Roll No. | | | | | | | | | | | |

Total No. of Pages: 02
Total No. of Questions: 09

B.TECH (ETE)(ECE)(Sem.-7th)

OPTICAL COMMUNICATION

Subject Code: BTEC-702
Paper ID: [A3001]

Time: 3 Hrs. **Max. Marks: 60**

INSTRUCTIONS TO CANDIDATE:

1. **Section-A is compulsory.**
2. **Section-B Attempt any four questions.**
3. **Section-C Attempt any two questions.**

SECTION-A

Q.1. **(10x2=20)**

(a) What is the need of optical communication?

(b) Define splicing.

(c) Define modal noise.

(d) Define the term sensitivity.

(e) Define critical angle.

(f) Define the term distortion factor.

(g) Define mode-field diameter.

(h) What is the operating wave length window for optical communication?

(i) State the two analyses usually carried out to ensure the desired performance of optical fibre transmission link?

(j) What is the main function of optical multiplexing?

Section-B **(4x5=20)**

Q.2. Differentiate the following: (a) step-index fiber and graded index fibre; (b) LED and LASER.

Q.3. Define Numerical Aperture. Derive the NA= $n\sqrt{(2\Delta)}$.

Q.4. Explain the mechanism of optical feedback to provide oscillation and hence amplification within the LASER. Also define the term "population inversion" in connection with LASER?

Q.5. Compare the PIN and APD photo detectors on the basis of their working, advantages, disadvantages and applications.

Q.6. Calculate the core radius and cladding refractive index of a step-index silicon fibre having NA=0.3, V=75, n_1=1.5 and it is to be operated at 850nm.

Section-C (2x10=20)

Q.7. Define the term non-linear effects. Explain the various non-linear effects in optical fibre communication along with the ways of reducing them.

Q.8. Explain the concept of WDM and also the key system features of WDM with the Help of a suitable block diagram.

Q.9. Explain the convenient budget analysis for determining the power limitation of an optical fibre link.

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