

International Islamic University Chittagong (IIUC)

Dept. of Electronic and Telecommunications Engineering

Final Examination

Program: B.Sc. (Engg.)

Course Code: ETE 4705

Full Marks: 50

Semester: Spring, 2018

Course Title: Satellite Communications

Time: 2.5 Hours

[Part- A]

[Answer any two of the following questions]

1. (a) What is interleaving? Why is it used? Describe the interleaving process in detail. 05
- (b) What is depolarization? Explain how depolarization is caused by rain. 05
2. (a) Describe the noise power spectral density from following figure: 05

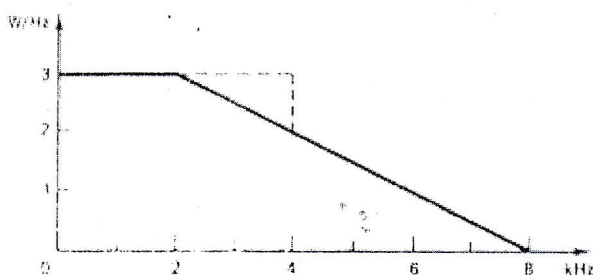


Fig.1

- (b) A satellite TV signal occupies the full transponder bandwidth of 36 MHz, and it must provide a C/N ratio at the destination earth station of 22 dB. Given that the total transmission losses are 200 dB and the destination earth station G/T ratio is 31 dB/K, calculate the satellite EIRP required. 05
3. (a) Drive the free space loss equation for both the uplink and downlink satellite circuit. A satellite at a distance of 40000km from a point on Earth surface radiates power of 10W into antenna gain of 17dB. Find the flux density on the Earth surface and the power received using antenna with effective aperture of 10 square meters. 03+04
- (b) The satellite in Q3(a) operates at a frequency of 11GHz (Ku band). The gain of the receiving antenna is 52.3dB. Find the received power. 03

[Part- B]

[Answer any three of the following questions]

4. (a) What is DAMA? Describe Spade systems with suitable diagram. 02+04
- (b) Describe the general operating principles of a TDMA network. 04
5. (a) Describe the GPS Receiver Operation with suitable figures. 06
- (b) Why does GPS sometimes show wrong position? 04
6. (a) What is GPS? What are the types of GPS Codes and why they are necessary? 02+03
- (b) Describe the GPS position location principles with suitable block diagram. 05
7. a) Describe the multiple access schemes for different VSAT network configurations. 05
- b) What is VSAT? Draw the simplified block diagram of VSAT Earth Station Transmitter and Receiver and explain its operation. 05