Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

ME - SEMESTER– II (Old course) • EXAMINATION (Remedial) – WINTER- 2015

Subject Code: 1710405 **Date: 11/12/2015**

Subject Name: Fiber optic communication

Time:2:30 pm to 5:00 pm **Total Marks: 70**

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1	**(a)**	Why optical fibers are so good for communication? Discuss various generation of development of OFC system. Draw and explain block diagram of an OFC system.	**07**
	(b)	Draw & explain structure of an optical fiber. What are various types of fibers? Explain their advantages and disadvantages. For a step index fiber the normalized frequency (V number) is 26.6 at a wavelength of 1300nm. Determined the numerical aperture if the core radius is 25 µm.	**07**
Q.2	**(a)**	What do u mean by attenuation? Explain various mechanism responsible for attenuation in optical fiber. How these losses can be minimize??	**07**
	(b)	Differentiate between intermodal and intramodal dispersion. what is the effect of dispersion on performance of OFC system? For a step index fiber whose NA=0.275, core refractive4 index of 1.48. calculate how much light pulse will spread after travelling along 5 km.	**07**
		OR	
	(b)	What do you mean by material dispersion? How it affect the performance of a single mode fiber? Explain dispersion shifted fibers in brief.	**07**
Q.3	**(a)**	Write short note on (1) Population inversion (2) Carrier & optical confinement in semiconductor laser	**08**
	(b)	Explain (1) Mode hopping (2) Hetro junction (3) Spontaneous emission	**06**
		OR	
Q.3	**(a)**	Write short on ñoptical amplifierò	**07**
	(b)	Write short note on ñOTDRò	**07**
Q.4	**(a)**	Compare (1) LED & LASER (2) Photo diode & avalanche photo diode	**08**
	(b)	Write short note on various LED efficiencies with derivations	**06**
		OR	
Q.4	**(a)**	Explain (1) Dark current noise (2) Quantum noise (3) Responsivity (4) Stimulated emission	**08**

	(b)	Explain any one LED structure	**06**
Q.5	**(a)**	Write short note on óWDM Systemô	**07**
	(b)	Explain various splicing techniques in optical fiber	**07**
		OR	
Q.5	**(a)**	Write short note on óoptical switchesô	**06**
	(b)	Explain (1) Optical link design (2) Power penalties	**08**

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