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 APRIL-2022
SEMESTER - II
20UPHCT2004 - Mechanics

Total Duration : 3 Hrs. **Total Marks : 60**

Section A

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

1. Revise the interchangeability of centre of suspension. Define centre of oscillation.
2. Prepare notes on centre of gravity of a right solid cone.
3. Give the examples for Bernoulli's theorem and explain Torricelli's theorem.
4. what is meant by constraints? Show holonomic and non – holonomic constraints with examples.
5. Define phase space. Identify the Hamiltonian function H.
6. Apply the conditions for minimum period for a pendulum
7. Compute that venturimeter has a pipe diameter of 0.2m and a throat diameter 0.15m.The levels of water column in the two limbs differ by 0.1 m. Find the amount of water discharged through the pipe in one hour.(Density of water is 1000kgm-3)
8. Differentiate between C.G. and C.M. and interpret centre of gravity of a solid hemisphere.

Section B

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

9. Describe Bifilar Pendulum – parallel threads with sketch diagram.
10. Explain the centre of pressure of a rectangular lamina. Compute the thrust on the rectangular end of a tank of width 1m and depth 0.6m filled completely with water.Find the position where it acts.
11. Examine the pitot tube. Solve that a pitot tube is fixed in a main of a diameter 0.15m and the difference of pressure indicated by the gauge is 0.04m of water column.Find the volume of the water passing through the main in a minute.
12. Deduce the derivation of Lagrange's equation of motion.
13. Determine the Hamilton's equations and evaluate the physical significance of the Hamiltonian function.

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