



**HCO-003-027704**

Seat No. \_\_\_\_\_

**M. Sc. (ECI) (Sem. VII) (CBCS) Examination**

**October – 2017**

**Paper - 28 : Fiber Optics  
(New Syllabus)**

**Faculty Code : 003**

**Subject Code : 027704**

Time :  $2\frac{1}{2}$  Hours]

[Total Marks : 70

- Instructions :**
- (1) All questions carry equal marks.
  - (2) Figures on the right hand side indicate marks.

**1 Answer the following : (Any Seven) 14**

- (1) Draw the block diagram of fundamental communication system.
- (2) Define the optical fiber waveguide.
- (3) What is the step-index and graded-index type optical fiber waveguide ?
- (4) Give the reason for absorption of light in optical fiber.
- (5) What is direct and indirect bandgap in semiconductor material ?
- (6) Define heterojunction in construction of LED for fiber optic communication.
- (7) Define connector and splice in context of fiber to fiber joint.
- (8) What is a function of photodetector in fiber optic communication ?
- (9) Define the responsivity of photodiode.
- (10) What is the function of OTDR device ?

<b>2</b>	Answer the following : (Any <b>Two</b> )	<b>14</b>
	(a) Write a note on advantages of fiber optic communication.	<b>7</b>
	(b) Write a note on attenuation in optical fiber communication.	<b>7</b>
	(c) Explain different types of index profile of fiber optic.	<b>7</b>
<b>3</b>	Answer the following :	<b>14</b>
	(a) Write a note on bending loss.	<b>5</b>
	(b) Explain information capacity determination and group delay in optical waveguide.	<b>5</b>
	(c) With proper diagrams, explain energy bands of P-type and N-type semiconductor material.	<b>4</b>
<b>OR</b>		
<b>3</b>	Answer the following :	<b>14</b>
	(a) Explain the schematic of an edge-emitting double heterojunction LED structure.	<b>7</b>
	(b) Write a note on LASER diode.	<b>7</b>
<b>4</b>	Answer the following :	<b>14</b>
	(a) Explain the types of mechanical misalignments between two joined fibers.	<b>7</b>
	(b) Write a note on fiber end-face preparation.	<b>7</b>
<b>5</b>	Answer the following : (Any <b>Two</b> )	<b>14</b>
	(a) Write a note on PIN photodetector.	<b>7</b>
	(b) Explain response time and avalanche multiplication of photodiode.	<b>7</b>
	(c) Explain cut-back technique and insertion-loss method for optical communication.	<b>7</b>
	(d) Write a note on OTDR.	<b>7</b>