Reg. No.: ……..

W7764

Name: ……...

University of Kerala
First Semester FYUGP Degree Examination, December 2025
Discipline Specific Core Course
PHYSICS
UK1DSCPHY101 PRINCIPLES OF DYNAMICS
Academic Level: 100-199
2024 Admission

Time: 1 Hour 30 Minutes **Max. Marks: 42**

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

Qn. No.	Question	Cognitive Level	Course Outcome (CO)
1.	Define scalar multiplication of vectors	Remember	1
2.	Write the equation connecting impulse and force.	Remember	3
3.	Explain conservative and non conservative forces.	Understand	4
4.	Describe the quantity which remains constant for a particle in uniform circular motion	Understand	4
5.	Explain the law of conservation of linear momentum.	Understand	3
6.	Discuss the position-time graph of a body at rest	Understand	2

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

Qn. No.	Question	Cognitive Level	Course Outcome (CO)
7.	Explain the role of Newton’s third law of motion in everyday life	Understand	2
8.	Distinguish between elastic and inelastic collisions.	Understand	3
9.	Define centripetal acceleration. How is it related to tangential velocity?	Understand	4
10.	Explain why a figure skater's rotation speed increases when they bring their arms closer to their body?	Understand	4

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

Qn. No.	Question	Cognitive Level	Course Outcome (CO)
11.	A. (i) Discuss Newton's Second Law of motion, explaining the relationship between force, mass, and acceleration. (ii) Describe its applications in everyday life. OR B. Describe the key factors that affect the motion of a projectile and explain how they are related to the equations for time of flight, range, and maximum height.	Understand	2
12.	A. (i) Explain how the concept of impulse applies in various sports. (ii) Discuss the different ways by which athletes maximize or minimize impulse during performance (iii) Explain Impulse-momentum theorem. OR B. Starting with the definitions of momentum and kinetic energy, discuss how kinetic energy of a particle can be expressed as a function of its momentum	Understand	3
13.	A. (i) Discuss the concept of work done by a constant and a varying force. (ii) Describe how the work–kinetic energy theorem is applied in both cases OR B. Discuss in detail uniform and non-uniform circular motion. Give two examples of each	Understand	4
14.	A. (i) Explain the law of conservation of angular momentum and its role in understanding rotational motion. (ii) Describe how this principle applies to various real-world systems, providing examples OR B. Describe how torque affects angular momentum, and discuss the implications of this relationship for the conservation of angular momentum	Understand	4