National Institute of Technology Hamirpur (HP)

Mid Semester Examination-October, 2024

[Class: B.Tech. (1st Semester)]

Title of the Course: Engineering Physics

Course Code: PH-101

Time: 1 Hours 30 Minutes ***Maximum Marks: 30***

Note : Attempt all questions.

Q.No.1.: Explain the working of He-Ne laser with the help of energy level diagram. **(5)**

Q.No.2.: a)What is Laser? How is laser different from an ordinary light? **(1)**

b) What do you mean by spatial coherence? **(1)**

c) How can an optical fibre be used as a sensor? Write a short note on optic fibre sensor. **(3)**

Q.No.3.: a) A typical He-Ne laser emits radiation of wavelength 6328A. How many photons per second would be emited by a one milli-watt He-Ne laser? **(2)**

b) Distinguish between Three Level and Four Level lasers. **(3)**

Q.No.4.: Give the block diagram of optical fibre communication system explaining the function of different blocks. **(5)**

Q.No.5.: a) Why is the optical resonator required in lasers? **(1)**

b) What do you mean by mono-mode optical fibre? **(1)**

c) A laser beam from 100 watt source is focused on an area of 2 m^2. Evaluate the magnitude of poynting vector on the area. **(2)**

Q.No.6.: What is meant by Poynting vector? Derive Poynting vector from Maxwell's equations and explain its physical significance. **(6)**