Code No: R05410409 **R05** **Set No. 2**

IV B.Tech I Semester Examinations,November 2010
SATELLITE 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. Explain to why it is necessary to have frequency coordination among earth stations themselves and earth station-terrestrial microwave link? Discuss the techniques to achieve them? [16]

2. (a) What is meant by EIRP for a transmitter and G/T for a receiver?
   (b) In a satellite uplink, the transmitter system has a loss of 1 dB while the transmitter antenna has a gain of 55 dB.There is an atmospheric loss of 2 dB, a free space loss of 200 dB.The receiving antenna has a gain of 20 dB. The receiving system has a bandwidth of 36 MHz and noise temperature of 1000K. If the desired SNR is 35 dB. Compute:
      i. The required transmitter power
      ii. The receiver noise power.

   If the flux density of the satellite should not exceed -75 dB W/m^2, obtain the trade off possible between the receiver antenna gain and transmitter power. Assume Boltzman constant = -228.6dBW/Hz/K. [8+8]

3. (a) Explain the following in GPS C\A code accuracy:
      i. HDOP
      ii. VDOP
      iii. GDOP.
   (b) Explain how the accuracy in GPS measurement is increased? [8+8]

4. What is Van Allen Belt? Mention its relation with Satellite Communication. [16]

5. (a) Mention the factors on which the selection of an antenna depends. Which antenna is suitable for a satellite.
   (b) What do you mean by Relaibility, Mean time before failure, Effective failure rate as applied to a satellite subsystem and components. Explain the significance of the bath-tub curve. [8+8]

6. (a) Derive expressions for umbra and penumbra angles and show that the optimum eclipse duration is about 1 hour and 10 minutes.
   (b) Show that the period of revolution of a geostationary satellite is approximately 24 hours. [12+4]

7. Explain the coverage of an equatorial and Inclined orbit of LEO. [16]

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8. (a) Define Multiple access techniques and explain briefly?
   (b) Differentiate the multiplexing and multiple access techniques? [10+6]

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Code No: R05410409 **R05** **Set No. 4**

IV B.Tech I Semester Examinations,November 2010
SATELLITE 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. Explain the coverage of an equatorial and Inclined orbit of LEO. [16]
2. What is Van Allen Belt? Mention its relation with Satellite Communication. [16]
3. (a) Mention the factors on which the selection of an antenna depends. Which antenna is suitable for a satellite.
   (b) What do you mean by Relaibility, Mean time before failure, Effective failure rate as applied to a satellite subsystem and components. Explain the significance of the bath-tub curve. [8+8]
4. Explain to why it is necessary to have frequency coordination among earth stations themselves and earth station-terrestrial microwave link? Discuss the techniques to achieve them? [16]
5. (a) Derive expressions for umbra and penumbra angles and show that the optimum eclipse duration is about 1 hour and 10 minutes.
   (b) Show that the period of revolution of a geostationary satellite is approximately 24 hours. [12+4]
6. (a) Explain the following in GPS C\A code accuracy:
      i. HDOP
      ii. VDOP
      iii. GDOP.
   (b) Explain how the accuracy in GPS measurement is increased? [8+8]
7. (a) Define Multiple access techniques and explain briefly?
   (b) Differentiate the multiplexing and multiple access techniques? [10+6]
8. (a) What is meant by EIRP for a transmitter and G/T for a receiver?
   (b) In a satellite uplink, the transmitter system has a loss of 1 dB while the transmitter antenna has a gain of 55 dB.There is an atmospheric loss of 2 dB, a free space loss of 200 dB.The receiving antenna has a gain of 20 dB. The receiving system has a bandwidth of 36 MHz and noise temperature of 1000K. If the desired SNR is 35 dB. Compute:
      i. The required transmitter power
      ii. The receiver noise power.

If the flux density of the satellite should not exceed -75 dB W/m^2, obtain the trade off possible between the receiver antenna gain and transmitter power. Assume Boltzman constant = -228.6dBW/Hz/K. [8+8]

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Code No: R05410409 **R05** **Set No. 1**

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SATELLITE 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) Derive expressions for umbra and penumbra angles and show that the optimum eclipse duration is about 1 hour and 10 minutes.
   (b) Show that the period of revolution of a geostationary satellite is approximately 24 hours. [12+4]
2. (a) Define Multiple access techniques and explain briefly?
   (b) Differentiate the multiplexing and multiple access techniques? [10+6]
3. (a) Mention the factors on which the selection of an antenna depends. Which antenna is suitable for a satellite.
   (b) What do you mean by Relaibility, Mean time before failure, Effective failure rate as applied to a satellite subsystem and components. Explain the significance of the bath-tub curve. [8+8]
4. (a) What is meant by EIRP for a transmitter and G/T for a receiver?
   (b) In a satellite uplink, the transmitter system has a loss of 1 dB while the transmitter antenna has a gain of 55 dB.There is an atmospheric loss of 2 dB, a free space loss of 200 dB.The receiving antenna has a gain of 20 dB. The receiving system has a bandwidth of 36 MHz and noise temperature of 1000K. If the desired SNR is 35 dB. Compute:
      i. The required transmitter power
      ii. The receiver noise power.

      If the flux density of the satellite should not exceed -75 dB W/m^2, obtain the trade off possible between the receiver antenna gain and transmitter power. Assume Boltzman constant = -228.6dBW/Hz/K. [8+8]
5. (a) Explain the following in GPS C\A code accuracy:
      i. HDOP
      ii. VDOP
      iii. GDOP.
   (b) Explain how the accuracy in GPS measurement is increased? [8+8]
6. Explain the coverage of an equatorial and Inclined orbit of LEO. [16]

7. Explain to why it is necessary to have frequency coordination among earth stations themselves and earth station-terrestrial microwave link? Discuss the techniques to achieve them? [16]

8. What is Van Allen Belt? Mention its relation with Satellite Communication. [16]

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Code No: R05410409 **R05** **Set No. 3**

IV B.Tech I Semester Examinations,November 2010
SATELLITE 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 Van Allen Belt? Mention its relation with Satellite Communication. [16]
2. (a) Define Multiple access techniques and explain briefly?
   (b) Differentiate the multiplexing and multiple access techniques? [10+6]
3. (a) Mention the factors on which the selection of an antenna depends. Which antenna is suitable for a satellite.
   (b) What do you mean by Relaibility, Mean time before failure, Effective failure rate as applied to a satellite subsystem and components. Explain the significance of the bath-tub curve. [8+8]
4. (a) Derive expressions for umbra and penumbra angles and show that the optimum eclipse duration is about 1 hour and 10 minutes.
   (b) Show that the period of revolution of a geostationary satellite is approximately 24 hours. [12+4]
5. Explain the coverage of an equatorial and Inclined orbit of LEO. [16]
6. Explain to why it is necessary to have frequency coordination among earth stations themselves and earth station-terrestrial microwave link? Discuss the techniques to achieve them? [16]
7. (a) What is meant by EIRP for a transmitter and G/T for a receiver?
   (b) In a satellite uplink, the transmitter system has a loss of 1 dB while the transmitter antenna has a gain of 55 dB.There is an atmospheric loss of 2 dB, a free space loss of 200 dB.The receiving antenna has a gain of 20 dB. The receiving system has a bandwidth of 36 MHz and noise temperature of 1000K. If the desired SNR is 35 dB. Compute:
      i. The required transmitter power
      ii. The receiver noise power.

   If the flux density of the satellite should not exceed -75 dB W/m^2, obtain the trade off possible between the receiver antenna gain and transmitter power. Assume Boltzman constant = -228.6dBW/Hz/K. [8+8]
8. (a) Explain the following in GPS C\A code accuracy:
      i. HDOP

ii. VDOP
iii. GDOP.

(b) Explain how the accuracy in GPS measurement is increased? [8+8]

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