UIET,Panjab University, Chandigarh

FIBER OPTICAL COMMUNICATION SYSTEM

BE (ECE) – 6TH Sem (section- 1,2)

Max Marks: 30 **Time Allowed: 90 min**

Note: All questions are compulsory.

Q1. Explain following

a) what is the bit duration for each of the following signals which have a bit rate of 64Kb/s,5Mb/s, and 10Gb/s.

b) Differentiate between phase velocity and group velocity associated with optical wave guiding of light through fibers.

c) A 50km long optical fiber has a total attenuation of 24dB. If 500μW of optical power gets launched into the fiber, what is the optical power level in demand and in μW?

d) Why nonlinear effects occur in optical fibers? How can these be minimized? (4x2)

Q2. Explain basic block diagram and role of various elements of an OFC system. (5)

Q3.(a) Explain the mode theory for circular waveguides with key model concepts.

(b) In multimode step index fiber has a core radius of 25um, a core index of 1.48 and an index difference 0.01. What are the number of modes in the fibre at wavelengths 860nm, 1310nm, and 1550nm ? (4,3)

Q4. Explain various steps involved in fusion splicing of optical fibers. How is fusion splicing better than mechanical splicing? (5)

Q5. Describe various types of linear and non-linear scattering losses in optical fibers. How non-linear scattering can be avoided in optical fibers? (5)