Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

M. E. - SEMESTER – I • EXAMINATION – WINTER 2012

Subject code: 710405N **Date: 17-01-2013**

Subject Name: Fiber Optic Communication

Time: 02.30 pm – 05.00 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)**	Define (i) Fiber Optic Modes (ii) Fiber Birefringence. (iii) Attenuation in Fiber.	**07**
	(b)	Explain in Brief (i) Faraday Rotator (ii) Fiber Materials (iii) SRS (Simulated Raman Scattering)	**07**
Q.2	**(a)**	Explain different Modes in step index fiber.	**07**
	(b)	What are speciality fibers and explain Erbium-doped fiber.	**07**
		OR	
	(b)	Explain setup for a Raman Amplification System.	**07**
Q.3	**(a)**	Write short note on 2×2 Fiber Coupler.	**07**
	(b)	What is meant by Optical Time Domain Reflectometer? Explain OTDR in detail with required diagram and sketch.	**07**
		OR	
Q.3	**(a)**	Explain Reach- through APD with neat sketch and necessary equations.	**07**
	(b)	Explain any three-power panelities in optical fiber**.**	**07**
Q.4	**(a)**	Explain Laser diode rate equation.	**07**
	(b)	A digital optical fiber communication system operating at a wavelength of 1 µm requires a maximum bit error rate 10^{-9} . Determine minimum incident optical power at the detector in order to achieve the above bit error rate when system is employing ideal binary signaling at 10Mbits/s and assuming the detector is ideal.	**07**
		OR	
Q.4	**(a)**	What is DWDM & CWDM? Write a short note on WDM.	**07**
	(b)	What is self phase modulation? Explain in detail what is its effect for propagating light wave through fiber cable.	**07**
Q.5	**(a)**	Explain GVD and Solitons.	**07**
	(b)	Compared and contrast using suitable diagram the outside vapour –phase oxidation process & modified chemical vapor deposition (MCVD) technique for the preparation of low cost fiber.	**07**
		OR	
Q.5	**(a)**	Explain Plasma Activated Chemical Vapour Deposition Process for fiber fabrication in detail.	**07**
	(b)	Consider an EDFA being pumped at 980nm with 30 mW pumped power. If the gain at 1550nm is 20db then calculate maximum input power.	**07**

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