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SEAT No. \_\_\_\_\_

No. of Printed Pages : 2

**SARDAR PATEL UNIVERSITY**

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

**Day & Date: Monday; 01/04/2019**

**Time: 10:00 am TO 1:00 pm**

**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. The maximum angle at which light entering the core is transmitted through the fiber and propagated without being refracted is known as \_\_\_\_\_.  
(a) Acceptance angle (b) Critical angle  
(c) Numerical aperture (d) None
2. Refractive index of core is always \_\_\_\_\_ core.  
(a) Less than the (b) Greater than the  
(c) Same as (d) None
3. Intermodal dispersion is nonexistent in \_\_\_\_\_.  
(a) multimode (b) Step-index multimode  
(c) Single mode (d) none
4. How many types of mechanism are present which produce dispersion in optical fiber?  
(a) one (b) two  
(c) three (d) Four
5. Wavelength of multimode fiber is \_\_\_\_\_.  
(a) 850 nm to 1300 nm (b) 550 nm to 850 nm  
(c) 1310 nm to 1550 nm (d) 150 nm to 550 nm
6. Colour of the LED depends upon the \_\_\_\_\_.  
(a) Forward bias (b) Semiconductor material  
(c) Zero bias (d) Reverse bias
7. Which among the following is not supported in the soot formation process?  
(a) OVPO (b) MCVD  
(c) PCVD (d) All
8. The electrodes of Gunn diode are made of \_\_\_\_\_.  
(a) Molybdenum (b) GaAs  
(c) copper (d) Gold
9. \_\_\_\_\_ is a device used to reduce power level of an optical signal.  
(a) Optical attenuator (b) LED  
(c) Laser (d) None
10. A PIN diode consists of \_\_\_\_\_ number of semiconductor layers.  
(a) Four (b) Three  
(c) two (d) One

Q-2 Answer the following questions. (Any Ten) (20)

1. Explain numerical aperture in fiber optics.
2. Explain meridional ray.
3. Explain the principle of optical fiber.
4. Mention different fiber fabrication techniques.
5. Explain skew rays.
6. What are the difference between plastic fiber and glass fiber?
7. Explain signal attenuation in fiber optics.
8. Draw the diagram of graded index fiber.
9. Draw the structure of surface emitting LED.
10. What are the advantages and disadvantages of edge emitting LED?
11. Draw the structure of PIN photo diode.
12. Explain avalanche photo diode.

Q-3 Draw the block diagram of basic element of optical fiber communication and explain in detail. (10)

OR

Define acceptance angle. Obtain an expression for acceptance angle of an optical fiber. (10)

Q-4 A Explain different splicing technique in detail. (05)

B Explain Modified chemical vapor deposition (MCVD) fiber fabrication techniques. (05)

OR

C Discuss in detail different types of optical fiber with necessary diagram. (05)

D Explain Vapor phase axial deposition (VAD) fiber fabrication techniques. (05)

Q-5 A Write a short note on absorption loss occurs in optical fiber. (05)

B Explain material dispersion in optical fiber. (05)

OR

C Write a short note on: Micro bending and Macro bending. (05)

D Write a short note on : Core and Cladding losses in optical fiber. (05)

Q-6 What is light emitting diode? Give the structure of LED in detail. (10)

OR

Discuss in detail construction and principle operation of LASER diode. (10)

\*\*\*\*\*X\*\*\*\*\*

(2)