

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -2 EXAMINATION- 2024

B.Tech-VII Semester (CSE/IT/ECE/CE/BT/BI)

COURSE CODE (CREDITS):18B1 WPH732 (3)

MAX. MARKS: 25

COURSE NAME: Optical Fiber Network Design

COURSE INSTRUCTORS: SKK

MAX. TIME: 1 Hour 30 Minutes

*Note: (a) All questions are compulsory.*

*(b) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems*

Q.No	Question	CO	Marks
1	Light traveling in air strikes glass plate with an angle of incidence of 57 degrees. If the reflected and transmitted beams are orthogonal, calculate the refractive index of the glass and the critical angle for total internal reflection, if beam travels from glass to air	CO-2	3
2	Determine the mode parameter V of a 50/120 step index fiber at 820 nm having core refractive index of 1.47 and cladding refractive index of 1.45. Also calculate the number of modes in this fiber at 1300 nm.	CO-2	3
3	Consider a circular LED source with 62.5 micrometer diameter. Calculate the coupling efficiencies i) Into 50/125, 62.5/125 and 100/140 SI fiber with NA=0.2 ii) Into 50/125, 62.5/125 and 100/140 GI fiber with NA(0)=0.2 and g=1.8	CO-3	5
4	Differentiate the working of photo diodes and PIN diode as detectors	CO-2	3
5	Calculate the coupling efficiency for a 50/125 SI fiber if the longitudinal displacement is 10% and NA=0.2	CO-3	3
6	Why is Manchester Code a RZ code and how is it better than NRZ and other RZ codes.	CO-2	3
7	Consider a star network with connector loss of 1.5 dB per connector pair and insertion loss per channel 0.75 dB, calculate the system loss for N=10, ignoring fiber loss and system margin	CO-4	3
8	Consider a 20 station liner data bus with connector loss of 1 dB per connector, coupling fractions of 5% at each arm of coupler, insertion loss of 2 dB per coupler, fiber loss of 3dB/km and station spacing of 1 Km, Calculate the ratio of $P_{1,20}/P_f$ in dB	CO-4	5