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.
M.Sc. (App.Maths) - END SEMESTER EXAMINATIONS APRIL - 2023
SEMESTER - III
20PAMCT3009 - Classical Mechanics

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

Section B

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

1. State and prove konig's theorem.
2. A particle of mass 'm' is suspended by a mass less wire of length r = a + b coswt (a>b>0) to form a spherical pendulum. Find the equation of motion.
3. Explain Eulers theorem on the motion of a rigid body.
4. Find the stationary value of the function $f = z$ subject to the constraints $\varphi_1 = x^2 + y^2 + z^2$ - 4 = 0 and $\varphi_2 = xy - 1 = 0$.
5. Explain Poisson Brackets.
6. State and prove Principle of virtual work.
7. Show that the transformation Q = $\frac{1}{2}(q^2+p^2)$. P = - $\tan^{-1}(\frac{p}{q})$ is canonical. Also find the generating function of the transformation.
8. Explain the Eigen values of the inertia tensor.

Section C

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

9. Derive the Lagrangian equation for holonomic system.
10. Derive the Coriolis force.
11. Derive the canonical equation of Hamilton.
12. State and Prove Principle of Least Action.

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

13. Consider the transformation Q = log($\frac{sinp}{q}$), P = q cotp. Find the four major types of generating function

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