Code No: 07A4EC11 | R07 | SET-1

B.Tech II Year II Semester Examinations, April/May-2012
ANALOG COMMUNICATIONS
(Common to Electronics and Telematics, Electronics and Communication Engineering)

Time: 3 hours **Max. Marks: 80**

Answer any five questions
All questions carry equal marks

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1. Draw the block diagram of phase modulated type FM transmitter. Explain the significance of each block. [16]

2. Show that an AM system using synchronous detection does not suffer from the threshold effect. [16]

3. For a balanced ring modulation with f_c = 400 kHz and the modulating signal frequency, f_m from 0 kHz to 4 kHz, determine
   a) output frequency spectrum.
   b) output frequency for a single frequency input, f_m = 1.2 kHz. [16]

4.a) Explain the need of modulation. Mention its advantages.
b) Define amplitude modulation. Describe the basic operation of an AM modulator. [8+8]

5. Discuss about the generation of vestigial sideband modulation. What are its advantages and applications? [16]

6. An Armstrong FM modulator is required in order to transmit an audio signal of bandwidth 50 Hz to 15 kHz. The narrowband (NB) phase modulator used for this purpose utilizes a crystal controlled oscillator to provide a carrier frequency f_{c1} = 0.2 MHz. The output of the NB phase modulator is multiplied by n_1 by a multiplier and passed to a mixer with a local oscillator frequency f_{c2} = 10.925 MHz the desired FM wave at the transmitter output has a carrier frequency f_c = 90 MHz and a frequency deviation of 75 kHz, which is obtained by multiplying the mixer output frequency with n_2 using another multiplier. Find n_1 and n_2. Assume that NBFM produces deviation of 25 Hz for the lowest base band signal. [16]

7.a) What is single polarity and double polarity in PAM?
b) How is TDM different from FDM? Explain. [8+8]

8.a) Sketch a practical diod detector with typical component values and calculate modulation index tolerate without causing negative peak clipping.
b) What are the functions of variable selectivity? How is it achieved in practice? [8+8]

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Code No: 07A4EC11 | R07 | SET-2

B.Tech II Year II Semester Examinations, April/May-2012
ANALOG COMMUNICATIONS
(Common to Electronics and Telematics, Electronics and Communication Engineering)

Time: 3 hours **Max. Marks: 80**

Answer any five questions
All questions carry equal marks
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1. For a balanced ring modulation with f_c = 400 kHz and the modulating signal frequency, f_m from 0 kHz to 4 kHz, determine
   a) output frequency spectrum.
   b) output frequency for a single frequency input, f_m = 1.2 kHz. [16]

2.a) Explain the need of modulation. Mention its advantages.
   b) Define amplitude modulation. Describe the basic operation of an AM modulator. [8+8]

3. Discuss about the generation of vestigial sideband modulation. What are its advantages and applications? [16]

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5.a) What is single polarity and double polarity in PAM?
   b) How is TDM different from FDM? Explain. [8+8]

6.a) Sketch a practical diod detector with typical component values and calculate modulation index tolerate without causing negative peak clipping.
   b) What are the functions of variable selectivity? How is it achieved in practice? [8+8]

7. Draw the block diagram of phase modulated type FM transmitter. Explain the significance of each block. [16]

8. Show that an AM system using synchronous detection does not suffer from the threshold effect. [16]

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Code No: 07A4EC11 | R07 | SET-3

B.Tech II Year II Semester Examinations, April/May-2012
ANALOG COMMUNICATIONS
(Common to Electronics and Telematics, Electronics and Communication Engineering)

Time: 3 hours **Max. Marks: 80**

Answer any five questions
All questions carry equal marks
- - -

1. Discuss about the generation of vestigial sideband modulation. What are its advantages and applications? [16]

2. An Armstrong FM modulator is required in order to transmit an audio signal of bandwidth 50 Hz to 15 kHz. The narrowband (NB) phase modulator used for this purpose utilizes a crystal controlled oscillator to provide a carrier frequency f_{c1} = 0.2 MHz. The output of the NB phase modulator is multiplied by n_1 by a multiplier and passed to a mixer with a local oscillator frequency f_{c2} = 10.925 MHz the desired FM wave at the transmitter output has a carrier frequency f_c = 90 MHz and a frequency deviation of 75 kHz, which is obtained by multiplying the mixer output frequency with n_2 using another multiplier. Find n_1 and n_2. Assume that NBFM produces deviation of 25 Hz for the lowest base band signal. [16]

3.a) What is single polarity and double polarity in PAM?
b) How is TDM different from FDM? Explain. [8+8]

4.a) Sketch a practical diod detector with typical component values and calculate modulation index tolerate without causing negative peak clipping.
b) What are the functions of variable selectivity? How is it achieved in practice? [8+8]

5. Draw the block diagram of phase modulated type FM transmitter. Explain the significance of each block. [16]

6. Show that an AM system using synchronous detection does not suffer from the threshold effect. [16]

7. For a balanced ring modulation with f_c = 400 kHz and the modulating signal frequency, f_m from 0 kHz to 4 kHz, determine
a) output frequency spectrum.
b) output frequency for a single frequency input, f_m = 1.2 kHz. [16]

8.a) Explain the need of modulation. Mention its advantages.
b) Define amplitude modulation. Describe the basic operation of an AM modulator. [8+8]

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Code No: 07A4EC11 | R07 | SET-4

B.Tech II Year II Semester Examinations, April/May-2012
ANALOG COMMUNICATIONS
(Common to Electronics and Telematics, Electronics and Communication Engineering)

Time: 3 hours **Max. Marks: 80**

Answer any five questions
All questions carry equal marks
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1.a) What is single polarity and double polarity in PAM?
b) How is TDM different from FDM? Explain. [8+8]

2.a) Sketch a practical diod detector with typical component values and calculate modulation index tolerate without causing negative peak clipping.
b) What are the functions of variable selectivity? How is it achieved in practice? [8+8]

3. Draw the block diagram of phase modulated type FM transmitter. Explain the significance of each block. [16]

4. Show that an AM system using synchronous detection does not suffer from the threshold effect. [16]

5. For a balanced ring modulation with f_c = 400 kHz and the modulating signal frequency, f_m from 0 kHz to 4 kHz, determine
a) output frequency spectrum.
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7. Discuss about the generation of vestigial sideband modulation. What are its advantages and applications? [16]

8. An Armstrong FM modulator is required in order to transmit an audio signal of bandwidth 50 Hz to 15 kHz. The narrowband (NB) phase modulator used for this purpose utilizes a crystal controlled oscillator to provide a carrier frequency f_{c1} = 0.2 MHz. The output of the NB phase modulator is multiplied by n_1 by a multiplier and passed to a mixer with a local oscillator frequency f_{c2} = 10.925 MHz the desired FM wave at the transmitter output has a carrier frequency f_c = 90 MHz and a frequency deviation of 75 kHz, which is obtained by multiplying the mixer output frequency with n_2 using another multiplier. Find n_1 and n_2. Assume that NBFM produces deviation of 25 Hz for the lowest base band signal. [16]

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