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Total No. of Questions : 18

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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 μ m diameter. The numerical aperture is 0.25. Find out the number of guided modes propagating when it is operating at 1.5 μ m wavelength.
- 8. Give details of optical cable construction.
- 9. Draw diagram and explain briefly distributed feedback laser.
- 10. How frequency chirping effects the bandwidth?

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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?
- Outline structure of tunable semiconductor lasers for optical fiber communications 17. discussing their relative merits and drawbacks.
- 18. Explain the following mechanism associated within optical fiber communication : .v.
 - 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.

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