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OR

5.	(p)	State and prove law of conservation of angular momentum.	4
	(q)	Derive an expression for M.I. of circular disc about an axis passing through its center	er
		and perpendicular to its plane.	5
	(r)	Calculate M.I. of a disc of mass 1 kg and radius 10cm about an axis passing throug	ţh
		its center and perpendicular to its plane.	3
2	EIT	HER	
6.	(a)	What is compound pendulum? Obtain an expression for the periodic time of compour	Id
		pendulum.	6
	(b)	Define linear S.H.M. and obtain differential equation of S.H.M.	4
	(c)	A mass of 50 gm is attached to a spring having spring constant 0.2. Determine tin	10
	op	period of oscillation.	2
-	OR	Define the encyles CILM show that the subsection of her magnet in uniform magnet	:
1.	(p)	field is another S.H.M. show that the vibration of bar magnet in uniform magnet	6
	(a)	Field is angular S.H.M.	0 of
	(\mathbf{q})	solve the differential equation of damped narmonic motion and show that velocity	
	(\mathbf{r})	What are hifiler oscillations 2	7
	(I) FIT		2
8	(2)	Find the resultant displacement for the superposition of two mutually perpendicul	ar
0.	(a)	S H M's of same neriod	6
	(b)	What is piezoelectric effect ? Explain the production of ultrasonic waves of piezoelectr	ic
	(0)	oscillation	6
	OR	oscillation.	
9.	(p)	Describe construction and working of Kundt's tube.	4
	(q)	Derive Newton's formula for velocity of sound in medium.	5
	(\mathbf{r})	State applications of Ultrasonic wave.	3
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10.	(a)	Find the expression for twisting couple per unit twist for cylindrical wire.	6
	(b)	Explain how modulus of rigidity of wire can be determined by Maxwell Needle.	6
	OR		
11.	(p)	What are torsional oscillations ? Derive an expression for the periodic time of torsion	al
		pendulum.	6
	(q)	Derive an expression for depression at the loaded end of light beam clamped horizontal	ly
		at the other end.	6
	EII	HER	
12.	(a)	State and prove Bernoulli's theorem.	6
	(b)	State and prove Stoke's law.	4
	(c)	What is the significance of Reynold's number ?	2
	OR		12
13.	(p)	Explain Jaeger's method to determine surface tension of a liquid.	6
	(q)	Explain :	
		(i) Streamline flow	55
		(ii) Turbulent flow.	4
	(r)	What is surface tension ? Give its unit and dimensions.	2

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B.Sc. (Part-I) Semester-I Examination

6					1S :	PHYSICS					
				(Mechanics, P	roperties of	Matter W	aves and Oscil	lation)			
Tim	e : 1	hree	Hou	urs]				[Maximum N	Aarks : 80		
Note : (1)		-(1)	All	questions are	compulsory.				100000000000000000000000000000000000000		
		(2)	Dra	w neat diagram	ns wherever	necessary					
1.	(a)	Fill	in th	he blanks :							
		(i)	The	The acceleration due to gravity at the poles is							
		(ii)	The	fundamental	frequency is	also called	as .				
		(iii)	Coe	Coefficient of viscosity with increase in temperature.							
		(iv)	You	Young's modulus of elasticity is related with change in 2							
	(b)) Choose correct answer :									
	10500-555	(i)	The	angle of cont	act of water	with glass	is .				
			(a)	90°		(b)	0°				
			(c)	Less than 90°	D	(d)	Greater than 9	0°			
		(ii)	Kep	oler's second la	w of planeta	ry motion	is about	e 142 - 142	19		
			(a)	Elliptical orb	it	(b)	Period				
			(c)	Areal velocit	У	(d)	Volume				
		(iii)	The	e moment of li	near moment	um is	•	9. E			
			(a)	Couple		(b)	Torque				
			(c)	Impulse		(d)	Angular mome	entum			
		(iv)	In c	compound pend	dulum, centre	of suspen	sion and centre	of oscillation	are		
			(a)	Interchangeat	ole	(b)	Not Interchang	geable			
			(c)	At equal dist	ance from C.	G. (d)	None of the al	bove	2		
	(c)	Ans	wer	in one sentend	ce:						
		(i)	Wh	at is cantilever	r ?						
	2	(ii)	Def	fine streamline	flow.						
		(iii)	Def	ine cohesive f	orce.						
		(iv)	Dei	ine moment of	f inertia.				4		
	EIT	HE	2								
2.	(a)	Def	ine a	acceleration du	e to gravity.	Explain va	riation of 'g' wi	ith :			
		(i)	Hei	ght		(11)	Depth		6		
	(b)	Stat	e an	d prove Gauss	's Theorem.				4		
	(c)	Def	ine :				o				
	0.0	(1)	Gra	witational field	1	(11)	Gravitational p	ootential	- 2		
2	OR	D		· · · ·				1.1.11.4			
5.	(p) Derive an expression for gravitational potential due to spherical she							I shell at a po	int outside		
	(a)	the	snei	l. d. naorra Vanla		of ulouoto			0		
	(q)	Stat	e an	a prove Keple	rs inird law	of planeta	ry motion.		0		
4		Ctot	•	d prova thaora	m of manufallel	aver for	moment of Incr	tio	5		
4.	(a) (b)) State and prove theorem of paramet axes, for moment of inertia.							c one of		
	(0)	its ands. Calculate moment of inertia about this axis							agn one of		
	(c) If a disc has mass 5kg and radius 0.5m calculate M1 of a d							a disc about	a tangent		
	(0)	nerr	endi	cular to ite pl	ane radius	0.5m, ca	iourate Will. Of	a unse about	a tangent		
		beit	unu	icular to its pla	anc.				5		

3.

4.



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	(-)	period of oscillation.
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7.	(p)	Define the angular S.H.M. show that the vibration of bar magnet in uniform magnetic
		field is angular S.H.M.
	(q)	Solve the differential equation of damped harmonic motion and show that velocity o
		particle decreases exponentially.
	(r)	What are bifilar oscillations ?
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