

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)
BSc DEGREE EXAMINATION MAY 2026
(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	SI unit of work is (i) Joule (ii) watt (iii) Pascal (iv) Newton	K1	CO1
	2	Rocket motion is based on (i) energy conservation (ii) torque (iii) momentum conservation (iv) pressure	K2	CO1
2	3	Flywheel stores (i) Potential Energy (ii) Kinetic Energy (iii) heat (iv) pressure	K1	CO2
	4	Rolling acceleration depends on (i) pressure (ii) mass (iii) density (iv) inertia	K2	CO2
3	5	Lami's theorem applies to (i) 2 forces (ii) 3 forces (iii) many forces (iv) 1 force	K1	CO3
	6	On incline, friction acts (i) upward (ii) downward (iii) normal (iv) parallel	K2	CO3
4	7	Metacentre relates to (i) stability (ii) motion (iii) energy (iv) density	K1	CO4
	8	Thrust equals (i) pressure / area (ii) force / area (iii) pressure x area (iv) force x area	K2	CO4
5	9	Venturimeter measures (i) density (ii) velocity (iii) pressure (iv) discharge	K1	CO5
	10	Atwood's machine shows (i) acceleration (ii) pressure (iii) rotation (iv) density	K2	CO5

Cont...

SECTION - B (35 Marks)Answer **ALL** questions**ALL** questions carry **EQUAL** Marks (5 × 7 = 35)

ALL questions carry EQUAL Marks (5 × 7 = 35)				
Module No.	Question No.	Question	K Level	CO
1	11.a.	Explain conservation of linear momentum with suitable example.	K2	CO1
	(OR)			
	11.b.	Explain centre of mass frame and its significance in collisions.		
2	12.a.	Derive time period of compound pendulum.	K3	CO2
	(OR)			
	12.b.	Derive expression for acceleration of rolling body on inclined plane.		
3	13.a.	Analyze motion of a body on a rough inclined plane under different conditions.	K4	CO3
	(OR)			
	13.b.	Analyze effect of friction using laws of friction for equilibrium conditions.		
4	14.a.	Analyze stability of floating bodies using metacentric height.	K4	CO4
	(OR)			
	14.b.	Analyze position of centre of pressure for different lamina shapes.		
5	15.a.	Apply Bernoulli's theorem to derive Torricelli's theorem.	K3	CO5
	(OR)			
	15.b.	Apply Lagrange's equation to 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	Analyze conservation of linear and angular momentum with real-life applications.	K4	CO1
2	17	Derive expression for moment of inertia of flywheel and discuss experimental errors.	K4	CO2
3	18	Determine centre of gravity of a solid cone and hemisphere.	K3	CO3
4	19	Analyze variation of atmospheric pressure with altitude and discuss assumptions.	K4	CO4
5	20	Derive continuity equation and analyze working of Venturimeter.	K3	CO5