Roll No. | | | | | | | | | | | | | Total No. of Pages : 02

Total No. of Questions : 18

B.Tech. (ECE) (2012 to 2017) (Sem.–7)

OPTICAL COMMUNICATION

Subject Code : BTEC-702

M.Code : 71911

Time : 3 Hrs. Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.**
3. **SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.**

SECTION-A

Write briefly :

1. What is the concept of pulse broadening?
2. Explain briefly fiber coupling losses.
3. How BER helps to determine receiver performance?
4. Discuss the concept of negative resistance in APD photo-detector.
5. Using Ray theory describes the mechanism for the propagation of light in an optical fiber.
6. "*Nonlinearities are related with intensity*", Justify the statement.
7. A graded index fiber has a parabolic refractive index profile with 45 μm diameter. The numerical aperture is 0.25. Find out the number of guided modes propagating when it is operating at 1.5 μm wavelength.
8. Give details of optical cable construction.
9. Draw diagram and explain briefly distributed feedback laser.
10. How frequency chirping effects the bandwidth?

SECTION-B

11. A glass clad fiber is made with core glass of refractive index 1.5 and cladding is doped to give a fractional index difference 0.0005. Calculate the cladding index and critical internal reflection angle.

12. What do you understand by FWHM? How does it apply to LED's characteristics?

13. Differentiate the optical TDM system and code division multiplexing system.

14. A multimode step index fiber has a relative refractive index difference of 1 % and a core refractive index of 1.5. The number of modes propagating at a wavelength of 1.3 μm is 1100. Estimate the diameter of the fiber.

15. Discuss with the aid of a block diagram, the function of an optical fiber receiver in communication with its components.

SECTION-C

16. Fiber to fiber coupling losses is affected by intrinsic and extrinsic coupling losses. Can intrinsic coupling losses be limited by limiting fiber mismatches?

17. Outline structure of tunable semiconductor lasers for optical fiber communications discussing their relative merits and drawbacks.

18. Explain the following mechanism associated within optical fiber communication :

    a) Quantum shot noise

    b) Avalanche excess noise

    c) Fiber mode partition noise

    d) Thermal noise

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.