SHRI RAMSWAROOP MEMORIAL UNIVERSITY

End Semester Examination (2021-22)-Odd Semester

B.Sc. (Hons.) PCM - I Year (I Sem)						
Code: BPH1002						
Max Marks: 60						

University Roll No.															
(To be filled by the Student)												ent)			

Note: Please read instructions carefully:

- a) The question paper has 03 sections and it is compulsory to attempt all sections.
- b) All questions of Section A are compulsory; questions in Section B and C contain choice.

	ion A: Very Short Answer type Questions mpt all the questions.	BL	CLO	Marks (10)
1.	Distinguish between inertial and non-inertial frames. Is earth an inertial frame?	BL2	CLO1	02
2.	What are the factors on which the moment of inertia of a body rotating about an axis depends?	BL1	CLO2	02
3.	Describe central forces? Give two examples of such forces.	BL2	CLO4	02
4.	The value of quality factor is high for small damping. Explain this statement.	BL2	CLO5	02
5.	Differentiate between progressive and stationary waves.	BL2	CLO3	02
	ion B: Short Answer Type Questions mpt any 03 out of 06 questions.	BL	CLO	Marks (30)
1.	Calculate the moment of inertia of a solid sphere about a diameter.	BL4	CLO2	10
2.	Find the expression for the orbital speed and time period of a satellite.	BL4	CLO3	10
3.	A 5000 kg rocket is set for vertical firing. If the exhaust speed is 500 m/s, how much gas must be ejected per second to supply the thrust needed (i) to overcome the weight of the rocket, (ii) to give the rocket an initial upward acceleration of 19.6 m/sec ² .	BL3	CLO1	10
4.	A moving particle of mass m collides elastically head on with a particle of mass 2m which is initially at rest. Show that the particle m will lose 8/9 th part of its initial kinetic energy after the collision.	BL3	CLO1	10
5.	Define coefficient of viscosity? Two drops of water of the same size are falling through air with terminal velocity 1m/s. If the two drops combine to form a single drop, calculate the terminal velocity.	BL4	CLO3	10
6.	Derive an expression for kinetic and potential energy of a body executing simple harmonic motion. Show that the total energy of the body does not depend upon displacement.	BL4	CLO4	10

	tion C: Long Answer Type Questions empt any 01 out of 04 questions.	BL	CLO	Marks (20)
1.	Discuss damped harmonic oscillator. Obtain the differential equation of damped harmonic vibrator and derive its general solution.	BL4	CLO4	20
2.	Differentiate between angle of twist and angle of shear. Deduce an expression for the couple per unit twist required to twist a uniform solid cylinder of length I and radius r.	BL4	CLO2	20
3.	What do you understand by reduced mass? How is the two-body problem reduced to a single-body problem?	BL4	CLO3	20
4.	Find expression for the acceleration of the centre of the mass a body rolling down an inclined plane without slipping. A sphere of mass 2.5 kg and diameter 1 m rolls without slipping with a constant velocity of 2 m/s. Calculate its total kinetic energy.	BL3	CLO1	20
