SUVA SANGAM COLLEGE

<u>YEAR 13</u>

PHYSICS

WORKSHEET 6

Strand 1 P13.1	Mechanics
Sub-Strand P13.1.5	Rotational Dynamics
Content Learning Outcome P13.1.5.1	Apply the concept of both linear and rotational dynamics to solve problems.
Reference from Text	Pg 24 to 27

Questions

No.	CONCEPT IN BRI	EF: Relation	on between	linear and angula	r variables:				
	$s = r\theta$	$s = r\theta$ $v = r$		$v = r\omega$		$a = r\alpha$			
1.	Fill in the blanks.								
	a) is the ratio of the length of arc and radius of the circle.								
	b) is used to describe how quickly an object is rotating.								
	c) One revolution is radian.								
	d) State the unit of th	e following	g:						
	Angular displaceme	nt	Angular v	velocity	Angul	Angular acceleration			
2.	A flywheel rotating a	t 500 Hz 18	s brought to	rest in 5 seconds	5.				
	a) Express 500 Hz in	rad/s	- 4						
	b) Calculate the angu	lar accelera	ation						
	CONCEPT IN BRI	FF: Rotatio	onal Dynam	ice					
			Relationships						
	Sym	bols	2		Relation	ıships			
	Sym Variable	bols Linear	Angular		Relation inear	nships Angular	7		
	Symi Variable Speed / Velocity	bols Linear	Angular Wi , We		Relation inear =u + at	nships Angular ω _f = ω _i + αt			
	Syml Variable Speed / Velocity	bols Linear u, v	Angular ω _i , ω _f	L v=	Relation inear =u+at	Angular			
	Sym Variable Speed / Velocity Displacement	bols Linear u, v s	Angular ω _i , ω _f θ	L V= s=u	Relation inear =u+at $t + \frac{1}{2}at^2$	Angular $\omega_{f} = \omega_{i} + \alpha t$ $\theta = \omega_{i}t + \frac{1}{2}\alpha t^{2}$	-		
	Sym Variable Speed / Velocity Displacement Acceleration	Linear u, v s a	Angular ω _i ,ω _f θ α	$\frac{L}{v}$	Relation inear =u+at $t + \frac{1}{2}at^2$ $u^2 + 2as$	Angular $\omega_{f} = \omega_{i} + \alpha t$ $\theta = \omega_{i}t + \frac{1}{2}\alpha t^{2}$ $\omega_{f}^{2} = \omega_{i}^{2} + 2\alpha\theta$	-		
	Sym Variable Speed / Velocity Displacement Acceleration	bols Linear u, v s a	Angular ω _i ,ω _f θ α	$\frac{L}{v}$	Relation inear =u+at $t + \frac{1}{2}at^2$ $u^2 + 2as$	Angular $\omega_{f} = \omega_{i} + \alpha t$ $\theta = \omega_{i}t + \frac{1}{2}\alpha t^{2}$ $\omega_{f}^{2} = \omega_{i}^{2} + 2\alpha\theta$			
3.	Syml Variable Speed / Velocity Displacement Acceleration	bols Linear u, v s a at rest, acce	Angular ω _i ,ω _f θ α elerates unif	$\frac{L}{v}$ $s=u$ $v^{2} =$ Formly at 3 rads-	Relation inear =u+at $t + \frac{1}{2}at^2$ $u^2 + 2as$ -2 for 20 sec	Angular $\omega_{f} = \omega_{i} + \alpha t$ $\theta = \omega_{i}t + \frac{1}{2}\alpha t^{2}$ $\omega_{f}^{2} = \omega_{i}^{2} + 2\alpha\theta$ onds.	-		
3.	Variable Speed / Velocity Displacement Acceleration A flywheel, initially a Determine the follow	bols Linear u, v s a t rest, acco	Angular ω _i , ω _f θ α elerates unif	$\frac{L}{v}$ $s=u$ $v^{2} =$ Formly at 3 rads-	Relation inear =u+at $t + \frac{1}{2}at^2$ $u^2 + 2as$ -2 for 20 sec	Angular $\omega_{f} = \omega_{i} + \alpha t$ $\theta = \omega_{i}t + \frac{1}{2}\alpha t^{2}$ $\omega_{f}^{2} = \omega_{i}^{2} + 2\alpha\theta$ onds.	-		
3.	Symle Variable Speed / Velocity Displacement Acceleration A flywheel, initially a Determine the follow a) The angle it turned	bols Linear u, v s a t rest, acco ing : through d	Angular ω_i, ω_f θ elerates unif	$\frac{L}{v} = \frac{1}{v^2}$	Relation inear =u+at $t + \frac{1}{2}at^2$ $u^2 + 2as$ -2 for 20 sec	Angular $\omega_{f} = \omega_{i} + \alpha t$ $\theta = \omega_{i}t + \frac{1}{2}\alpha t^{2}$ $\omega_{f}^{2} = \omega_{i}^{2} + 2\alpha\theta$ onds.			
3.	Symle Variable Speed / Velocity Displacement Acceleration A flywheel, initially a Determine the follow a) The angle it turned b) The linear acceleration	Linear u, v s a at rest, according : through d tion of a p	Angular ω_i, ω_f θ α elerates unif uring this ti oint 12cm f	$\frac{L}{v^2}$ $s=u$ $v^2 =$ Formly at 3 rads-	Relation inear =u+at $t + \frac{1}{2}at^2$ $u^2 + 2as$ -2 for 20 sec f the wheel	Angular $\omega_{f} = \omega_{i} + \alpha t$ $\theta = \omega_{i}t + \frac{1}{2}\alpha t^{2}$ $\omega_{f}^{2} = \omega_{i}^{2} + 2\alpha\theta$ onds.			
3.	SymlVariableSpeed / VelocityDisplacementAccelerationA flywheel, initially a Determine the followa) The angle it turnedb) The linear accelera c) The final angular v	Linear u, v s a at rest, according : through d tion of a p velocity of	Angular	$\frac{L}{v} = \frac{v^2}{s}$ Formly at 3 rads-me from the centre o	Relation inear =u+at $t + \frac{1}{2}at^2$ $u^2 + 2as$ -2 for 20 sec f the wheel	Angular $\omega_{f} = \omega_{i} + \alpha t$ $\theta = \omega_{i}t + \frac{1}{2}\alpha t^{2}$ $\omega_{f}^{2} = \omega_{i}^{2} + 2\alpha\theta$ onds.			