U7511

Reg. No.: ……..……..……..

Name:……..…….…...

University of Kerala

First Semester Degree Examination, November 2024

Four Year Under Graduate Programme

Discipline Specific Core Course

PHYSICS

UK1DSCPHY101- Principles of Dynamics

Academic Level: 100-199

Time: 1½ hours Max.Marks: 42

Part A.
Answer All Questions, Objective Type. 1 Mark Each.
(Cognitive Level: Remember/Understand) 6 Marks. Time: 6Minutes

Qn. No.	Question	Cognitive Level	Course Outcome (CO)
1.	Define divergence of two vectors	Remember	1
2.	Define Centre of Mass.	Remember	3
3.	Describe the conservation of linear momentum	Understand	3
4.	If the work done is zero, discuss the angle between force and displacement	Understand	4
5.	Explain work-energy theorem	Understand	4
6.	State an example for the action-reaction pair	Understand	2

Part B.
Answer All Questions, Short Answer. 2 Marks Each.
(Cognitive Level: Understand/Apply) 8 Marks. Time: 24 Minutes

Qn. No.	Question	Cognitive Level	Course Outcome (CO)
7.	Define coefficient of static friction	Understand	2
8.	List and explain the parameters that remain constant during an elastic collision.	Understand	3
9.	Restate the impulse-momentum theorem with an example of impulse	Understand	2
10.	Discuss the differences between tangential and radial acceleration	Understand	4

Part C.
Answer all 4 questions, choosing among options within each question.
Long Answer. 7 Marks Each.
(Cognitive Level: Apply/Analyse/Evaluate/Create) 28 Marks. Time: 60 Minutes

Qn. No.	Question	Cognitive Level	Course Outcome (CO)
11.	A. (i) Discuss the motion of a projectile launched at an angle with respect to the horizontal. (ii) Explain how the position, velocity, and acceleration vectors change throughout the motion. (iii) Use equations to illustrate the horizontal and vertical components of the motion, and describe how gravity affects the projectile. **OR** B. (i) Discuss Newton's Second Law of motion, explaining the relationship between force, mass, and acceleration. (ii) Describe applications in everyday life.	Understand	2
12.	A. Discuss the differences between elastic and inelastic collisions, highlighting conservation of momentum and energy. Provide examples. **OR** B. Describe and compare elastic and inelastic collisions, focusing on momentum and energy conservation, and provide practical applications.	Understand	3
13.	A. Explain the concepts of torque and its relationship with angular momentum by examining how torque influences the rotational motion of objects. **OR** B. (i) Explain the concept of work-energy theorem, highlighting its significance in physics. (ii) Describe how it relates to kinetic energy and potential energy	Understand	4
14.	A. Explain Newton’s second law for particles in uniform circular motion. **OR** B. (i) Explain the gyroscopic effect, focusing on the vector aspects of angular momentum. (ii) Demonstrate how the conservation of angular momentum causes gyroscopes and spinning objects to resist changes in their orientation	Understand	4