

Reg. No.:

Name:



W7538

University of Kerala
First Semester FYUGP Degree Examination, December 2025
Discipline Specific Core Course
PHYSICS
UK1DSCPHY100 Foundation Course in Physics 1
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.	State Gauss' divergence theorem	Remember	1
2.	Define inertia.	Remember	2
3.	Write down the equation of power in terms of force and velocity	Understand	3
4.	State one key difference between an inertial and a non-inertial frame of reference	Understand	2
5.	Describe what happens to the angular momentum of a system if no external torque is applied.	Understand	3
6.	Discuss the concept of torque.	Understand	4

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.	If the curl of a vector is zero, predict the nature of the vector.	Understand	1
8.	Describe how the distribution of mass in a rigid body affects the kinetic energy while in rotational motion	Understand	4
9.	Summarize impulse momentum theorem.	Apply	2
10.	Explain work-energy theorem using an example.	Apply	3

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) Demonstrate how Newton's second law of motion can apply to rockets? ii) Calculate the acceleration of a block of mass 2 kg experienced with a force of 20 N in the positive x-direction, and a force of 30 N in the negative x-direction OR B. A 15 ton truck travels 200m in 50s at constant speed. Estimate the speed of the truck. What force should be applied to stop the truck in 50m.	Apply	5
12.	A. State the three Newton's laws of motion and apply them to show how the concept of force is defined and derived OR B. A book is at rest on a table, in equilibrium. What forces act on the book? What is the reaction force to each of the forces acting on the book?	Apply	2
13.	A. Apply a real world example and hence prove work-energy theorem OR B. An object of mass 1.5kg is freely falling from a height of 10 m. Calculate potential energy, kinetic energy and total energy at i) the surface and ii) at a height of 4m and hence prove law of conservation of energy.	Apply	3
14.	A. Determine the expressions for work and power in rotational motion OR B. Calculate moment of inertia of a circular disc about an axis passing through the edge of the disc and parallel to its principal axis. Given, diameter of disc is 0.4 m, thickness = 7cm and density of material of disc = 9000 kgm^{-3}	Apply	4