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B.TECH
(SEM VII) THEORY EXAMINATION 2020-21
OPTICAL COMMUNICATION

Time: 3 Hours**Total Marks: 100****Note:** Attempt all Sections. If require any missing data; then choose suitably.**SECTION A****1. Attempt all questions in brief. 2 x 10 = 20**

a.	Define effective aperture.
b.	Explain the necessary actions required for laser action to take place.
c.	Explain the importance of multiplication factor in avalanche photodiodes.
d.	Illustrate receiver selectivity and sensitivity.
e.	What are advantages of optical communication.
f.	What is skew ray propagation.
g.	What is Kerr effect in an optical system?
h.	Give importance of critical radius of curvature in bending loss.
i.	What is the use of EYE diagram?
j.	Define Bending Loss.

SECTION B**2. Attempt any three of the following: 10x3=30**

a.	Explain Quantum efficiency.
b.	Explain the modes in an optical fiber; also give field pattern of modes having different order.
c.	Describe the working principle and structure of heterodyne detection.
d.	Derive rms pulse broadening due to material dispersion in an optical fiber with brief explanation of chromatic dispersion. Also, explain overall fiber dispersion in a single mode fiber.
e.	Explain Phase Velocity and Group Velocity with proper derivation.

SECTION C**3. Attempt any one part of the following: 10x1=10**

a.	Explain all the sources of noise in photo detection.
b.	Explain the working of PIN photo detector.

4. Attempt any one part of the following: 10x1=10

a.	Differentiate between Dispersion shifted fibers and Dispersion flattened fibers.
b.	Explain Fiber Birefringence.

5. Attempt any one part of the following: 10x1=10

a.	Clearly explain all the power penalties in optical communication.
b.	Explain the working of Front-End Amplifier.

6. Attempt any one part of the following: 10x1=10

a.	Briefly discuss Linear and Non-Linear Scattering Losses in an optical fiber.
b.	Explain the various structures of LED, also explain SLED in detail with proper diagram.

7. Attempt any one part of the following: 10x1=10

a.	What are the different error sources in optical communication?
b.	Derive and explain all the Laser diode rate equations.