

**NED UNIVERSITY OF ENGINEERING & TECHNOLOGY**  
FIRST YEAR/BACHELOR OF SCIENCE IN COMPUTER SCIENCE & INFORMATION TECHNOLOGY/  
COMPUTER SCIENCE & INFORMATION TECHNOLOGY SPECIALIZATION IN  
ARTIFICIAL INTELLIGENCE/ DATA SCIENCE/ CYBER SECURITY)  
FALL SEMESTER EXAMINATIONS 2022  
BATCH 2022

Time: 3 Hours

Dated: 04-02-2023

Max.Marks:60

**Applied Physics - PH-122**

**CLO-2**

1. Discuss the following with diagrams. (Max. Marks:15)
  - a. Working of laser
  - b. Working of P-N junction
2. Explain: (Max. Marks:15)
  - a. Black body radiation.
  - b. Compton effect

**CLO-3**

3. Solve the following problems: (Max. Marks:15)
  - a. A jet lands on an aircraft carrier at 72 m/s. Determine its acceleration (assumed constant) if it stops in 1.5 s due to an arresting cable that snags the jet and brings it to a stop? If the jet touches down at position  $x_i = 0$ , find its final position?
  - b. Find average, average deviation, standard deviation, standard error and probable error for the following values of radius of curvature of the surface of convex lens measured with spectrometer.

Observations	Radius of curvature
1	12.20
2	12.41
3	12.32
4	12.25
5	12.35
6	12.45

- c. Of the 600 mg of potassium in a large banana, 0.0112% is radioactive  $^{40}\text{K}$ , which has a half-life  $T_{1/2}$  of  $1.35 \times 10^9$  y. What is the activity of the banana? molar mass of potassium is 39.102 g/mol
4. Derive the following: (Max. Marks:15)
  - a. Magnetic field of solenoid.
  - b. The equation of acceleration for linear oscillator and also determines its angular frequency.