

D1BPH1901 (S3)

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Name:

FIRST SEMESTER B.Sc. DEGREE EXAMINATION, NOVEMBER 2022**(Supplementary – 2019 Admission)****PHYSICS****GPHY1B01T: METHODOLOGY OF SCIENCE AND BASIC MECHANICS****Time: 2 Hours****Maximum Marks: 60****SECTION A: Answer the following questions. Each carries 2 marks.
(Ceiling 20 Marks)**

1. Give the necessary conditions of a good hypothesis.
2. What is meant by corroboration?
3. What are the criteria for acceptability of a theory?
4. What is a conical pendulum? Write the expression for its time period.
5. Define electrostatic force and field.
6. State and explain the law of conservation of linear momentum.
7. Define a conservative force. Give one example.
8. What are the conditions for stable equilibrium?
9. Draw energy diagram for the interaction between two atoms.
10. State and explain parallel axis theorem.
11. Obtain the relation connecting angular momentum and torque. What is its significance if torque is zero?
12. What is elastic Hysteresis?

**SECTION B: Answer the following questions. Each carries 5 marks.
(Ceiling 30 Marks)**

13. Explain the various aspects of scientific method.
14. A force 500 N is required to push a car of mass 1000 kg slowly at a constant speed on a level ground. If a force of 1000 N is applied, what is the acceleration of the car?
15. Find the gravitational force due to a solid sphere at points: i) outside the sphere ii) on the surface of the sphere and iii) inside the sphere.

(PTO)

16. Obtain the centre of mass of a right triangular sheet of mass M , base b , height h and small thickness t .
17. State and explain work energy theorem. Determine the expression for escape velocity of earth using work energy theorem
18. Explain the oscillatory behaviour of a particle in a field, when its energy is less than the binding energy.
19. A bob of mass of 500 g is tied to a string of length 60cm and the other end is fixed. The pendulum rotates in such a manner that the bob traces a circular path of radius 20cm, twice in one sec. Find the angular momentum about the center of the circle and about the fixed point.

SECTION C: Answer any 1 question. Each carries 10 marks.

20. Obtain an expression for the period of oscillation of a physical pendulum and extend this to determine acceleration due to gravity 'g' using Kater's pendulum
21. Derive an expression for the depression at the center of a uniform beam supported between two knife edges and loaded at the center.

(1 × 10 = 10 Marks)