

Roll.No.

22UPHCT2004

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 2025

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. State the purpose of a bifilar pendulum experiment.
2. Explore the Centre of gravity of a right solid cone.
3. Explain the principle of working of a Venturimeter
4. Write a note on 'holonomic and non-holonomic constraint' with two examples of each type.
5. Define Hamiltonian function H. Give its physical significance
6. Obtain an expression for the Single Pirani gauge.
7. Describe the generalized coordinates.
8. Why is Hamiltonian formulation is preferred over the Lagrangian formulation?

### Section C

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

9. Derive the expression for time period of a compound pendulum and show that centre of suspension and oscillation are interchangeable.
10. Derive the expression for the centre of pressure of a triangular lamina immersed in a liquid.
11. Explain the construction and working of a rotary vacuum pump.
12. Derive Lagrange's equation of motion using D'Alembert's principle and apply it to a simple pendulum.
13. Derive Hamilton's equations of motion and apply them to a simple pendulum.

\*\*\*\*\*