Code No: NR220404 | **NR** | **Set No. 2**

II B.Tech II Semester Examinations,December 2010
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) Explain with the help of sketches and mathematical expressions how VSB modulation can be obtained and mention its applications.

   (b) An AM broadcast station has a modulation index, which is 0.75 on the average. What would be the average power saving if it could go over to SSB-SC transmission, while having to maintain the same signal strength in the reception area?   [16]

2. What is meant by fading? Explain with suitable figures and example. Explain the principle of frequency and space diversity techniques employed to reduce the effect of fading.   [16]

3. (a) Explain the operation of ISB transmitter with block diagram. Where it is used?

   (b) What is the function of crystal filters in SSB transmitter?

   (c) State and explain with respect to 'Q', various types of filters used to separate side bands?   [8+4+4]

4. (a) Distinguish between simple AGC and delayed AGC.

   (b) Draw a block diagram of a superheterodyne receiver and explain the function of each stage.

   (c) What is meant by the term "tracking error"? Explain.   [4+8+4]

5. (a) What signalling facilities are to be provided by subscriber's instrument in an automatic telephone exchange? Show how this is achieved by a schematic diagram.

   (b) What is a transmission bridge? What are its functions? Describe the working of one important type of transmission bridge.   [8+8]

6. (a) Draw the complete block diagram of the Armstrong frequency modulation system and explain the function of the mixer and multipliers. In what circumstances can we dispense with the mixer?

   (b) The equation of an angle-modulated voltage $v(t) = 10 \sin(10^8 t + 3 \sin 10^4 t)$. what form of angle modulation is this? Calculate the carrier and modulating frequencies, the modulation index and deviation and power dissipated in a 100-ohm resistor.   [8+8]

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7. Derive an expression for SNR and figure of merit coherent receptin of SSB modu-
   lated wave. [16]

8. (a) Distinguish between negative peak clipping and diagonal peak clipping in an
       envelope detector. The output of a diode envelope detector is fed through a
       DC blocking capacitor to an amplifying stage, which has an input resistance
       of 10 kilo-ohms. If the diode load resister is 5k-ohm, determine the maximum
       depth of sinusoidal modulation the detector can handle with out negative peak
       clipping.

   (b) Consider a composite wave obtained by adding a non coherent carrier $A_c \cos (2\pi f_c t + \phi)$
       to DSB-SC wave $X(t) \cos (2\pi f_c t)$ where $X(t)$ is the message waveform. This
       composite waveform is applied to ideal envelope detector. Find the resulting
       detector out put. Evaluate this for .

       i. $\phi = 0 \; and$
       ii. $\phi \neq 0 \; and \; |X(t)| << A_c$ [8+8]

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Code No: **NR220404**　　　　　**NR**　　　　　**Set No. 4**

II B.Tech II Semester Examinations,December 2010
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. (a) Draw the complete block diagram of the Armstrong frequency modulation system and explain the function of the mixer and multipliers. In what circumstances can we dispense with the mixer?

   (b) The equation of an angle-modulated voltage $v(t) = 10 \sin(10^8 t + 3 \sin 10^4 t)$. what form of angle modulation is this? Calculate the carrier and modulating frequencies, the modulation index and deviation and power dissipated in a 100-ohm resistor. [8+8]

2. (a) Distinguish between negative peak clipping and diagonal peak clipping in an envelope detector. The output of a diode envelope detector is fed through a DC blocking capacitor to an amplifying stage, which has an input resistance of 10 kilo-ohms. If the diode load resister is 5k-ohm, determine the maximum depth of sinusoidal modulation the detector can handle with out negative peak clipping.

   (b) Consider a composite wave obtained by adding a non coherent carrier $A_c \cos(2\pi f_c t + \phi)$ to DSB-SC wave $X(t) \cos(2\pi f_c t)$ where $X(t)$ is the message waveform. This composite waveform is applied to ideal envelope detector. Find the resulting detector out put. Evaluate this for .

   i. $\phi = 0$ and

   ii. $\phi \neq 0$ and $|X(t)| << A_c$ [8+8]

3. What is meant by fading? Explain with suitable figures and example. Explain the principle of frequency and space diversity techniques employed to reduce the effect of fading. [16]

4. Derive an expression for SNR and figure of merit coherent receptin of SSB modulated wave. [16]

5. (a) Explain the operation of ISB transmitter with block diagram. Where it is used?

   (b) What is the function of crystal filters in SSB transmitter?

   (c) State and explain with respect to 'Q', various types of filters used to separate side bands? [8+4+4]

6. (a) Explain with the help of sketches and mathematical expressions how VSB modulation can be obtained and mention its applications.

(b) An AM broadcast station has a modulation index, which is 0.75 on the average. What would be the average power saving if it could go over to SSB-SC transmission, while having to maintain the same signal strength in the reception area? [16]

7. (a) What signalling facilities are to be provided by subscriber's instrument in an automatic telephone exchange? Show how this is achieved by a schematic diagram.

(b) What is a transmission bridge? What are its functions? Describe the working of one important type of transmission bridge. [8+8]

8. (a) Distinguish between simple AGC and delayed AGC.

(b) Draw a block diagram of a superheterodyne receiver and explain the function of each stage.

(c) What is meant by the term "tracking error"? Explain. [4+8+4]

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NR

Set No. 1

II B.Tech II Semester Examinations,December 2010
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. What is meant by fading? Explain with suitable figures and example. Explain the principle of frequency and space diversity techniques employed to reduce the effect of fading. [16]

2. (a) What signalling facilities are to be provided by subscriber's instrument in an automatic telephone exchange? Show how this is achieved by a schematic diagram.

    (b) What is a transmission bridge? What are its functions? Describe the working of one important type of transmission bridge. [8+8]

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5. (a) Distinguish between negative peak clipping and diagonal peak clipping in an envelope detector. The output of a diode envelope detector is fed through a DC blocking capacitor to an amplifying stage, which has an input resistance of 10 kilo-ohms. If the diode load resister is 5k-ohm, determine the maximum depth of sinusoidal modulation the detector can handle with out negative peak clipping.

    (b) Consider a composite wave obtained by adding a non coherent carrier $A_c \cos(2\pi f_c t + \phi)$ to DSB-SC wave $X(t) \cos(2\pi f_c t)$ where $X(t)$ is the message waveform. This composite waveform is applied to ideal envelope detector. Find the resulting detector out put. Evaluate this for .

    i. $\phi = 0 \ and$
    ii. $\phi \neq 0 \ and \ |X(t)| << A_c$ [8+8]

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   (b) The equation of an angle-modulated voltage $v(t) = 10\sin(10^8 t + 3\sin 10^4 t)$. what form of angle modulation is this? Calculate the carrier and modulating frequencies, the modulation index and deviation and power dissipated in a 100-ohm resistor. [8+8]

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Code No: **NR220404** $\boxed{\textbf{NR}}$ $\boxed{\textbf{Set No. 3}}$

II B.Tech II Semester Examinations,December 2010
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) Distinguish between negative peak clipping and diagonal peak clipping in an envelope detector. The output of a diode envelope detector is fed through a DC blocking capacitor to an amplifying stage, which has an input resistance of 10 kilo-ohms. If the diode load resister is 5k-ohm, determine the maximum depth of sinusoidal modulation the detector can handle with out negative peak clipping.

   (b) Consider a composite wave obtained by adding a non coherent carrier $A_c \cos(2\pi f_c t + \phi)$ to DSB-SC wave $X(t) \cos(2\pi f_c t)$ where $X(t)$ is the message waveform. This composite waveform is applied to ideal envelope detector. Find the resulting detector out put. Evaluate this for .

      i. $\phi = 0$ and
      ii. $\phi \neq 0$ and $|X(t)| << A_c$ [8+8]

2. What is meant by fading? Explain with suitable figures and example. Explain the principle of frequency and space diversity techniques employed to reduce the effect of fading.   [16]

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   (b) The equation of an angle-modulated voltage $v(t) = 10\sin(10^8 t + 3\sin 10^4 t)$. what form of angle modulation is this? Calculate the carrier and modulating frequencies, the modulation index and deviation and power dissipated in a 100-ohm resistor.   [8+8]

6. (a) Explain the operation of ISB transmitter with block diagram. Where it is used?

   (b) What is the function of crystal filters in SSB transmitter?

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(c) State and explain with respect to 'Q', various types of filters used to separate side bands? [8+4+4]

7. (a) What signalling facilities are to be provided by subscriber's instrument in an automatic telephone exchange? Show how this is achieved by a schematic diagram.

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