

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -1 EXAMINATION- 2024

B.Tech-VII Semester (All Branches)

COURSE CODE(CREDITS): 18B1WPH732(3)

MAX. MARKS: 15

COURSE NAME: Optical Fiber Network Design

COURSE INSTRUCTORS: SKK

MAX. TIME: 1 Hour

Note: (a) All questions are compulsory.

(b) Marks are indicated against each question in brackets.

1. Explain the concept of cutoff wavelength in an optical fiber. Calculate cutoff wavelength of a single mode 8/120 fiber with core index of 1.467 and fraction of 2.3%.
(1+2)
2. Why do we have multiple radius of core in multimode graded index fiber?
(2)
3. Consider a 16/125 single mode fiber operating at 1300nm with a loss of 0.8 dB/Km. The line width of the source is 0.013nm. Calculate the power levels in Watts for which the non linear scattering will be ineffective.
(1.5+1.5)
4. What is the basic design difference in optical fiber cable when in use on surface and above surface with suitable diagrams?
(1+2)
5. Consider a GI fiber with linear slope of refractive index having a 50 μ m core diameter and a 100 μ m cladding diameter. For $n_1 = 1.48$ and $\Delta = 1\%$, calculate the number of modes if the operating wavelength is 800 nm and 950 nm
(1+1.5+1.5)