SHRIMATHI DEVKUNVAR NANALAL BHATT VAISHNAV COLLEGE FOR WOMEN
(AUTONOMOUS)
(Affiliated to the University of Madras and Re-accredited with 'A+' Grade by NAAC)
Chromepet, Chennai - 600 044.
B.Sc. Physics - END SEMESTER EXAMINATIONS APRIL - 2024
SEMESTER - VI
20UPHCT6012 - Relativity and Quantum Mechanics

Total Duration : 2 Hrs. 30 Mins. Total Marks : 60

Section B

Answer any **SIX** questions $(6 \times 5 = 30$ Marks)

1. Derive an expression for Einstein's mass energy relation.
2. Obtain an expression for De Brogile's wavelength.
3. Explain in detail the postulates of wave function.
4. Give the free particle solution of Schrodinger's equation.
5. Write notes on Linear operator and self adjoint operators.
6. Derive an expression for length contraction.
7. Draw a neat diagram of an electron microscope and explain its action.
8. Discuss about the energy of a particle in a one-dimensional box.

Section C

Answer any **THREE** questions $(3 \times 10 = 30$ Marks)

9. Derive Lorentz transformation equation of motion.
10. Describe the Davisson and Germer's experiment and discuss its results.
11. Deduce Schrodinger's time independent wave equation.
12. Establish Schrodinger's equation for a linear harmonic oscillator.
13. Discuss about Schrodinger's time dependent three dimensional wave equation in terms of Hamiltonian operator.

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