QUARTERLY EXAMINATION - 2024

C	lass : 11			PHYSIC	cs	Re	g.No		
Tir	me : 3.00 Hours			,		-		Marl	ks : 70
1	,	, .	P	ART – I				1	15 × 1 = 15
ote:	(ii) Choose		stions propriate ans iding answer	swer from	the given fo	ur alterná	tives a	nd write ti	ne option
. Ii	f the length and time neasurement of accel	period of an	oscillating pe	ndulum ha	ve errors of	1% and 3%	respec	tively then	the error in
• a) 4%	. b) !	5%	c)	6%			7%	
A	uniform force of (2i	$+\hat{j})N$ acts	on a particle of	mass 1 kg.	The particle	displaces fr	om po	sition $(3j-$	⊦k) m to
0	$5\hat{i} + 3\hat{j}$) m. The work	done by the	force on the pa	article is					
a	- 1	b) (5 J	c)	10 J		d)	12 J	
,	he velocity of a parti	icle depends	upon the time	t according	g to the equa	ation $v = a$	+ bt	+ c Wri	te the
	imension of d		•				*		
a	[LT-1] .		[LT ⁻²]		[T]		d)	[L]	
	which one of the follow		l quantities car Length	nnot be repr	esented by a Momentun	scalar?	d)	Magnitude	of acceleration
a)	wo discs of same me			,			-,	•	
to	the plane of disc wi	ith angular v	elocities ω ₁ an	d ω ₂ . They	are brought	in to conta	ct face	to face co	inciding the
ax	cis of rotation. The e	expression fo	r loss of energ	gy during th	is process is	3,			
a)	$\frac{1}{4}I(\omega_1-\omega_2)^2$	'b)	$I(\alpha_1 - \alpha_2)^2$	c)	$\frac{1}{-I(\omega_1-\omega_2)}$	$(2)^2$	d)	$\frac{1}{-}I(\omega_1-\omega_2)$	$\left(\frac{1}{2} \right)^2$
	$4^{1(\omega_1-\omega_2)}$		(\omega_1 \omega_2)		8-101 0	2)		2	
N	hich of the following	ig is the grap	h between the	height (h)	of a projecti	ile and time	e (t), w	hen it is pr	ojected from
th	e ground?	•	. f		bÎ .			hÎ	
	h		h l						photo to
a)		b)		c)			d), .		
	0 t		0 1		O	→ · · · · ·	•	0	1
T	wo masses m_1 and n_2	n ₂ are exper	iencing the sa	me force w	here $m_1 < n$	n2. The rati	o of th	eir acceler	ation $\frac{a_1}{a_2}$ is
a)	1 ound of the following	number 19	less than 1	onificant fig	nires .	iaii I	٠,	an are an	ee cases
a)	-		20.0	c)	20.1		d)	19.5	
A	body is under the act			dicular forc	es of 3N and	14N. The re	sultan	force actin	g on the body
a)	7 N		1 N	c)	5 N		d)	Zero	
A	body of mass 1 kg	is thrown u	pwards with a	velocity 2	0 m s ⁻¹ . It n	nomentarily	y come	es to rest a	iter attaining
a)	eight of 18 m. How i		7 is lost due to 30 J	c)	40 J		d)	10 J	
,	the velocity is $\vec{v} = \vec{v}$	* *		- /		at $t = 0.5 s$	is		
a)		b) 2		c)	zero		d)	-1 m s ⁻²	
In	an elastic collision	2010							
a)				red b) d)	only mom	entum is com and kinet	ic ene	ed rov are not	conserved
c)									
T	he ratio of the accel	eration for a down the inc	l sond sphere Line without r	olling is.	id radius K)	roning do	wii an	dictine of	angre o marc
· a)			2:3	c)	2:5		d)	7:5	
A	n object of mass m	begins to mo	ve on the plan	e inclined	at an angle (9. The coef	ficient	of static fr	iction of
	clined surface is μ_s .								
· a)	•		$\mu_s mg$	c)	$\mu_s mg \sin \theta$		d) -	$\mu_s mg \cos$	θ .
	he unit mass having	$\vec{r} = 8\hat{\imath} - 4\hat{\jmath}$	and $\vec{v} = 8\hat{\imath} +$	4ĵ in its ang	gular mome	ntum is			v 1
a)			+64k	c)	+64]		d)	-64ĵ	
.1	•							1	1-Physics-Pag

Answer any six questions. Question no. 24 is compulsory:

- Briefly explain the types of physical quantities. 16.
- 17. Differentiate velocity and speed.
- Two vectors \vec{A} and \vec{B} are given in the component form as $\vec{A} = 5\hat{\imath} + 7\hat{\jmath} 4\hat{k}$ and $\vec{B} = 6\hat{\imath} + 3\hat{\jmath} + 2\hat{k}$. Find $\vec{A} + \vec{B} \cdot \vec{B} \vec{A}$ 18.
- 19. Define one newton.
- 20. Consider a circular road of radius 20 meter banked at an angle of 15 degree. With what speed a car has to move on the turn so that it will have safe turn?
- 21. Define power and mention its unit.
- Write various types of potential energy. 22.
- Give any two examples of torque in day-to-day life. 23.
- Find the moment of inertia of a ring of mass 9 kg and radius 3 m rotating with 240 rpm about an axis passing 24. through its centre and perpendicular to its plane.

 $6 \times 3 = 18$

Answer any six questions. Question no. 33 is compulsory:

- Explain the rules for Rounding Off?
- Using free body diagram, show that it is easy to pull an object than to push it. 26.
- In a submarine equipped with sonar, the time delay between the generation of a pulse and its echo after reflection 27. from an enemy submarine is observed to be 80 s. If the speed of sound in water is 1460 ms⁻¹. What is the distance of enemy submarine?
- Give any three properties of vector product of two vectors. 28.
- Write the differences between conservative and non-conservative forces. 29.
- 30. Find the radius of gyration of a disc of mass M and radius R rotating about an axis passing through the centre of mass and perpendicular to the plane of the disc.
- Derive the relation between momentum and kinetic energy? 31.
- State and prove parallel axis theorem. 32.
- If two objects of masses 2.5 kg and 100 kg experience the same force 5 N, what is the acceleration experienced 33. by each of them?

PART - IV

 $5 \times 5 = 25$

Answer all the questions:

Explain the applications of dimensional analysis.

- State and explain work energy principle. Mention any three examples for it. b)
- Derive the equations of motion for a particle falling vertically 35. a)

- Discuss rolling on inclined plane and arrive at the expression for the acceleration. b)
- Prove the law of conservation of linear momentum. Use it to find the recoil velocity of a gun when a bullet 36. a) is fired from it.

- (i) Give the general rule for error in the power of a quantity. b)
 - (ii) A physical quantity x is given by $\frac{a^2b^3}{c\sqrt{d}}$. If the percentage errors of measurement in a, b, c and d are 4%, 2%, 3% and 1% respectively, then calculate the percentage error in the calculation of x.
- 37. Arrive at an expression for velocity in one dimensional elastic collision.

- Derive the equation of motion, time of flight and horizontal range reached by the particle thrown at the b) horizontal direction.
- Explain the types of equilibrium with suitable examples.

 (Or) 9715075736 38. a)
 - Explain the need for banking of tracks. b)

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	ne : 3.00 Hours			PHYSI	CS		Marks : 70
TO AN	Alexandria	T. A		PART - I			15 × 1 = 15
Note:	(i) Answer al (ii) Choose th	e most	uestions appropriate a ponding answe	nswer from	the given four al	ternatives	and write the option
. If	the length and time pe	eriod of	f an oscillating		ve errors of 1% ar	nd 3% resp	ectively then the error in
m a)	easurement of acceler	ation d b)	ue to gravity is 5%	c)	6%	en1	
. A	uniform force of $(2\hat{i} +$	nN a	cts on a particle	of mass 1 kg.	The particle displa	aces from p	osition $(3j+k)$ m to
207	$(\hat{i}+3\hat{j})$ m. The work d					1913-1914	
- 7			6 J	ST.	10.1	· d)	12 J
a)	9 J he velocity of a particl	e dene	nde upon the tim	o t accordin	a to the equation 1		
		e deper	ids upon the till	ie t accordin	g to the equation		d+t
	mension of d [LT ⁻¹]	b)	[LT-2]	. 0	[T]	(b)	[L]
	hich one of the followi	ng phys	sical quantities ca	annot be repr	esented by a scalar	?	
a)	Mass	b)	Length	es	Momentum	d)	Magnitude of acceleration
to	the plane of disc with is of rotation. The exp	angula ression	r velocities ω ₁ a for loss of ener	and ω ₂ . They rgy during th	are brought in to	contact fac	enter and perpendicular ce to face coinciding the
pr	$\frac{1}{4}I(\omega_1-\omega_2)^2$	b)	$I(\omega_1-\omega_2)^2$	· c)	$\frac{1}{8}I(\dot{\omega}_1-\omega_2)^2$	d)	$\frac{1}{2}I(\omega_1-\omega_2)^2$
W	hich of the following i	is the g	raph between th	ne height (h)	of a projectile and	l time (t), v	when it is projected from
	e ground?						
	. h	4	h		h		•
(a., PG	RANASANAS	(d P)		M		(d)	
- ilea	E 10 11 12 14 2 2		0 1	MA SAIR		4	1
Ty	vo masses my and ma	are exp	periencing the sa	ame force w	here $m_1 < m_2$. Th	e ratio of t	heir acceleration $\frac{a_1}{a_2}$ is
	617 LATT (mstaphamete	and)	less than I	10	greater than I	d)	all the three cases
	und of the following nu 19.9	imber i	20.0	c)	20.1	d)	19.5
At	ody is under the action						nt force acting on the body
a)	7 N	b)	1 N	sn.	5 N	d)	Zero
. At	oody of mass 1 kg is	thrown	upwards with	a velocity 2	0 m s ⁻¹ . It momer	tarily con	es to rest after attaining
hei	ght of 18 m. How muc 20 J	b)	The second second	air inction	40 J	: d)	10 J
· If the	ne velocity is $\vec{v} = 2\hat{l} +$			enitude of a			
A)	1 m s^{-2}	b).	2 m s ⁻²	c)	zero	d)	-1 m s ⁻²
In a	n elastic collision momentum and kine	etic en	ergy are conser	ved b)	only momentum	is conserv	ved
A	only kinetic energy			. d)	momentum and	kinetic en	ergy are not conserved
. The		ion for	a solid sphere	(mass m an	d radius R) rollin	g down ar	incline of angle θ without
	5:7	20.0	2:3	c)	2:5	d)	7:5
. An	object of mass m begi	ns to n	nove on the plan	ne inclined a	t an angle 0. The	coefficien	t of static friction of
	ined surface is μ_s . The		THE RESERVE OF THE PROPERTY OF				
a)	mg.	b)	$\mu_s mg$	c)	$\mu_s mg \sin \theta$	an	$\mu_s mg \cos \theta$
				The ball of the second		100000000000000000000000000000000000000	THE RESERVE TO THE PARTY OF THE
The state of	unit mass having $\vec{r} =$	$8\hat{i} - 4$	\hat{j} and $\vec{v} = 8\hat{i} +$	4î in its and	ular momentum i	S	
The State of the S	unit mass having $\vec{r} = -64\hat{k}$	8î - 4	\hat{j} and $\vec{v} = 8\hat{i} + 64\hat{k}$	4ĵ in its ang	ular momentum i +64ĵ	s d)	-64ĵ

	Ansv	wer a	PART – II any six questions. Question no. 24 is compulsory: efly explain the types of physical quantities.	L. PRAKASAM M.Sc., B.Ed., PGDC. P. F.G. Asst in Physics. Kalaimagai Maric Rr. Sec. School. Kalkuricht, Beiukuricht[P.O.) 637 102. Sendamangalam (Tk.) Namakati (Dt.)						
	17.	Diff	ferentiate velocity and speed.							
.4	<u>>18.</u>	Two	e vectors \vec{A} and \vec{B} are given in the component form as $\vec{A} = 5\hat{\imath} + 7\hat{\jmath} - 4\vec{k}$	and $\vec{B} = 6\hat{\imath} + 3\hat{\jmath} + 2\hat{k}$. Find $\vec{A} + \vec{B}, \vec{B} - \vec{A}$						
25	19. 20.	9. Define one newton.								
	21.		ine power and mention its unit.							
	22.		te various types of potential energy.							
20	23. 24.	Find	e any two examples of torque in day-to-day life. If the moment of inertia of a ring of mass 9 kg and radius 3 m rotating ough its centre and perpendicular to its plane. PART – III	with 240 rpm about an axis passing $6 \times 3 = 18$						
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	26	Usir	ng free body diagram, show that it is easy to pull an object than to pus	h it.						
l·1	27.	In a submarine equipped with sonar, the time delay between the generation of a pulse and its echo after reflection from an enemy submarine is observed to be 80 s. If the speed of sound in water is 1460 ms ⁻¹ . What is the distance of enemy submarine?								
	28.		e any three properties of vector product of two vectors.	MON DESIGNATION OF THE PARTY OF						
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	32.	State and prove parallel axis theorem.								
	33.	If tw	vo objects of masses 2.5 kg and 100 kg experience the same force 5 N	, what is the acceleration experienced						
1.2	7	by e	ach of them?							
-			PART – IV	$5 \times 5 = 25$						
	Answ	ver a	Il the questions:							
	34.	a)	Explain the applications of dimensional analysis. (Or)	PRAKASAM M.Sc.,B.Ed.,PGDCA						
	35.	b) a)	State and explain work energy principle. Mention any three examp Derive the equations of motion for a particle falling vertically	Kalaimagal Matric Hr. Sec. School, Kalkurichi, Belukurichi(P.O.)-637402. Sendamangalam (Tk.) Namakkai (Dt.)						
			(Or) Discuss rolling on inclined plane and arrive at the expression for the							
		b)	Discuss forming on inclined plane and arrive, at the expression for the	le acceleration.						
	36.	a) ·	Prove the law of conservation of linear momentum. Use it to find t is fired from it.	he recoil velocity of a gun when a bullet						
		b)	(Or) (i) Give the general rule for error in the power of a quantity.							
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	1.9	(ii) A physical quantity x is given by $\frac{d}{c\sqrt{d}}$. If the percentage errors of measurement in a, b, c and d are 4%, 2%, 3% and 1% respectively, then calculate the percentage error in the calculation of x.								
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			(Or)	ISIOIL.						
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	38.	a)	Explain the types of equilibrium with suitable examples.							
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				11-Physics-Page-2						