Code No: **R1641044**

R16

Set No. 1

IV B.Tech I Semester Supplementary Examinations, February- 2020
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) Mention the main constituents of Optical fiber communication link. [2]
    b) Define micro bending and macro bending losses. [2]
    c) Classify fiber joints. [2]
    d) Write Laser diode rate equation. [2]
    e) What effects do you observe by LASER diode to fiber coupling? [3]
    f) Define rise time budget. [3]

PART–B*(4x14 = 56 Marks)*

2. a) Explain the ray theory of Optical fiber with help of a neat sketch. [7]
    b) Explain the structure of single mode, multi-mode step index and graded-index optical fibers with cross-section and ray path. [7]

3. a) Explain different types of absorption losses in optical fibers. [7]
    b) Discuss about signal distortion and material dispersion..

    [7]

4. a) Explain the different mechanical splicing techniques. [7]
    b) Explain the different types of optical fiber connections used. [7]

5. a) Discuss different types of noise which occur in photo detectors. [7]
    b) Derive the equation for internal quantum efficiency, optical power and external quantum efficiency of LED. [7]

6. a) Explain the possible launching schemes used to improve optical source to fiber coupling efficiency. [7]
    b) Explain the receiver sensitivity of an optical receiver. Derive an expression for receiver sensitivity. [7]

7. a) Explain the features of WDM and give an example of WDM component. [7]
    b) Draw the optical power loss model diagram for a point-to-point link and explain the concept of link power budget. [7]

1 of **1**

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