PRESIDENCY UNIVERSITY, BENGALURU

SCHOOL OF ENGINEERING

Weightage: 40 %   Max Marks: 40   Max Time: 2 hrs.   11 May 2018, Friday

ENDTERM FINAL EXAMINATION MAY 2018

Even Semester 2017-18   Course: **ECE 305 Satellite Communication**   VI Sem. ECE

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Instructions:

(i)   Read the question properly and answer accordingly.
(ii)   Question paper consists of 3 parts.
(iii)   Scientific and Non-programmable calculators are permitted.

Part A

(2 Q x 4 M = 08 Marks)

1. Explain what is meant by Single Access in relation to the communication network. Give an Example.
2. Explain what is the abbreviation SCPC stands for? Explain in detail the operation of a preassigned SCPC network.

Part B

(2 Q x 6 M = 12 Marks)

3. What is the significance of Spread Spectrum? How it can be done with proper diagram & explain the process.
4. Write the services provided by the Satellite Mobile: Iridium & Ellipso.

Part C

(2 Q x 10 M = 20 Marks)

5. A system is given as follows: The system is consisting of right shift register and an X-OR Gate. The sequence will start with 110. With Bipolar NRZ representation:
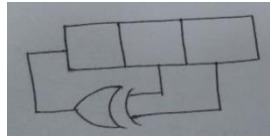
   i)   Create the Carrier Sequence.
   ii)   Assume the message signal will start with {-1, 1}, then generate DSSS Code.
   iii)   Write the values of output for 8 Clock Pulses.
   iv)   Demodulate the same message signal at the output of the receiver.
6. Write a Short notes on GPS with necessary diagrams. How it is different from GLONASS.

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Weightage: 20%   Max Marks: 20   Max Time: 1 hr.   28 March Wednesday 2018

TEST – 2   SET A

Even Semester 2017-18   Course: ECE 305   **Satellite Communication**   VI Sem. ECE

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Instruction:
  (i)   *Read the question properly and answer accordingly.*
  (ii) *Question paper consists of 3 parts.*
  (iii) Scientific and Non-programmable calculators are permitted

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Part A

(2 Q x 3 M = 06 Marks)

1. Define the terms: i) Payload ii) Bus iii) Transponder

2. Explain what is meant by Thermal Control & how it can be done?

Part B

(2 Q x 4 M = 08 Marks)

3. Describe the East-West and North-South station keeping maneuvers required in satellite station keeping. What are the angular tolerances in station keeping that must be achieved?

4. Draw to scale the uplink & downlink channeling schemes for a 500-MHz bandwidth C-Band satellite, accommodating the full complement of 36 MHz-bandwidth transponders. Assume the use of 4-MHz guard band.

Part C

(1 Q x 6 M = 06 Marks)

5. Calculate the Attenuation due to Rain in PRESIDENCY UNIVERSITY, Bengaluru (13.17N, 77.53E) taking it as an Earth Station & GEO Satellite position is located at 93E. Rain fall Rate ($R_{0.01}$) will be obtained from ITU-R as 33.9 mm/hr. Height above mean sea level is 900 m. Assume Vertical Polarization & Frequency is 20 GHz. Given K= 0.0691 & α= 1.065

ID NO:

PRESIDENCY UNIVERSITY, BENGALURU

SCHOOL OF ENGINEERING

Weightage: 20 %   Max Marks: 40   Max Time: 1 hr.   20 Feb Tuesday 2018

TEST – 1

Even Semester 2017-18 Course: ECE 305 **Satellite Communication**   VI Sem. ECE

Instruction:
  (i)   *Read the question properly and answer accordingly.*
  (ii) *Question paper consists of 3 parts.*
  (iii) Scientific and Non-programmable calculators are permitted

Part A

(4 Q x 4 M = 16 Marks)

1. Why Uplink frequency is higher than downlink frequency? Give proper reasons.

2. Compare different types of orbits in satellite communication?

3. Define the terms: i) Line of apisides ii) Prograde Orbit iii) Eccentricity iv) Inclination.

4. Mention some of the advantages of Satellite Communication.

Part B

(2 Q x 8 M = 16 Marks)

5.

   i)   State & Explain Keplar's three laws of planetary motion.

   ii) An amplifier has a quoted noise figure of 3 dB. What is its equivalent noise temperature?

6. Describe the basic link analysis of whole Satellite Communication.

Part C

(1Q x 8 M = 8 Marks)

7. A Ka-Band earth station has an antenna with a transmit gain of 37 dB. The transmitter output power is set to 1000 W at a frequency of 14 GHz. The signal is received by a satellite at a distance of 42,500 KM by an antenna with a gain of 26 dB. The signal is then routed to a transponder with a noise temp. of 600 K, a bandwidth of 36MHz & a gain of 120 dB. Calculate the following parameters:

   i)   Path loss at 14 GHz.

   ii) Power at the output port.

   iii) Noise power at the transponder input with a BW of 36MHz.

   iv) CNR in ratios & in dB in the transponder.