

22U153S

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Name:

Reg.No:

FIRST SEMESTER B.Sc. DEGREE EXAMINATION, NOVEMBER 2022

(CBCSS - UG)

CC19U PHY1 B01 - METHODOLOGY OF SCIENCE AND BASIC MECHANICS

(Physics - Core Course)

(2019 Admission - Supplementary/Improvement)

Time : 2.00 Hours

Maximum : 60 Marks

Credit : 2

Part A (Short answer questions)

Answer *all* questions. Each question carries 2 marks.

1. What is a hypothesis?
2. What are constraints? Give Examples.
3. What is gravitational field ?
4. What do you mean by contact forces . Write two examples.
5. Define normal force and friction.
6. Explain time dependent and time independent forces.
7. Define work. Give its unit.
8. Find the work done by a central force
9. What are energy diagrams?
10. Define angular momentum. Give its SI unit.
11. What is the relation between torque and angular acceleration?
12. What is a rigid body?

(Ceiling: 20 Marks)

Part B (Short essay questions - Paragraph)

Answer *all* questions. Each question carries 5 marks.

13. What is meant by 'scientific method'? Write down the different steps involved in a scientific method.
14. Derive an expression for acceleration of astronauts in a tug of war.
15. Find the centre of mass of a nonuniform rod.
16. Is spring force conservative or not? Explain.
17. Derive the law of conservation of energy for the systems where non-conservative forces come into play.

18. Derive an expression for the moment of inertia of a sphere about a diameter.
19. Illustrate the law of conservation of angular momentum by suitable examples.

(Ceiling: 30 Marks)

Part C (Essay questions)

Answer any *one* question. The question carries 10 marks.

20. Describe simple harmonic motion. Form its equation of motion and solve it.
21. Describe the motion of particle in a central force field. Obtain the expression for law of equal areas.

(1 × 10 = 10 Marks)
