	ADAMAS UNIVERSITY		
	END-SEMESTER EXAMINATION: MAY 2021		
	(Academic Session: 2020 – 21)		
Name of the Program:	B.Tech.	**Semester:**	VI
Paper Title:	Elective-III (Fiber Optics Technology)	**Paper Code:**	EEC43112
Maximum Marks:	40	**Time duration:**	3 Hours
Total No of questions:	08	**Total No of Pages:**	02
	Note: 1. Follow all the Instructions given on the cover page of the Answer Booklet Strictly. 2. All parts of a Question should be answered consecutively. 3. Each answer should start from a fresh page. 4. Assumptions made if any, should be stated clearly at the beginning of your answer.		

Answer all the Groups
Group A
Answer all the questions of the following $5 \times 1 = 5$

1. **a)** What the inside vapour phase oxidation process can be termed?
    b) Write down Urbach rule?
    c) What are the primary reasons for the wide spread use of the plastic fibers?
    d) How does Scattering occur in an optical fiber?
    e) What are elements of ZBLAN?

GROUP –B
Answer *any three* of the following $3 \times 5 = 15$

2. A typical relative r.i. difference for an optical fiber designed for long distance transmission is 1%. Estimate NA and the solid acceptance anglein air for the fiber when the core index is 1.46. Further calculate the critical angle at the core-cladding interface within the fiber. It may be assumed that the concepts of geometric optics hold for for the fiber.   [3+2]

3. Design and explain the operation of different types of optical fiber based on BW, r.i and wave length of propagation.

4. A Si optical fiber with a core diameter large enough to be considered by ray theory analysis has a core r.i. of 1.5 and cladding r.i. of 1.47.

a) Determine the critical angle at the core-cladding interface

b) The NA for the fiber

c) The acceptance angle in air for the fiber.   [2+2+1]

5. Derive the expression of dispersion parameter.

GROUP –C

Answer *any two* of the following $2 \times 10 = 20$

6.   Drive the expression of power radiated in solid angle in an optical fiber
7.   Discuss about the propagation mechanism and conditions of light in an optical fiber.

[5+5]

8.   a) Drive the mathematical expression of NA and acceptance angle.
b) Calculate the number of modes of an optical fiber having diameter of 50 μm, core r.i. $n_1=1.48$, cladding r.i. $n_2=1.46$ and $\lambda= 0.82$ μm.   [5+5]

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