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APR-MAY

B. E. (Eighth Semester) Examination, 2020

(New Scheme)

(Et & T Engg. Branch)

ADVANCED COMMUNICATION SYSTEMS

Time Allowed : Three hours

Maximum Marks : 80

Minimum Pass Marks : 28

Note : *Part (a) of each question is compulsory. Attempt any* ***two*** *parts from (b), (c) and (d)*

Unit-I

1. (a) What is Satellite Stabilization? 2

(b) A geo-synchronous satellite moving in a equatorial circular orbit at the hight 35786 k.m. from the earth

surface. If the earth radius is taken as 6378 km. Determine the coverage angle and slant range (elevation angle = 0°). 7

(c) What are the elements of satellite communication system? Explain each with suitable block diagram. 7

(d) Explain the basic differences between an active satellite systems. Discuss their merit and demerits. 7

Unit-II

2. (a) Define Noise figure and Noise temperature. 2

(b) Why satellite link design is done? Derive the general link design equation for communication satellite. 7

(c) Explain in detail interference effects on complete link design. 7

(d) In the link budget of a satellite, the free space loss at 12 GHz is 210 db, the antenna pointing loss is 2 db and atmospheric absorption is 2 db. If the receiver C/T ratio is 19 db/K, receiver feeder losses are 1 db 8 the E&RP is 50 dbW. Calculate the carrier to noise spectral density ratio. 7

Unit-III

3. (a) What is difference between multipliexing and multiple access technique? 2

(b) What is Burst? Explain the difference between the burst and traffic burst. Explain their structure too. 7

(c) What is CDMA? Explain in detail. In what way it is superior to TDMA. 7

(d) Explain the operation of typical satellite switched TDMA (SSTDMA) system. 7

Unit-IV

4. (a) Define skey rays. 2

(b) A multinode step index fiber has a numerical aperture of 0·3 and core refractive index of 1·45. The material dispersion parameter for the fibre is 250 PS nm^{-1} km^{-1} which makes material dispersion the totally dominating intrumodal dispersion mechanism. Estimate :

(i) Total rms pulse broadening per km when the fiber is used with an LED source of rms spectral width 50 nm.

(ii) Corresponding bandwidth length product for the fiber. 7

(c) Explain different types of attenuations used in optical fiber communication. 7

(d) Explain with the aid or diagram :

(i) The multimode step index fiber

(ii) The single mode step index fiber.

Compare the advantages and disadvantages of these two types of fiber for use as an optical channel. 7

Unit-V

5. (a) Define homojunction and hetrojunction LED. 2

(b) Compare the LED of LASER on the following points :

(i) Spectral width

(ii) Coupling efficiency

(iii) Modulation B.W.

(iv) Lifetime

(v) Cost

(vi) Temp. senstivity

(vii) Compatible fiber 7

(c) Compare SONET & SDH optical network. 7

(d) Write short note on any **two** : 7

(i) Semiconductor photodiode

(ii) PIN photodiode

(iii) Avalance photodiode