QP Code: RM20MSC101 Reg. No | | | | | | | | | | | AR 20

GIET UNIVERSITY, GUNUPUR – 765022

M. Sc (First Semester) Examinations, May – 2021

20PHPC102– CLASSICAL MECHANICS

(Physics)

Time: 2 hrs Maximum: 50 Marks

(The figures in the right hand margin indicate marks.)

PART – A **(2 x 10 = 20 Marks)**

Q.1. Answer ***ALL*** questions

a. Give an account of angular momentum of a rigid body.
b. What are normal coordinates?
c. State D-Alembert's principle.
d. State calculus of variation.
e. Define holonomic and non-holonomic constraints.
f. Write an any two point of the Poisson's bracket properties.
g. Write the condition for canonical transformation.
h. Mention Hamilton Jacobi equation for Hamilton's principle function.
i. Mention the vibration modes of triatomic molecules in matrix form.
j. State two coupled oscillator with example.

PART – B **(6 x 5 = 30 Marks)**

Answer ***ANY FIVE*** questions Marks

2. Obtain the expression for kinetic energy of rotation in terms of the Euler-angles (6)
3. Derive the Lagrange's equation from Hamilton's principle (6)
4. Derive the Hamilton-Jacobi Equation for Hamilton's Principal Function (6)
5. Explain the working of two coupled oscillators with a proper example (6)
6. Compare Newtonian, Lagrangian and Hamiltonian formulation and discuss the advantages and disadvantages of each. (6)
7. Describe orthogonal transformation. Show that finite rotation of a rigid body about a fixed point of the body is not commutative. (6)
8. Explain in detail about Liouville's theorem (6)

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