

23U114

(Pages: 2)

Name:

Reg.No:

FIRST SEMESTER B.Sc. DEGREE EXAMINATION, NOVEMBER 2023

(CBCSS - UG)

(Regular/Supplementary/Improvement)

CC20U PHY1 B01 - MECHANICS - I

(Physics - Core Course)

(2020 Admission onwards)

Time : 2.00 Hours

Maximum : 60 Marks

Credit : 2

Part A (Short answer questions)

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

1. Give any one limitation of Newton's laws.
2. Write an expression for acceleration of the pulley if two masses m_1 and m_2 are connected by an inextensible string which passes over pulley.
3. What are black holes?
4. What do you mean by contact forces? Write two examples.
5. What is the meaning by 'fictitious force'?
6. Define work. Give its unit.
7. Find the work done by a central force
8. What is power? Write its expression with unit.
9. Draw a figure to show the direction of angular momentum.
10. Why all the planets in the solar system is in a plane?
11. What is a rigid body?
12. Explain the law of conservation of angular momentum.

(Ceiling: 20 Marks)

Part B (Short essay questions - Paragraph)

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

13. Discuss the fundamental units of Length, Time and Mass.
14. Explain the viscous force. Obtain the equation of motion, when a body is moving through a viscous medium.

15. When a ball is shot from a spring gun at angle Q with a velocity V , find the recoil velocity of the gun.
16. Show that curl of a conservative force vanishes.
17. A pendulum bob has a speed 3m/s while passing through its lowest position. What is its speed when it makes an angle of 60 degrees with the vertical? The length of the pendulum is 0.5m . Take $g=10\text{m/s}^2$
18. Derive an expression for the moment of inertia of a sphere about a diameter.
19. Obtain an expression for period of simple pendulum.

(Ceiling: 30 Marks)

Part C (Essay questions)

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

20. State and explain the Newtons laws with examples. What are the limitations of Newtons laws?
21. (a) State work energy theorem.
(b) Find the equation of motion of simple harmonic motion using work energy theorem.

(1 × 10 = 10 Marks)
