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## SAINTGITS COLLEGE OF ENGINEERING KOTTAYAM, KERALA

(AN AUTONOMOUS COLLEGE AFFILIATED TO  
APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY, THIRUVANANTHAPURAM)

### FIRST SEMESTER M.TECH. DEGREE EXAMINATION (R), MARCH 2021 (TELECOMMUNICATION ENGINEERING)

**Course Code:** 20ECTET111**Course Name:** OPTICAL COMMUNICATION SYSTEMS**Max. Marks:** 60**Duration:** 3 Hours

#### PART A

*(Answer all questions. Each question carries 3 marks)*

1. Outline the concept of Numerical Aperture with Equation.
2. Draw the cross-sectional view of Optical fiber and briefly explain its parts.
3. Explain briefly about PIN Photo Diode.
4. List the Categories of Various Light wave system Architecture .
5. Discuss about the basic concepts of Optical Amplifier.
6. Explain DCF fiber concept in Dispersion Management.
7. Briefly explain Soliton Based System.
8. Define WDM Light wave system.

#### PART B

*(Answer one full question from each module, each question carries 6 marks)*

##### MODULE I

9. Describe the principles behind optical fiber cable and explain the various Fiber Losses in detail (6)

**OR**

10. Explain the VCSEL laser with neat diagrams in detail (6)

##### MODULE II

11. Explain the principle of PIN Photo Detector with necessary diagrams. (6)

**OR**

12. Explain the various issues related to the design of optical receiver with necessary diagram. (6)

##### MODULE III

13. Explain the architecture of Point to Point and Distributed Light Wave System. (6)

**OR**

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14. Discuss the Design issues in OFC with Loss limited Fiber System (6)

## MODULE IV

15. Explain EDFA in detail with necessary diagrams (6)

## OR

16. Describe the Raman amplifier with neat diagrams (6)

## MODULE V

17. a) Explain the formation of soliton pulses. (6)  
b) Estimate the peak power requirement of 100ps soliton to be propagated in a fiber dispersion parameter of 2ps/nm-km and a non-linearity co-efficient of 20 rad/W-km. Take  $\lambda=1550\text{nm}$

## OR

18. Explain the basics of Soliton and Timing Jitter in detail (6)

## MODULE VI

19. Describe the WDM components and its applications. (6)

## OR

20. Explain the concepts of coherent light wave system. (6)

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