

DAYANANDA SAGAR COLLEGE OF ENGINEERING
(An Autonomous Institute Affiliated to VTU, Belagavi)
 ShavigeMalleshwara Hills, Kumaraswamy Layout, Bengaluru-560078
Department of Telecommunication Engineering
Internal Assessment Test – CIE-1-ONLINE

Course: Optical communication and Networks

Maximum marks: **50**

Course Code: 17TE7GCOCN

Duration :90 min

Semester: VII SEM A &B

Date:5/10/2020

Note: Maximum of 4 sub questions are allowed.		Marks
1	<p>i. What does micro-bending losses depend on? (a) Core material (b) Refractive index (c) Diameter (d) Mode and wavelength</p> <p>ii. In an optical fiber, the concept of Numerical aperture is applicable in describing the ability of _____ (a) Light Collection (b) Light Scattering (c) Light Dispersion (d) Light Polarization.</p> <p>iii. In a step index fiber and graded index fiber the core refractive index (a) In step index fiber the core is uniform throughout and undergoes an abrupt change at the cladding boundary. (b) The core refractive index is made to vary as a function of the Radial distance from the center of the fiber. (C) Both (a) & (b) (d) None of these.</p> <p>iv. The core of an optical fiber has a (a) Lower refracted index than air (b) Lower refracted index than the cladding (c) Higher Refractive index than the cladding (d) similar refractive index with the cladding.</p> <p>v. The critical angle of incidence is the angle (a) The angle of incidence that causes the refracted light to travel along the interface between the two different mediums. (b) Minimum angle of incidence at which the ray strikes the interface of 2 media and causes an angle of refraction equal to 90°. (c) Both (A) & (B) (d) None of these.</p> <p>vi. Which rays exhibit the variation in the light acceptability ability of the fiber? (a) Meridional rays (b) Skew rays (c) Leaky (d) All of the above.</p> <p>vii. If a light travels in a certain medium and it gets reflected off an optically denser medium with high refractive index, then it is regarded as _____ (a) External Reflection (b) Total Internal Reflection (c) Both a and b (d) None of the above</p> <p>viii. Snell's law relates _____. (a) Light reflection (b) Light refraction (c) Light transmission (d) Light Absorption</p> <p>ix. Which kind of dispersion phenomenon gives rise to Pulse spreading in single mode fibers.</p>	1x10

	(a) Intramodal (b) Intermodal (c) Material dispersion (d) Group velocity. x. _____ is also referred to as on-off keying (OOK). (a) FSK (b) DSK (c) PSK (d) ASK	
2	Describe the structure of single mode and multimode step index and graded-index optical fibers with cross section and ray path.	10
3	Describe briefly the Fabry Perot Resonator cavity for a laser diode with neat diagrams.	10
4	Deduce the ray theory equations of optical fiber with the help of a neat sketch and also deduce the equations for Acceptance angle and derive the numerical aperture of a step index fiber (SIF) from snell's law.	10
	(OR)	
5	a) Discuss briefly Macro-bending and Micro-bending losses with neat diagrams. b) Discuss briefly Mode Field Diameter (MFD) of a single mode fiber.	10
6	Summarize the principle of Avalanche-Photodetectors with diagram and equations.	10
	(OR)	
7	a) Light travelling in air strikes a glass plate at an angle $\theta_1=33^\circ$, where θ_1 is measured between the incoming ray and glass surface. If the refracted and reflected beams make an angle of 90° with each other, what is the refractive index of the glass? b) Define critical angle? b) Analyze the following data for a 30km long fiber at 1300nm has an attenuation of 0.8db/km. If 200 μ w input power is launched into the fiber; find the output power in dbm and in watts.	10

Staff Incharge: Mr JC

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