

Code No: RR322205

RR

Set No. 2

III B.Tech II Semester Examinations, December 2010

COMMUNICATION SYSTEMS

Instrumentation And Control Engineering

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions

All Questions carry equal marks

1. (a) "Pulse Modulation Systems are not digital, whereas pulse code modulation is" Justify?
(b) What is quantization error? How does it depend upon the step size, suggest some steps to overcome it. [8+8]
2. (a) The rms voltage of a carrier wave is 5Volts before modulation and 5.9Volts after modulation. What is the % of modulation? Calculate the modulated power if the unmodulated power is 2kWatt.
(b) Draw the SSB block diagram, using the single tone modulating signal $\cos(\omega_m t)$, verify that the output of the SSB generator is indeed an SSB signal, and show that an USB or LSB signal results from subtraction or addition at the summation junction. [8+8]
3. (a) $v(t) = \cos \omega_c t + 0.2 \cos \omega_m t \sin \omega_c t$
i. Show that $v(t)$ is a combination AM-FM signal.
ii. Sketch the phasor diagram at $t=0$
(b) A carrier is frequency modulated by a sinusoidal modulating signal of frequency 2KHz resulting in a frequency deviation of 5KHz. What is the bandwidth occupied by the modulated waveform? The amplitude of the modulating sinusoid is increased by a factor of 3 and its frequency lowered to 1KHz. What is the new bandwidth? [10+6]
4. Discuss the advantages and disadvantages of bipolar signaling? [16]
5. (a) State and Prove the Sampling Theorem in Time Domain. [8]
(b) Find the Nyquist rate and Nyquist interval for the following signals.
i. $f(t) = (1/2\pi) \cos(4000\pi t) \cdot \cos(1000\pi t)$
ii. $f(t) = \sin(500\pi t)/\pi t$ [4+4]
6. Write a short notes on electrical, Pneumatic, Hydraulic and Optical Telemetry Systems. [16]
7. (a) A band pass data transmission scheme uses a PSK signaling scheme with
 $s_2(t) = A \cos \omega_c t, 0 < t < T_b, \omega_c = 10\pi/T_b$
 $s_1(t) = -A \cos \omega_c t, 0 < t < T_b, T_b = 0.2\text{msec}$
(b) With a neat block diagram explain about generation and detection of coherent QPSK signals. [8+8]

Code No: RR322205

RR

Set No. 2

8. (a) Explain the probability density function. List its properties.
(b) Give the classical and axiomatic definitions of probability.
(c) List the axioms of the probability.

[8+4+4]

FIRSTRANKER

Code No: RR322205

RR

Set No. 4

III B.Tech II Semester Examinations, December 2010

COMMUNICATION SYSTEMS

Instrumentation And Control Engineering

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions

All Questions carry equal marks

1. (a) Explain the probability density function. List its properties.
 (b) Give the classical and axiomatic definitions of probability.
 (c) List the axioms of the probability. [8+4+4]
2. Discuss the advantages and disadvantages of bipolar signaling? [16]
3. (a) A band pass data transmission scheme uses a PSK signaling scheme with
 $s_2(t) = A \cos \omega_c t$, $0 < t < T_b$, $\omega_c = 10\pi/T_b$
 $s_1(t) = -A \cos \omega_c t$, $0 < t < T_b$, $T_b = 0.2 \text{ msec}$
 (b) With a neat block diagram explain about generation and detection of coherent QPSK signals. [8+8]
4. (a) State and Prove the Sampling Theorem in Time Domain. [8]
 (b) Find the Nyquist rate and Nyquist interval for the following signals.
 i. $f(t) = (1/2\pi) \cos(4000\pi t) \cdot \cos(1000\pi t)$
 ii. $f(t) = \sin(500\pi t)/\pi t$ [4+4]
5. (a) The rms voltage of a carrier wave is 5Volts before modulation and 5.9Volts after modulation. What is the % of modulation? Calculate the modulated power if the unmodulated power is 2kWatt.
 (b) Draw the SSB block diagram, using the single tone modulating signal $\cos(\omega_m t)$, verify that the output of the SSB generator is indeed an SSB signal, and show that an USB or LSB signal results from subtraction or addition at the summation junction. [8+8]
6. (a) $v(t) = \cos \omega_c t + 0.2 \cos \omega_m t \sin \omega_c t$
 i. Show that $v(t)$ is a combination AM-FM signal.
 ii. Sketch the phasor diagram at $t=0$
 (b) A carrier is frequency modulated by a sinusoidal modulating signal of frequency 2KHz resulting in a frequency deviation of 5KHz. What is the bandwidth occupied by the modulated waveform? The amplitude of the modulating sinusoid is increased by a factor of 3 and its frequency lowered to 1KHz. What is the new bandwidth? [10+6]
7. Write a short notes on electrical, Pneumatic, Hydraulic and Optical Telemetry Systems. [16]

Code No: RR322205

RR

Set No. 4

8. (a) "Pulse Modulation Systems are not digital, whereas pulse code modulation is" Justify?
- (b) What is quantization error? How does it depend upon the step size, suggest some steps to overcome it. [8+8]

FIRSTRANKER

Code No: RR322205

RR

Set No. 1

III B.Tech II Semester Examinations, December 2010

COMMUNICATION SYSTEMS

Instrumentation And Control Engineering

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions

All Questions carry equal marks

1. Discuss the advantages and disadvantages of bipolar signaling? [16]
2. (a) "Pulse Modulation Systems are not digital, whereas pulse code modulation is" Justify?
(b) What is quantization error? How does it depend upon the step size, suggest some steps to overcome it. [8+8]
3. (a) State and Prove the Sampling Theorem in Time Domain. [8]
(b) Find the Nyquist rate and Nyquist interval for the following signals.
i. $f(t) = (1/2\pi) \cos(4000\pi t) \cdot \cos(1000\pi t)$
ii. $f(t) = \sin(500\pi t) / \pi t$ [4+4]
4. (a) The rms voltage of a carrier wave is 5Volts before modulation and 5.9Volts after modulation. What is the % of modulation? Calculate the modulated power if the unmodulated power is 2kWatt.
(b) Draw the SSB block diagram, using the single tone modulating signal $\cos(\omega_m t)$, verify that the output of the SSB generator is indeed an SSB signal, and show that an USB or LSB signal results from subtraction or addition at the summation junction. [8+8]
5. (a) $v(t) = \cos \omega_c t + 0.2 \cos \omega_m t \sin \omega_c t$
i. Show that $v(t)$ is a combination AM-FM signal.
ii. Sketch the phasor diagram at $t=0$
(b) A carrier is frequency modulated by a sinusoidal modulating signal of frequency 2KHz resulting in a frequency deviation of 5KHz. What is the bandwidth occupied by the modulated waveform? The amplitude of the modulating sinusoid is increased by a factor of 3 and its frequency lowered to 1KHz. What is the new bandwidth? [10+6]
6. (a) Explain the probability density function. List its properties.
(b) Give the classical and axiomatic definitions of probability.
(c) List the axioms of the probability. [8+4+4]
7. Write a short notes on electrical, Pneumatic, Hydraulic and Optical Telemetry Systems. [16]

Code No: RR322205

RR

Set No. 1

8. (a) A band pass data transmission scheme uses a PSK signaling scheme with
 $s_2(t) = A \cos \omega_c t$, $0 < t < T_b$, $\omega_c = 10\pi/T_b$
 $s_1(t) = -A \cos \omega_c t$, $0 < t < T_b$, $T_b = 0.2 \text{ msec}$
- (b) With a neat block diagram explain about generation and detection of coherent QPSK signals. [8+8]

FIRSTRANKER

Code No: RR322205

RR

Set No. 3

III B.Tech II Semester Examinations, December 2010

COMMUNICATION SYSTEMS

Instrumentation And Control Engineering

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions

All Questions carry equal marks

1. Write a short notes on electrical, Pneumatic, Hydraulic and Optical Telemetry Systems. [16]
2. (a) A band pass data transmission scheme uses a PSK signaling scheme with
 $s_2(t) = A \cos \omega_c t$, $0 < t < T_b$, $\omega_c = 10\pi/T_b$
 $s_1(t) = -A \cos \omega_c t$, $0 < t < T_b$, $T_b = 0.2 \text{ msec}$
 (b) With a neat block diagram explain about generation and detection of coherent QPSK signals. [8+8]
3. (a) Explain the probability density function. List its properties.
 (b) Give the classical and axiomatic definitions of probability.
 (c) List the axioms of the probability. [8+4+4]
4. (a) $v(t) = \cos \omega_c t + 0.2 \cos \omega_m t \sin \omega_c t$
 i. Show that $v(t)$ is a combination AM-FM signal.
 ii. Sketch the phasor diagram at $t=0$
 (b) A carrier is frequency modulated by a sinusoidal modulating signal of frequency 2KHz resulting in a frequency deviation of 5KHz. What is the bandwidth occupied by the modulated waveform? The amplitude of the modulating sinusoid is increased by a factor of 3 and its frequency lowered to 1KHz. What is the new bandwidth? [10+6]
5. (a) State and Prove the Sampling Theorem in Time Domain. [8]
 (b) Find the Nyquist rate and Nyquist interval for the following signals.
 i. $f(t) = (1/2\pi) \cos(4000\pi t) \cos(1000\pi t)$
 ii. $f(t) = \sin(500\pi t)/\pi t$ [4+4]
6. (a) "Pulse Modulation Systems are not digital, whereas pulse code modulation is" Justify?
 (b) What is quantization error? How does it depend upon the step size, suggest some steps to overcome it. [8+8]
7. (a) The rms voltage of a carrier wave is 5Volts before modulation and 5.9Volts after modulation. What is the % of modulation? Calculate the modulated power if the unmodulated power is 2kWatt.

Code No: RR322205

RR

Set No. 3

- (b) Draw the SSB block diagram, using the single tone modulating signal $\cos(\omega_m t)$, verify that the output of the SSB generator is indeed an SSB signal, and show that an USB or LSB signal results from subtraction or addition at the summation junction. [8+8]
8. Discuss the advantages and disadvantages of bipolar signaling? [16]

FIRSTRANKER