Name:.....
Roll No:.....

MAR ATHANASIUS COLLEGE OF ENGINEERING
KOTHAMANGALAM – 686666
(Govt. Aided Autonomous Institution)
DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

B. TECH SECOND SERIES EXAMINATION, OCTOBER ,2026
(S5 ECE A &B) B24EC3P13-OPTICAL FIBER COMMUNICATION

Max. Marks: 40 Duration: 1.5 Hours

PART A

Answer all questions. Each question carries 3 marks.

1. How LED is differ from laser diode.Write any 5 differences. (CO3)

2. Could you provide a comparative breakdown of modal noise, mode partition noise, and reflection noise in laser diodes, highlighting their primary causes, effects on optical systems, and how they differ from one another (CO3)

3. What specific features make Semiconductor Optical Amplifiers suitable for modern optical networks (CO4)

4. Write the expression for cavity gain and 3 dB spectral bandwidth of SOA and elaborate each term. (CO4)

PART B

Answer all questions. Each question carries 14 marks.

5. a. For an AlGaAs-based heterostructure laser diode having cavity length of 200 μm, (CO3)

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radiation wavelength of 870 nm, and refractive index of GaAs is about 3.7, calculate the mode integer q of the peak radiation and the separation between the modes of cavity. If the optical gain bandwidth is 6 nm, how many modes are there within this bandwidth? (7 Marks)

b. How the Gain Guided laser operates ,Explain with neat diagram. (7 Marks) (CO3)

6. a. With the help of diagram ,Explain the Fabry - Perot Amplifier and TWAs (10 Marks) (CO4)

b. A semiconductor optical amplifier has facet reflectivities of 30% and a single -pass gain of 5 dB .The device has an active region of length 350 μm,a mode spacing of 1 nm, peak gain wavelength is 1550 nm .Calculate the refractive index of active region. (4 Marks) (CO4)

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