

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. **07**
(iii) Attenuation in Fiber.
- (b) Explain in Brief (i) Faraday Rotator (ii) Fiber Materials **07**
(iii) SRS (Simulated Raman Scattering)
- 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 10Mbps/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**
