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 NOVEMBER -2023
SEMESTER - II
22UPHCT2004 - Mechanics

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

Section B

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

1. Explain briefly on bifilar pendulum with a neat sketch.
2. Describe the equation for centre of gravity of a right solid cone.
3. State Bernoulli's theorem and apply it to the flow of liquid in a Venturimeter.
4. Define the term degrees of freedom and list out the various types of constraints.
5. Define Phase space and Hamiltonian function H.
6. State and explain the principle of virtual work.
7. Compute the efflux velocity of a liquid through an orifice using Torricelli's theorem.
8. Using Hamiltonian equation compute the equation of motion of a simple pendulum.

Section C

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

9. Compute the equation for minimum period of oscillation of compound pendulum and also outline on the interchangeability of centre of suspension and centre of oscillation in a compound pendulum.
10. Predict the centre of pressure of a triangular lamina immersed vertically in a liquid with
    i. Its vertex in the surface of the liquid (5 marks)
    ii. One side in the surface of the liquid (5 marks)
11. Distinguish on the various ways of the production of low pressure using vacuum pumps.
12. Deduce the Lagrange's equation of motion from D'Alembert's Principle.
13. Deduce the Hamiltonian Equation and apply it to a harmonic oscillator.

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