How many bits of Quantization are needed to achieve a signal to Quantization Noise ratio at least 40 dB? [8+8]

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Time: 3 hours

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- 1.a) Distinguish Block codes and Convolution codes.
- b) Design an encoder for a (7, 4) binary cyclic code generated by $g(x) = 1+x+x^3$ and verify its operation using message vector $D = 0101$. [8+8]
2. Discuss about the following
 - a) Companding
 - b) Eye Pattern
 - c) Parity coding
 - d) Inter symbol interference. [16]
- 3.a) Define Sampling Theorem? Prove the Sampling Theorem for Low Pass signals.
- b) Discuss about Generation & Detection of Pulse Width Modulation (PWM) with neat sketch. [8+8]
- 4.a) Calculate the Nyquist rate & Nyquist Interval for the given Analog Signal
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- 7.a) Compare PCM, DM and DPCM?
- b) Explain the Block diagram of Delta Modulation with Suitable Example. [8+8]
- 8.a) Write the Comparisons among Binary Signaling Schemes (ASK, PSK & FSK)
- b) Discuss about QPSK modulation technique with neat block diagram and explain phasor & Constellation diagrams. [6+10]

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