IV B.Tech I Semester Regular/Supplementary Examinations, Jan/Feb - 2022
OPTICAL COMMUNICATIONS
(Electronics & Communication Engineering)

Time: 3 hours   **Max. Marks: 70**

Question paper consists of Part-A and Part-B
Answer ALL sub questions from Part-A
Answer any FOUR questions from Part-B
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PART–A *(14 Marks)*

1. a) Define cut-off wave length.   [3]
    b) Define Group delay.   [2]
    c) Classify the fiber connectors.   [2]
    d) Define External Quantum Efficiency.   [2]
    e) List out the differences between optical transmission and digital signal   [3]
        Transmission.
    f) List out the techniques to measure attenuation & dispersion.   [2]

PART–B *(4x14 = 56 Marks)*

2. a) Explain the basic optical communication system with suitable diagram.   [7]
    b) Explain the designing procedure of Step Index fibers and Graded Index fibers.   [7]

3.   Write a notes on i) Bending losses ii)Pulse broadening in graded index fiber   [14]

4. a) Discuss about fiber alignment and joint losses in optical fibers.   [7]
    b) A graded index fiber has a parabolic refractive index profile ($\alpha=2$) and a core   [7]
        Diameter   of   500µm. Estimate   the   insertion   loss due to a 5 µm lateral
        Misalignment at a fiber joint when there is index matching and assume there is
        uniform illumination of all guided modes only.

5. a) Explain the working principle of Dome LED and surface emitting LED.   [7]
    b) Explain the modes in Laser diode.   [7]

6. a) Explain the working principle of analog receiver.   [7]
    b) Derive the equations of probability error in the digital system.   [7]

7.   Write about   [14]
        i)NRZ codes ii) RZ codes iii)Dispersion measurement

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