PVP 14

Code: EC7T1

IV B.Tech - I Semester –Regular / Supplementary Examinations
JANUARY - 2022

OPTICAL COMMUNICATIONS
(ELECTRONICS & COMMUNICATION ENGINEERING)

Duration: 3 hours Max. Marks: 70

PART – A

Answer ***all*** the questions. All questions carry equal marks

11 x 2 = 22

1.

a) What are the advantages and disadvantages of optical fibers?
b) What is acceptance angle? Why do we need to know this angle?
c) Mention attenuation constant of a fiber.
d) Define waveguide dispersion.
e) List the absorption losses in fiber optic communications.
f) What are the applications of LED?
g) State the impact of fiber birefringence.
h) Define optical detection noise.
i) State the principle of WDM networks.
j) What do you understand by attenuation measurement?
k) What is RI of a material?

PART – B

Answer any ***THREE*** questions. All questions carry equal marks.
3 x 16 = 48

2. a) Draw the block diagram of an optical fiber link transmission and explain the different components. 6 M

b) State ray theory behind the optical fiber communication with a special mention about the total internal reflection, Acceptance angle and Numerical aperture. 6 M

c) Describe single mode fibers and their mode- field diameter. 4 M

3. a) What are the types of linear scattering loss? Explain in detail. 8 M

b) Discuss in detail Intramodel dispersion, Intermodel dispersion in optical fibers. 8 M

4. a) Draw and explain the structure of Fabry Perot resonator cavity for a Laser diode. Derive Laser dioderate equation. 8 M

b) Explain the structure of Surface Emitting LED and Edge Emitting LED. 8 M

5. a) Describe the constructional features of APD and explain the principle of operation. 10 M

b) Explain the concepts of Responsivity and efficiency of optical detectors. 6 M

6. a) Model the Layered architecture of SONET/SDH with neat diagram. 8 M

b) Identify the OTDR and list its applications. 8 M