U7517

Reg. No.: .....

Name:.....

U7517

University of Kerala

First Semester Degree Examination, November 2024

Four Year Under Graduate Programme

Discipline Specific Core Course

PHYSICS

UK1DSCPHY103- INTRODUCTION TO MECHANICS AND ENERGY RESOURCES

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 Torque.	Remember	4
2.	Outline the primary energy sources.	Remember	3
3.	Differentiate conventional and non-conventional energy resources.	Understand	3
4.	Summarize the number significant figures in each measurement (a) 0.006606 s (b) 36.7 m	Understand	1
5.	Explain the dot and cross product of two vectors A and B.	Understand	1
6.	Restate Newton's law of gravitation	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.	Describe the relation connecting linear velocity and angular velocity	Understand	4
8.	Distinguish between Nuclear fission and nuclear fusion in terms of energy production.	Understand	3
9.	Determine the magnitude of the given vector 5i-4j+2k	Apply	1
10.	Explain why moon has no atmosphere	Understand	2

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. Explain Solar Constant. Describe the merits and demerits of using solar energy as an energy resource **OR** B. Explain the components of a nuclear reactor with a labelled diagram.	Understand	3
12.	A. Summarize that Kepler's second law is equivalent to law of conservation of angular momentum **OR** B. Interpret using Kepler's second law to convince yourself that the Earth must move faster in its orbit during December, when it is closest to the Sun, than during June, when it is farthest from the Sun.	Understand	2
13.	A. Illustrate the procedure for adding two vectors geometrically. Then demonstrate the properties of vector addition geometrically **OR** B. Explain scalar and vector product of two vectors. Calculate the angle between a = 3i - 4j and b = -2i + 3k.and show that A=2i -3j - k and B = -6i + 9j +3k are parallel	Apply	1
14.	A. Contrast the kinematic equations for linear with rotational motion arriving at the relation connecting Torque, Moment of Inertia and Angular Acceleration **OR** B. (a) State parallel axis theorem. (b) A rod of uniform cross section is rotated about (i) an axis along its central axis and (ii) an axis perpendicular to the central axis. Differentiate the moment of inertia in both cases.	Understand	4