

B.Sc. Semester - 3 (NEP-2020) Examination

OCT/NOV-2025

PHY: Fundamentals of Optical and Electronic Communications (Major-5)

Time: 2:00 Hours

Marks:50

Instructions:

1. All questions are compulsory.
2. Figures to the right indicate marks.

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- Que.1 Answer any 2 out of 3 of the following questions. (10)
- (1) Explain three types of fibre in detail.
 - (2) Derive an expression for acceptance angle of the fibre optics.
 - (3) Derive an expression for critical angle of the fibre optics.
- Que.2 Answer any 2 out of 3 of the following questions. (10)
- (1) Explain three-level and four-level pumping schemes.
 - (2) Explain the Nd-YAG LASER.
 - (3) Explain the construction and working of He-Ne LASER.
- Que.3 Answer any 2 out of 3 of the following questions. (10)
- (1) What is phase reversal? Explain it in detail with a graphical demonstration.
 - (2) Explain amplifier equivalent circuit and derive power gain using signal source.
 - (3) Explain Load Line analysis.
- Que.4 Answer any 2 out of 3 of the following questions. (10)
- (1) What is modulation? Discuss the need for modulation.
 - (2) Explain the Frequency Modulation.
 - (3) Define demodulation and explain demodulation detector.
- Que.5 Answer any 5 out of 8 of the following (10)
- (1) Explain Fiber Optics in brief.
 - (2) Define total internal reflection and explain propagation of light in optical fibre.
 - (3) Write the differences between spontaneous emission and stimulated emission.
 - (4) What is the optical resonance cavity?
 - (5) Explain the practical circuit of transistor amplifier.
 - (6) Discuss classification of amplifiers in brief.
 - (7) What is amplitude modulation?
 - (8) Write the differences between FM and AM.
