22PHU205N/22PHU205

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

BSc DEGREE EXAMINATION MAY 2024
(Second Semester)

Branch - **PHYSICS**

MECHANICS & 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	When e < 1, the kinetic energy in the collision is ____? a). Gained b) Lost c) Gained exponentially d) Unchanged	K1	C01
	2	The kinetic energy of particles is fully conserved in_____ collision. a). Perfectly inelastic b). Perfectly elastic c). Both d). None	K2	C01
2	3	The moment of inertia of a thin circular disc of mass M and radius R about any diameter is a). 2MR b). $2MR^2$ c). $2/5MR^2$ d). $5MR^2$	K1	CO2
	4	If we increase the length of simple pendulum its time period will _____. a). Increase b). Decrease c). Zero d). Infinity	K2	C02
3	5	Cycle pedaling is an example of a). Moment b). Couple c). Unequal force d). Equal force	K1	C03
	6	What is the formula to find co-efficient of friction? a). μ=F×W b). μ=F/W c). μ=W/F d). μ=R/W	K2	C03
4	7	The pressure at any given point of a non-moving fluid is a). Atmospheric Pressure b). Hydrostatic Pressure c). Differential Pressure d). Gauge Pressure	K1	C04
	8	The principle of floatation of bodies is based on the premise of a). Metacentre b).Above metacentre c). Below the metacentre d). Stability	K2	C04
5	9	If the Reynolds number is greater than 2000 in fluids, it is known as a). Pressure b). Turbulent c). Momentum d). Laminar	K2	C05
	10	The degree of freedom for a free particle in space are a).One b). Two c). Three d). Zero	K1	C05

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.	Write a note on law of conservation of energy and momentum with suitable examples.	K2	CO1
		(OR)		
	11.b.	Show that for a central force, the angular momentum is conserved.	K1	CO1

Cont...

2	12.a.	Differentiate between compound and Kater's pendulum in analysing centre of gravity 'g'.	K1	CO2
		(OR)		
	12.b.	Determine the moment of inertia of a solid sphere.	K2	CO2
3	13.a.	Verify the Lami's theorem of triangle of forces.	K1	CO3
		(OR)		
	13.b.	Elucidate the centre of gravity of solid hemisphere.	K2	CO3
4	14.a.	What is the centre of pressure? Derive centre of pressure for inclined position of the plane.	K2	CO4
		(OR)		
	14.b.	Differentiate between laminar and turbulent flow.	K2	CO4
5	15.a.	Derive the expression for Bernoullis equation.	K1	CO5
		(OR)		
	15.b.	What are Generalized coordinates and Lagrangian coordinates?	K1	CO5

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 the principle of rocket and the advantages in different stages.	K1	C01
2	17	Deduce acceleration due to gravity using vertical oscillation of spring.	K2	C02
3	18	Derive the equations of centre of gravity for hollow hemisphere and solid hemisphere.	K1	C03
4	19	Determine the metacentric height of a ship with a neat sketch.	K2	C04
5	20	Obtain the rate of flow of water using Venturimeter.	K1	CO5

Z-Z-Z END