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Reg. No. : .....

Name : .....

Seventh Semester B.Tech. Degree Examination, October 2014
(2008 Scheme)
08.702 : OPTICAL COMMUNICATION (T)

Time : 3 Hours Max. Marks : 100

PART – A

Answer **all** questions. **Each** carries **4** marks.

1. Differentiate between material and modal dispersion.
2. List the merits of soliton communication systems.
3. What is meant by Relative Intensity Noise (RIN) ?
4. What are the challenges in DWDM ?
5. What are the different types of Optical Amplifiers ?
6. Compare coherent and IMDD systems.
7. What is numerical aperture of a fiber ? What is its relationship with V-parameter ?
8. Briefly explain polarization mode dispersion.
9. What are the different optical windows ?
10. The quantum efficiency of a particular Silicon RAPD is 80% for the detection of radiation at a wavelength of 0.9 μm when the incident optical power is 0.5 μw , the output current from the device is 11 μA . Determine the responsivity and multiplication factor of the photodiode under these conditions.

P.T.O.

PART – B

Answer **any two** questions from **each** Module. **All** questions carry **equal** marks.

Module – I

11. Explain the vapour phase oxidation process of fiber fabrication with suitable figures.

12. Explain the structure and working APD, and compare its performance with PIN photodiode.

13. a) A 6 km optical link consists of multimode step index fiber with a core refractive index of 1.5 and relative refractive index difference of 1%. Estimate
    a) the delay difference between the slowest and fastest modes at the fiber output.
    b) the rms pulse broadening due to intermodal dispersion on the link.

    b) Write notes on bending loss and scattering loss in optical fibers.

Module – II

14. Explain the working of PSK heterodyne detection systems and derive an expression for bit error rate.

15. Explain the working principle of EDFA and what are the noises present in EDFA and how they are minimised.

16. a) An analog optical fiber system operating at a wavelength of 1 μm has a post detection bandwidth of 5 MHz. Assuming an ideal detector and considering only quantum noise on the signal. Calculate the incident optical power necessary to achieve an SNR of 50 dB at the receiver.

    b) What are the different types of pre-amplifiers in optical receivers ?

Module – III

17. Explain the architecture of WDM system with block diagram and also explain the add/drop procedure in WDM system.

18. Explain briefly :
    a) GH effect
    b) Light wave networks.

19. Draw the structure of soliton link and derive an expn. for bit error rate.