Seat No.

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MAR_APR 2025 SUMMER EXAMINATION

11731 Bachelor of Technology (NEP-2.0)

Sub. Name: Optical Communication

Sub. Code: 80810/81068

Day and Date: MAY ,09-05-2025 **Total Marks: 70**

Time: 02:30 PM To 05:00 PM

Instructions:
1. **All questions are compulsory**
2. **Assume suitable data wherever necessary and mention it boldly**
3. **Draw neat labelled diagrams wherever necessary**
4. **Figures to the right indicate full marks**

Q1) Solve following MCQ. **[14]**

i. Multimode step index fiber has _____
- A. Large core diameter & large numerical aperture
- B. Large core diameter and small numerical aperture
- C. Small core diameter and large numerical aperture
- D. Small core diameter & small numerical aperture

ii. In single mode fibers, which is the most beneficial index profile?
- A. Step index
- B. Graded Index
- C. Step and graded index
- D. Coaxial cable

iii. The optical source used for detection of optical signal is _____
- A. IR sensors
- B. Photodiodes
- C. Zener diodes
- D. Transistors

iv. Polarization modal noise can _____ the performance of communication system.
- A. Degrade
- B. Improve
- C. Reduce
- D. Attenuate

v. _____ is an example of a static circuit-switched network.
- A. OXC
- B. Circuit regenerator
- C. Packet resolver

D. SDH/SONET

vi. Which law gives the relationship between refractive index of the dielectric?

A. Law of reflection
B. Law of refraction (Snell's Law)
C. Millman's Law
D. Huygen's Law

vii. Absorption losses due to atomic defects mainly include _____

A. Radiation
B. Missing molecules, oxygen defects in glass
C. Impurities in fiber material
D. Interaction with other components of core

Q2) Solve any two……[2 × 7 = 14] **[14]**

a. Explain Skew rays and Meridional rays **[7]**

b. With the help of neat diagram explain step index and graded index glass fiber? Give their comparison. **[7]**

c. Explain Polarization maintaining fibers **[7]**

Q3) Solve any two……[2 × 7 = 14] **[14]**

a. Explain different indoor and outdoor fiber optic cables **[7]**

b. A multimode step-index fiber with a core diameter of 80 μm and a relative index difference of 1.5 % is operating at a wavelength of 0.85 μm. If the core refractive index is 1.48, estimate (a) the normalized frequency for the fiber; (b) the number of guided modes. **[7]**

c. Explain in detail non linear scattering losses **[7]**

Q4) Solve any two……[2 × 7 = 14] **[14]**

a. Explain the structure of distributed feedback (DFB) laser diode. **[7]**

b. Explain the term Avalanche Multiplication Noise **[7]**

c. Explain operating principles of WDM, Write different WDM standards? **[7]**

Q5) Solve any two……[2 × 7 = 14] **[14]**

a. Explain Mach Zehnder Interferometer **[7]**

b. Explain in detail Optical Burst Switching (OBS) and Optical Packet switching(OPS) **[7]**

c. Explain front end amplifier with diagram **[7]**

End Of Question Paper

Important Note for Chief Exam Officer / SRPD Coordinator / Sr Supervisor/ Student -
This Question Paper may be distributed for following Subjects as common code.
सदरची प्रश्नपत्रिका खालील विषयांकरिता वितरित करता येईल.

1] (1154) B.Tech. CBCS (80810) Optical Communication Part 3 SEM 5

2] (101) Bachelor of Engineering (81068) Optical Communication Part 3 SEM 5