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22PHU205N

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

BSc DEGREE EXAMINATION DECEMBER 2025
(Second Semester)

Branch- **PHYSICS**

MECHANICS AND FLUID DYNAMICS

Time: Three Hours Maximum: 75 Marks

SECTION-A (10 Marks)

Answer **ALL** questions

ALL questions carry **EQUAL** marks (10 × 1 = 10)

Module No.	Question No.	Question	K Level	CO
1	1	What is the principle of conservation of energy is -- a) Energy can be created but not destroyed b) Energy can be destroyed but not created c) Energy can neither be created nor destroyed, only transformed d) Energy always decreases in every process	K1	CO1
	2	Relate the below for Torque ------ a) Force × distance from the axis of rotation b) Force ÷ distance c) Mass × acceleration d) Work ÷ time	K2	CO1
2	3	What is the value of acceleration due to gravity on the Earth's surface is ------- a) 8.9 m/s^2 b) 9.8 m/s^2 c) 10.8 m/s^2 d) 11.2 m/s^2	K1	CO2
	4	Show that the Moment of inertia depends on ----- a) Mass only b) Axis of rotation and distribution of mass c) Volume only d) Density only	K1	CO2
3	5	In the triangle law of forces, the third side of the triangle represents what ? ------ a) The difference of two forces b) The resultant of two forces c) The component of forces d) The torque of forces	K1	CO3
	6	What is the SI unit of coefficient of friction ----- a) N b) N·m c) Dimensionless (no unit) d) J	K1	CO3
4	7	Which instrument works on the principle of fluid pressure (fluid thrust)? a) Barometer b) Thermometer c) Hygrometer d) Galvanometer	K1	CO4
	8	When we were at very high altitudes, the atmospheric pressure approaches ------ a) Infinity b) Zero c) Constant value d) Same as sea-level pressure	K1	CO4
5	9	Choose the correct option: The number of generalized coordinates required to describe a system is equal to ------ a) Number of particles b) Number of degrees of freedom of the system c) Number of constraints d) Number of forces acting	K1	CO5

Cont...

5	10	The tension T in the string of an Atwood's machine is related by --- a) $T=m_1g$ b) $T=m_2g$ c) $T=2m_1m_2/m_1+m_2\,g$ d) $T=(m_1+m_2)g$	K2	CO5

SECTION - B (35 Marks)

Answer **ALL** questions

ALL questions carry **EQUAL** Marks (5 × 7 = 35)

Module No.	Question No.	Question	K Level	CO
1	11.a.	Outline the concepts of work power and energy.	K2, K4	CO1
		(OR)		
	11.b.	Examine the centre of mass of frame of reference.		
2	12.a.	Determine the value of 'g' by compound pendulum.	K5, K3	CO2
		(OR)		
	12.b.	Construct Kater's Pendulum with a neat diagram.		
3	13.a.	Evaluate Parallelogram law of forces.	K5, K6	C3
		(OR)		
	13.b.	Propose Lami's theorem.		
4	14.a.	Explain in brief on thrust on a plane surface.	K2	CO4
		(OR)		
	14.b.	Outline the variation of atmospheric pressure with height.		
5	15.a.	Interpret the equation of continuity of flow.	K5, K6	CO5
		(OR)		
	15.b.	Discuss Sliding bead and Atwood's machine.		

SECTION -C (30 Marks)

Answer **ANY THREE** questions

ALL questions carry **EQUAL** Marks (3 × 10 = 30)

Module No.	Question No.	Question	K Level	CO
1	16	Explain law of conservation of momentum, conservation of angular momentum.	K5	CO1
2	17	Discuss about the experimental determination of moment of inertia of a fly wheel moment of inertia of a thin circular ring , thin circular disc.	K6	CO2
3	18	Determine the composition and resolution of forces – centre of gravity of i) a solid tetrahedron ii) thin hollow cone iii) thin hollow hemisphere.	K5	CO3
4	19	Evaluate the position of centre of pressure in the case of rectangular lamina, triangular lamina, and circular lamina.	K5	CO4
5	20	Formulate Bernoulli's theorem.	K6	CO5

Z-Z-Z END