

## SARDAR PATEL UNIVERSITY

T.Y. B.Sc. (Electronics &amp; Communication) (Sem. - VI) Examination

Monday, 2<sup>nd</sup> April, 2018

Time: 10:00 a.m. to 1:00 p.m.

Subject Code: US06CELC04, Subject: Optical fiber communication

## Instructions:

(a) Figure to the right indicates full marks.

(b) All questions are compulsory.

Total Marks: 70

Q-1

Choose the correct answer.

(10)

1. What is the formula for Snell's law?  
(a)  $n_1 \sin \theta_1 = n_2 \sin \theta_2$   
(b)  $n_1 \sin \theta_1 > n_2 \sin \theta_2$   
(c)  $n_1 \sin \theta_1 < n_2 \sin \theta_2$   
(d) None
2. Refractive index of cladding is always \_\_\_\_\_ core.  
(a) Greater than the  
(b) Less than the  
(c) Same as  
(d) None
3. Which fiber typically has the largest core?  
(a) Plastic fiber  
(b) Single mode fiber  
(c) Glass fiber  
(d) Multimode fiber
4. A permanent joint formed between two different optical fibers in the field is known as \_\_\_\_\_.  
(a) Fiber connector  
(b) Fiber attenuator  
(c) Fiber splicing  
(d) Fiber dispersion
5. Single mode fiber has \_\_\_\_\_ light carrying core than multimode fiber.  
(a) Larger  
(b) Same  
(c) Smaller  
(d) None
6. Colour of the LED depends upon the \_\_\_\_\_.  
(a) Forward bias  
(b) Reverse bias  
(c) Zero bias  
(d) Semiconductor material
7. Which among the following is not supported in the soot formation process?  
(a) OVPO  
(b) MCVD  
(c) PCVD  
(d) All
8. The largest contributor to fiber attenuation is \_\_\_\_\_.  
(a) Absorption  
(b) Micro bends  
(c) Bending losses  
(d) Scattering
9. \_\_\_\_\_ is a device used to reduce power level of an optical signal.  
(a) LED  
(b) Optical attenuator  
(c) Laser  
(d) None
10. Which types of dispersion affects single mode fiber as well as multimode fiber?  
(a) Intra model  
(b) Intermodal  
(c) Chromatic  
(d) Polarization mode

(P.T.O)

- Q-2** Answer the following questions. (Any Ten) (20)
1. Explain total internal reflection.
  2. What is meant by reflection and refraction in optical fiber?
  3. Explain Snell's law.
  4. Mention the advantages of plastic fiber over glass fiber.
  5. Explain intermodal and intra model dispersion in optical fiber.
  6. Give an account of fiber material.
  7. Define Micro bending.
  8. Explain the term signal attenuation and signal distortion.
  9. What are the advantages of LED?
  10. Mention the different types of losses occur in optical fiber.
  11. What do you mean by population inversion?
  12. Compare LED and LASER.
- Q-3** A Define Numerical Aperture .Obtain an expression for numerical aperture of an optical fiber. (10)
- OR**
- B Draw the block diagram of basic element of Optical fiber communication and explain in detail. (10)
- Q-4** A Discuss in detail different types of Optical fiber with necessary diagram. (07)
- B Explain fusion splicing. (03)
- OR**
- C Explain different splicing technique in detail. (07)
- D Discuss the modes of propagation and index profile. (03)
- Q-5** A Write a short note on absorption loss occurs in optical fiber. (07)
- B Explain scattering loss. (03)
- OR**
- C What do you mean by dispersion? Discuss different types of dispersion. (07)
- D Explain waveguide dispersion. (03)
- Q-6** A Give the structure of LED in detail. (07)
- B Write full form of LASER and discuss its applications. (03)
- OR**
- C Discuss in detail construction and principle of operation of PIN diode. (07)
- D Write a basic principle of Avalanche Photodiode. (03)