647510 BSCphMJ205x-3C Seat No :_____

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.

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.

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