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GUJARAT TECHNOLOGICAL UNIVERSITYBE - SEMESTER-VI • EXAMINATION – WINTER 2013

Subject Code: 161005 Date: 04-12-2013 **Subject Name: Optical Communication** Time: 02:30 pm to 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. (a) Give optical spectral bands and explain it also draw optical windows and 07 **Q.1** explain it. (b) Give difference between graded index and step index also define birefringence 07 and V number 0.2 (a) Explain attenuation in optical fiber with required figure and equation Also give 07 comparison of intermodal and intramodal dispersion (b) List the methods used to reduce the dispersion in the Fiber optics 07 communication and explain it. OR (b) What is scattering Losses List the methods used to reduce the scattering losses 07 in the Fiber optics communication and explain it. Q.3(a) A optical fiber have relative refractive index difference of 0.45% and 07 acceptance angle for the fiber in 0.115 radian. Find the speed of light in the fiber core. (b) List the types of Light Emitting Diodes used in optical system and explain any 07 one of them with required figure. OR Q.3 (a) A multimode step index fiber have core diameter of 60 µm and relative 07 refractive index difference is 1%. Operates on the wavelength of 0.8 µm. If refractive index of core is 1.5 determine normalized frequency and number of approximate modes it will support. (b) List the different types of lensing schemes used in optical system and explain 07 it. **Q.4** (a) List the types of photo detector used in optical system and explain structure 07 and operating principle of any one in detail. (b) List the factors that decides the performance of optical reception and explain it. 07 Also draw and explain eye diagram in detail. (a) Draw the point to point link of optical communication system and explain it 07 **Q.4** for calculating Link budget equation. **Q.4** (b) List the types of optical amplifier used for optical system and explain any one 07 of them in detail. (a) With the help of necessary figure properly explain DWDM in detail. **07** 0.5What is optical coupler? Draw and explain optical coupler in detail. 07 OR (a) Draw and Explain set ups for the measurements of the attenuation. 07 **Q.5 (b)** Draw and explain set ups for the measurements of the dispersion. 07
