

# C.U.SHAH UNIVERSITY

## Winter Examination-2015

**Subject Name : Optical Communication**

**Subject Code : 4TE05OCM1**

**Branch : B.Tech (EC)**

**Semester : 5      Date :9/12/2015      Time :2:30 To 5:30      Marks : 70**

**Instructions:**

- (1) Use of Programmable calculator & any other electronic instrument is prohibited.
- (2) Instructions written on main answer book are strictly to be obeyed.
- (3) Draw neat diagrams and figures (if necessary) at right places.
- (4) Assume suitable data if needed.

<b>Q-1</b>	<b>Attempt the following short answer type questions:</b>	<b>(14)</b>
	a) Write two characteristics of light-wave communication.	2
	b) Define a fiber.	1
	c) Define 'attenuation'	1
	d) With help of an example compare 'optical dispersion and distortion'.	2
	e) Write full forms of APD and EDFA.	1
	f) Discuss, how does GaAs differ from Si?	2
	g) Write significance of fiber splicing in two sentences.	2
	h) Write the limitations of isolators.	2
	i) Define 'cut off wavelength'.	1

**Attempt any four questions from Q-2 to Q-8**

<b>Q-2</b>	<b>Attempt all questions</b>	<b>(14)</b>
	a. Enlist key elements of optical fiber systems. Throw light on various OFC standards.	3
	b. Define total internal reflection. Discuss its applications and significance with help of necessary formulae and figures.	5
	c. Define and describe: modal delay, and group delay.	6
<b>Q-3</b>	<b>Attempt all questions</b>	<b>(14)</b>
	a. Write short notes on:	6
	i. Numerical aperture	
	ii. Comparison between phase and group velocity	
	b. Describe the scattering, bending, core and cladding losses relating to the fiber optic system	8
<b>Q-4</b>	<b>Attempt all questions</b>	<b>(14)</b>
	a. Enlist the various types of semiconductors specially used for designing optical sources and detectors.	2
	b. Explain the functioning, structure and applications of Laser diode. Discuss the modes and threshold conditions in relation to increase its efficiency.	8
	b. Describe; (i.) Waveguide dispersion (ii) Material dispersion	4



<b>Q-5</b>	<b>Attempt all questions</b>	<b>(14)</b>
a.	Write short notes on : i. Optical fiber connectors ii. P-I-N photodetector	<b>8</b>
b.	What do you mean by wideband? Write a technical note on ‘Wideband Optical Amplifier’	<b>6</b>
<b>Q-6</b>	<b>Attempt all questions</b>	<b>(14)</b>
a.	Write brief notes on: i. Eye diagrams ii. Raman Amplifier	<b>8</b>
b.	Explain the OTDR	<b>6</b>
<b>Q-7</b>	<b>Attempt all questions</b>	<b>(14)</b>
a.	Explain homodyne and heterodyne detection phenomena and concepts. Use suitable examples, formulae and draw necessary figures to describe.	<b>8</b>
b.	Describe passive optical couplers.	<b>6</b>
<b>Q-8</b>	<b>Attempt all questions</b>	<b>(14)</b>
a.	Enlist active optical components. Explain any two with help of suitable figures/diagrams.	<b>6</b>
b.	Write short note on : (i) Lensing schemes (ii) Link power budget	<b>8</b>

