|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  |  |  |  |

**Reg. No. :**

**Question Paper Code: 49042A**

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2017

Elective

Electronics and Communication Engineering

14UEC917 - SATELLITE COMMUNICATION PRINCIPLES AND APPLICATIONS

(Regulation 2014)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. The equatorial plane is tilted at angle of \_\_\_\_\_\_\_\_to the elliptical plane.

(a )18° (b) 23.4° (c) 24.3° (d) 25.3°

2. The carrier to noise ratio for a satellite depends upon

(a) Effective Isotropic Radiated power (b) Bandwidth (c) Free space path losses (d) All the above

3. Define Universal time day

(a) UT day =1/24(hours+minutes/60+seconds/3600) (b) UT day =1/24(hours+minutes+seconds/3600) (c) UT day =1/24(hours+minutes/6+seconds/360) (d) None of these

4. Noise figure can be expressed as,

(a) 10 log F (b) F/ 10 log 10 (c) 20 log F (d) 20 log F / 10

5. A satellite downlink at 12GHZ operates with a transmit power of 6w & an antenna gain of 48.2db. Calculate the EIRP in dBw.

(a) 56dBw (b) 16dBw (c) 56dB (d) None of these

6. ISI stands for

(a) Ionosphere satellite interference (b) Inter modulation symbol interference (c) Inter symbol interference (d) Inter satellite interference

7. The frequencies for direct broadcast satellites vary from region to region throughout the world, although these are generally in the

(a) Ku band (b) Ka band (c) C-band (d) None of these

8. The alphabets used in colour TV signals are

(a) Y,T and V (b) Y,I and Q (c) Y,A and M (d) Y,C and R

9. The CATV system employs a single\_\_\_\_\_\_\_\_\_, with separate feeds available for each sense of polarization.

(a) Outdoor unit (b) Indoor unit (c) TV unit (d) None of these

10. The following parameter is considered for evaluating performance of internet system

(a)Users (b) Bit Error Rate (c) Security (d) Mobility

PART - B (5 x 2 = 10 Marks)

11. What is meant by line of nodes for earth orbiting satellites?

12. Why do we need thermal control satellites?

13. What are the several factors dominate the design of any system using Geostationary satellites?

14. Define Gain of an antenna.

15. Give the types of satellite services.

PART - C (5 x 16 = 80 Marks)

16. (a) (i) What are the effects of a non spherical earth on the orbital mechanics of a

Satellite. (8)

(ii) Discuss the orbital effects in communications system performance. (8)

Or

(b) Explain in detail the geocentric equatorial coordinate system which is based on the earth’s equatorial plane. (16)

17. (a) Describe briefly the most common type of high power amplifying device (TWTA) used aboard a communication satellite. (16)

Or

(b) (i) Derive the expression for amplifier noise temperature with suitable diagram. (8)

|  |
| --- |
| (ii) What is meant by pass band interference? Explain briefly (8) |

18. (a) Draw a block diagram for digital transmission system and explain each blocks. (16)

Or

(b) (i) Draw the block diagram and explain the system noise temperature. (8)

(ii) Explain the EIRP and transmission losses. (8)

19. (a) Give a brief account of satellite TV network distribution and direct broadcasting.

(16)

Or

(b) Describe the general operating principles of a TDMA network. Show how the transmission bit rate is related to the input bit rate. (16)

20. (a) Explain in detail satellite navigational system. (16)

Or

(b) Describe in detail about the concept of Global Positioning Satellite (GPS).

(16)