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. - END SEMESTER EXAMINATIONS NOVEMBER - 2022
SEMESTER - II
20UPHCT2004 - Mechanics

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

Section A

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

1. Explain the experimental verification of perpendicular axes theorem using Bifilar pendulum.

2. Compute the centre of gravity of a solid hemisphere.

3. Apply the principle of Bernoulli's theorem to explain the working of venturimeter.

4. Explain generalised co-ordinates and state its advantages.

5. Illustrate the physical significance of Hamiltonian.

6. State and prove Torricelli's theorem.

7. Distinguish between centre of mass and centre of pressure.

8. A uniform thin rod of length 1 m and width 5 cm is a swinging in a vertical plane as a pendulum about a point A at some distance from one end. If the time of swing is minimum, Determine the distance of A from the end of the rod.

Section B

Part A

Answer any **TWO** questions $(2 \times 10 = 20$ Marks)

9. Explain the determination of 'g' at a place using compound pendulum.Also explain the reversibility of centre of oscillation and centre of suspension

10. (i) Show that the centre of gravity of a right solid cone is $3/4$ times its height. (II) Obtain an expression for the centre of pressure of a rectangular lamina immersed vertically in a liquid with one edge in the surface of the liquid.

11. Describe the construction and working of Pirani gausge.

12. Derive Lagrange's equations of motion form D'Alembert's principle.

Part B

Compulsory question $(1 \times 10 = 10$ Marks)

13. Deduce the equation of motion of the simple pendulum using Hamiltonian equations.

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