

Reg. No.:



Name:

University of Kerala

W7483

First Semester FYUGP Degree Examination, December 2025

Discipline Specific Core Course

PHYSICS

UK1DSCPHY103 - Introduction to Mechanics and Energy resources

Academic Level: 100-199

2025-Admission

Time: 1 Hour 30 Minutes(90 Mins.)

Max. Marks: 42

**Part A. 6 Marks.Time:6 Minutes.(Cognitive Level:Remember(RE)/Understand(UN)) Objective Type. 1 Mark
Each.Answer all questions**

Qn No.	Question	CL	CO
1	Recall Kepler's second law of planetary motion.	RE	2
2	Define derived units with two examples.	RE	1
3	Illustrate the principle of Superposition in relation to gravitation.	UN	2
4	Outline the merits of solar energy	UN	3
5	Explain the parallel axis theorem.	UN	4
6	Compare scalars and vectors with suitable examples	UN	1

Part B.8 Marks.Time:24 Minutes.(Cognitive Level:Understand(UN)/Apply(AP))Short Answer. 2 marks each.Answer all questions

Qn No.	Question	CL	CO
7	Illustrate why rotational kinetic energy depends on the distribution of mass.	UN	4
8	Explain the working of geostationary satellites.	UN	2
9	A vector of 20 Newton is 60° north of east. Identify its components along east and north directions.	AP	1
10	Identify the difference between renewable and non-renewable energy	AP	3

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

Qn No.	Question	CL	CO
11	A)	AP	2, 2

Qn No.	Question	CL	CO
	Apply Newton's law of gravitation to derive an expression for the acceleration due to gravity, g at the surface of the Earth. Show how changes in Earth's mass or radius would affect the value of g OR B) Illustrate the ideas of escape velocity and orbital velocity. Explain the idea why escape velocity is independent of mass of the escaping object.		
12	A) Compare the environmental advantages of biomass energy with its disadvantages, such as deforestation and air pollution OR B) Analyse how nuclear energy is changed into electrical energy in a nuclear reactor. Explain each step from fission to heat, from heat to steam, and from steam to turbine rotation	AN	3, 3
13	A) Evaluate the statement: 'Newton's Second Law for Rotation is the rotational analogue of $F = ma$. OR B) Assess rotational variables and the idea of rotation with constant angular acceleration.	EV	4, 4
14	A) 1.Design a method to determine the unit vector along a direction in space if you are given two points.. 2. Illustrate your method by finding the unit vector from points A(2,-1,3) to B(5,4,-2). OR B) Construct the idea of significant figures by elaborating the rules to find number of significant figures in a value and the rules to find significant figures in calculations.	CR	1, 1