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6E6058

B.Tech. VI Semester (Main/Back) Examination, April/May - 2017

Electronics & Communication Engg.

6EC6.3A OPtical Fiber Communcation

Time : 3 Hours **Maximum Marks : 80**

Min. Passing Marks : 26

Instructions to Candidates:

*Attempt any **five questions**, selecting **one question** from **each unit**. All questions carry **equal** marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitable by assumed and stated clearly). Units of quantities used/calculated must be stated clearly.*

Unit - I

1. a) What is dispersion? Explain dispersion shifted & dispersion flattened optical fiber cables? **(8)**

   b) Discuss Absorption Losses in optical fiber, comparing and contrasting the intrinsic & extrinsic Absorption mechanisms. **(4)**

   c) A 15 km optical fiber Link uses fiber with a loss of 1.5 dB/km. The fiber is jointed every kilometer with connectors, which give an attenuation of 0.8 dB each. Determine the minimum mean optical power, that must be Launched into the fiber in order to maintain a mean power Level of 0.3μw at the detector. **(4)**

OR

1. a) Define the Relative Refractive Index difference for an optical fiber & show how it may be related to the Numerical Aperture? **(8)**

   b) Explain the fabrication of optical fiber by vapour phase method. **(8)**

Unit - II

2. a) Describe the following characteristics of LASER **(8)**

   i) Threshold current temperature dependence.

   ii) Reliability

   iii) Noise

   iv) Frequency chirp

   b) Describe the optical characteristics of LED with neat sketch? **(8)**

OR

2. a) Write short notes on Q-switching? **(8)**

   b) A Laser Contains a crystal Length 4cm with a Refractive Index of 1.78. The peak emission wavelength from the device is 0.55 μm. Determine the number of longitudinal modes & their frequency separation? **(8)**

Unit - III

3. a) Explain the structure features & working principle of PIN photodiode. What is the functional significance of intrinsic Layer inserted in between the P&N Layer? **(4+4=8)**

   b) What is difference between connector and splices? Explain different types of splices with neat diagram? **(8)**

OR

3. a) Explain the structure & the working of APD with the help of suitable diagram. Write advantages & disadvantages of APD over PIN diode? **(8)**

   b) Ga As has a band gap energy of 1.43 eV at a 300k. Determine the wavelength above which an intrinsic photo detector fabricated from this material will cease to operate. **(8)**

Unit - IV

4. a) Explain Laser based system for measurement of distance with neat diagram. **(8)**

   b) Write a short notes on Holography? **(8)**

OR

4. a) What is the working principle of OTDR? Explain the process of fault location Identification through OTDR infield? **(8)**

   b) Explain the time domain technique for measurement of dispersion with neat diagram? **(8)**

Unit - V

5. a) Write down the applications of optical fiber instrumentation in daily life? Also gives its advantages & draw backs with clarifications? **(8)**

   b) Explain WDM & DWDM in optical fiber. **(8)**

OR

5. a) What is the need of optical Amplifier? Explain Fiber Raman Amplifier (FRA) with neat diagram? **(8)**

   b) Write a short note on Active and Passive components used in optical fiber system? **(8)**

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