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NEPSA—2022—2025

FACULTY OF SCIENCE AND TECHNOLOGY

B.Sc. (NEP) (First Year) (Second Semester) EXAMINATION

APRIL/MAY, 2025

PHYSICS

(SPHYCT-1151)

(Fundamentals of Physics-II)

(Tuesday, 15-4-2025) **Time : 10.00 a.m. to 12.00 noon**

Time—2 *Hours* *Maximum Marks*—40

N.B. :— (*i*) Q. No. **1** is compulsory.

(*ii*) *All* questions carry equal marks.

(*iii*) Solve any *three* of the remaining five questions (Q. Nos. **2** to **6**).

(*iv*) Figures to the right indicate full marks.

1. Solve the following questions (compulsory) (**2.5** marks each) : 10

(*a*) Types of camera lenses and their use.

(*b*) Define self-inductance and write its units.

(*c*) Write the formula for resistances connected in series and parallel combination.

(*d*) Any *two* differences between solid, liquid and gaseous states of matter.

2. (*a*) Describe Huygens eyepiece and find the equivalent focal length of field lens and eye lens combination. 5

(*b*) Explain constant deviation spectrometer. 5

3. (*a*) Derive formula for self-inductance of a coil. 5

(*b*) Derive formula for self-inductance of a solenoid. 5

4. (*a*) State Thevenin's theorem and write steps to Thevenize a circuit. 5

(*b*) Describe Kirchhoff's voltage law and current law with suitable diagram. 5

5. (*a*) Derive Charle's law and show that $V \propto T$. 5

(*b*) What is kinetic model ? Write the postulates of kinetic theory of gases. 5

6. Write short notes on any *two* : 10

(*a*) Objective and eyepiece

(*b*) Mutual induction and inductance

(*c*) Concept of R, L and C elements

(*d*) Derive ideal gas equation PV = RT.