



UNIVERSITY OF NORTH BENGAL
B.Sc. Honours 4th Semester Examination, 2021

CC9-PHYSICS

ELEMENTS OF MODERN PHYSICS

Full Marks: 40

ASSIGNMENT

*The figures in the margin indicate full marks.
All symbols are of usual significance.*

**For each question, the candidates will be graded according to the quality of the presentation of the topic (8 marks) and originality of language (2 marks).
Maximum word limit of each topic is 400**

Write short notes on any *four* of the following topics

10×4 = 40

1. Planck's black body radiation formula and derivation of Rayleigh-Jeans and Wein's formula from it.
2. Gamma ray microscope thought experiment: Heisenberg uncertainty principle and estimation of minimum energy of a confined particle.
3. Time independent Schrödinger equation for non-relativistic particles: stationary state, probability and probability current density.
4. Liquid drop model: semi-empirical mass formula and binding energy.
5. Beta decay: energy kinematics and neutrino hypothesis.
6. Lasers: Einstein's A and B coefficients, optical pumping and population inversion.

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