M.Sc DEGREE EXAMINATION,APRIL 2019
II Year III Semester
Classical Mechanics

Time : 3 Hours **Max.marks :75**

Section A $(10 \times 2 = 20)$ Marks

Answer any **TEN** questions

1. Define Holonomic Constraints.
2. Define Virtual work.
3. Define stationary value of a function.
4. State Hamilton principle.
5. Define Eulerian angles.
6. Define reflection of the coordinates axis.
7. Define Legendre transformation.
8. Define angular momentum.
9. Define Poisson brackets.
10. State principle of least action.
11. Define canonical transformation.
12. Define moment of inertia.

Section B $(5 \times 5 = 25)$ Marks

Answer any **FIVE** questions

13. State and prove Principle of Virtual work.
14. State and prove Brachistochrone problem.
15. Explain Eulers theorem on the motion of a rigid body.
16. Explain the Eigen values of the inertia tensor.
17. Explain Poisson brackets.
18. Derive the Hamilton Equation of motion.
19. Show that the transformation $Q = \frac{1}{2}(p^2 + q^2).P = -tan^{-1}(\frac{p}{q})$. Is canonical. Also find the generating function of the transformation.

Section C $(3 \times 10 = 30)$ Marks

Answer any **THREE** questions

20. State and prove D'Alembert's principle.
21. Derive the Legrangian equation for Holonomic system
22. Derive the Coriolis Force.
23. Derive the canonical equation of Hamilton.
24. State and Prove Principle of Least Action.

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