BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)

CLASS: B.SC. **SEMESTER : I**
BRANCH: CHEMISTRY **SESSION : MO/2023**

SUBJECT: PH109 PHYSICS-I

TIME: 3 HOURS **FULL MARKS: 50**

INSTRUCTIONS:
1. The question paper contains 5 questions each of 10 marks and total 50 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
***4*. Before attempting the question paper, be sure that you have got the correct question paper.**
5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.

			CO	BL
Q.1(a)	Show that Electric field is a conservative field.	[5]	1	2
Q.1(b)	Find the expression for energy density in electrostatic field.	[5]	1	1,2
Q.2(a)	Consider an infinite sheet of uniform charge density ρ_s C/m^2. Find the filed due to this sheet at a random point P.	[5]	2	3
Q.2(b)	Describe the term dielectric constant and dielectric strength.	[5]	2	1
Q.3(a)	Write the assumption of liquid drop model.	[5]	3	2
Q.3(b)	Find the density of the $^{12}C_6$.	[5]	3	2,3
Q.4(a)	Show that the Newton's dark ring radius is proportion to root of wavelength.	[5]	4	1,2
Q.4(b)	Find the wavelength of the light used if the 4th dark ring has diameter of 8 mm and radius of curvature of lens used is 90cm.	[5]	4	2,3
Q.5(a)	What do you understand by length contraction. Derive the expression. Compute the contracted length of an object whose initial length 10 m and travel with a velocity 0.75c?	[5]	5	2,3
Q.5(b)	Derive the relation between kinetic energy, total energy and rest mass energy of system for relativistic motions.	[5]	5	2

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