2054

B.E. (Electronics and Communication Engineering)
Sixth Semester
EC-602: Fiber Optic Communication System

Time allowed: 3 Hours   Max. Marks: 50

NOTE: *Attempt five questions in all, including Question No. I which is compulsory and selecting two questions from each Unit.*

x-x-x

I.   Attempt the following:-

    a) Calculate Carrier Frequency for Optical Communication System operating at 1.3 micro meters.

    b) Define Numerical aperture.

    c) How does non-linear effects affect the signal propagation in optical fiber?

    d) Define non radiative recombination.

    e) What is the principle behind optical switch?   (5x2)

UNIT - I

II.   a) List the advantages and disadvantages of Optical Communication. Further explain the elements of Optical Communication System.

    b) Differentiate between db and dBm.   (2x5)

III. a) Explain the basic laws that govern light to be transmitted through the Optical Communication System?

    b) Differentiate between step index and graded index fibers.   (2x5)

IV.   a) A multimode fiber with 50 micro meter core diameter is designed to limit the intermodal dispersion to 10ns/km. what is the numerical aperture of this fiber? What is the limiting bit rate for transmission over 10 km at 0.88 micro meters? Assume Refractive index of cladding as 1.45.

    b) Output power is not directly proportional to input power in optical fibers and disproportion attenuation occurs at high optical power level. Explain in detail the phenomena responsible for it?   (2x5)

P.T.O.

UNIT - II

V.   a) Draw and explain the schematic of a surface emitting LED with a double hetero structure geometry.

b) Calculate the responsivity of a p-i-n photodiode at 1.3 and 1.55 micro meter if the quantum efficiency is 80%. Why is photodiode more responsive at 1.55 micro meters?

(2x5)

VI. a) How does WDM lightwave system works?

b) Explain the OSNR, eye diagram and BER as system performance parameters.   (2x5)

VII. Write short note on:-
   a) Optical coupler
   b) Optical Add / Drop Multiplexer   (2x5)

x-x-x