SCHEME OF VALUATION

(SCORING INDICATORS)

REVISION:-

COURSE CODE:-

COURSE TITLE:-

QUESTION NO.	SCORING INDICATOR	SPLIT UP SCORE	SUB TOTAL	TOTAL
I	Part A			
1.	Temperature – Kelvin (K)	1	2	2
	Luminous Intensity – Candela (cd)	1		
2.	Statement.	2	2	2
3.	definition Stress – Restoring force developed per unit area.	1	2	2
	" Strain – Change in dimension / Original dimension.	1		
4	Statement	2	2	2
5	Definition or figure of node	1	2	2
	" of antinode	1		
	Part B			
II				
1.	Statement of third law	1		
	[illegible]			
	momentum of m_2 before Collision $= m_2u_2$			
	momentum of m_2 after Collision $= m_2v_2$	1		
	Rate of change of momentum $= \frac{m_2v_2 - m_2u_2}{t}$	1		

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	Action $= \frac{m_2v_2 - m_2u_2}{t}$	1		
	Ilg Reaction $= \frac{m_1v_1 - m_1u_1}{t}$			
	From third law Action = − Reaction		6	6
	$\frac{m_2v_2 - m_2u_2}{t} = \frac{m_1v_1 - m_1u_1}{t}$	1		
	$m_1u_1 + m_2u_2 = m_1v_1 + m_2v_2$	1		
2.	Definition of resolution	1		
	definRectangular resolution	1		
	Horizontal component $= F\cos\theta$ $= 30 \times \cos 60 = 15$ N	2	6	6
	Vertical component $= F\sin\theta$ $= 30 \sin 60 = 25.98$ N	2		
3.	Definition of impulse	2		
	Impulse $= F \times t$	1		
	$= ma \times t$	1		
	$= m\frac{(v-u)}{t} \times t$	1	6	6.
	$= mv - mu$ = change in momentum.	1		

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4	Statement	2		
	figure	1	6	6
	Explanation & equation	3.		
5.	Definition of wavelength	1		
	" frequency	1		
	velocity	1	6	6.
	velocity $= \frac{\lambda}{T}$.	1		
	$\frac{1}{T} = f$	1		
	$\therefore V = f\lambda$	1		
6	Statement	2		
	equation.	1		
	figure of Atomiser	1	6	6.
	Explanation using Bernoulli's principle	2		
7	Definition of free vibration.	2		
	" of forced vibration	2		
	Resonance — frequencies are equal	1	6	6
	maximum amplitude	1		

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	$= k\, m \frac{dv}{dt} = kma$	1	4	6
	$F = kma$, In S.I unit $k=1$	1		
	$F = ma$.			
V (a)	statement	2	2	
	fig	1		
	Applying pythagoras theorem		4	6
	$R^2 = OD^2 + CD^2$	1		
	$R = \sqrt{P^2 + 2PQ\cos\theta + Q^2}$	2		
	$\alpha = \tan^{-1}\left(\frac{Q\sin\theta}{P+Q\cos\theta}\right)$			
(b)	Parallel forces - definition	1	3	3
	Condetions	2		
c	$P = 4N$			
	$Q = 5N$			
	$\theta = 60$			
	$R = \sqrt{P^2+Q^2+2PQ\cos\theta}$	1		
		2		
	Substitution	1		
	$R = 7.81\,N$.	1	6	6.
	$\alpha = \tan^{-1}\left(\frac{Q\sin\theta}{P+Q\cos\theta}\right)$			
	$\alpha = \tan^{-1}(0.66) = 33.67°$	1		

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	PART C.			
III				
(a)	Definition of speed, velocity and acceleration	3	3	3.
(b)	$S_n = S_1 - S_2$ — (1)	1		
	$S_1 = un + \frac{1}{2}an^2$	1		
	$S_2 = u(n-1) + \frac{1}{2}a(n-1)^2$	1		
	Substitute in eqn (1)	1		
	$S_n = u + a(n-\frac{1}{2})$	2		
c				
	$S_n = u + a(n-\frac{1}{2})$	1		
	$30 = u + 4.5a$	1		
	$80 = u + 6.5a$.	1		
	on solving $a = 25\ m/s^2$.	1	6	6
	$u = -82.5\ m/s$	1		
	$S_9 = 130\ m$.	1		
	OR.			
IV.				
(a)	Definition of fundamental and derived	1		
	quantity.	1	3	3
	example	1		
b	any four advantage.	4	4	
	unit of velocity	1	2	6
	unit of acceleration	1		
c	Statement of second law	2	2	
	$F \propto \frac{dp}{dt}$	1		
	$F = K\frac{d}{dt}(mv)$	1		

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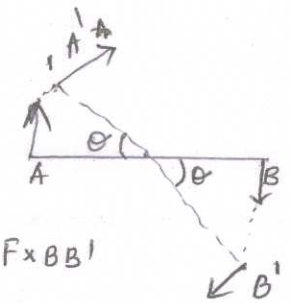
VI				
(a)	definition - Couple.	2	2	
b	Derivation :- of workdone.			
	figure 	1		
	Workdone $W = F \times AA' + F \times BB'$			6.
	$W = F \cdot AB \times \theta$	1	4	
	$W = C\theta$.	1		
		1		
(b)				
	Power $P = 2\pi NC$.	2		
	Substitution.	2	6	6.
	$P = 4396$ W.	2		
(c)				
	Definition - Resultant	1½	3	3.
	Definition - equilebrant	1½		
VII				
(a)	Stokes law $F = 6\pi\eta r V$	1		
	Gravitational pull $(mg) = \frac{4}{3}\pi r^3 \rho g$	1		
	upthrust $= \frac{4}{3}\pi r^3 dg$	1		
	When the sphere aequeres teminal velocity			
	mg = upthrust + Viscous force	1		
	$\frac{4}{3}\pi r^3 \rho g = \frac{4}{3}\pi r^3 dg + 6\pi r\eta V$	1		

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	Simpliging $\eta = \frac{2r^2(\rho-d)g}{9V}$	1	6	6
(b)	kinetic energy Potential energy Pressure energy	3	3	3.
c.	$V = \frac{2}{9} r^2 \frac{(\rho-d)g}{\eta}$	2		
	Substitution	2	6	6.
	Answer $32.08 \times 10^{-4} m/s$.	2		
VIII (a)	Young's modulus Bulk modulus Rigidity modulus	3		
(b)	equation $a_1v_1 = a_2v_2$	2	2	
	$a_1v_1 = a_2v_2$	2		
	$\pi r_1^2 v_1 = \pi r_2^2 v_2$. $v_1 = 2m/s$, $r_1 = 3\times10^{-2}m$, $r_2 = 2\times10^{-2}m$.	2.		
	$v_2 = \frac{v_1 r_1^2}{r_2^2}$, $v_2 = 9$.			

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	~~Sb~~ substitution.	1	4	6
	Answer. = 4.5 m/s.	1		
c	$V = \frac{\pi p r^4}{8 l \eta}$	2		
	Expeerimental setup and diagram	2	6	6.
	Procedure of experiment. $\eta = \frac{\pi h d g r^4}{8 V l}$	2		
Ix (a)	Definition of eqn. $a \propto -x$	2		
	differential equation.			
	$\frac{d^2y}{dt^2} + \omega^2 y = 0$.	1		
b	Definition	2		
	Explanation of any method	4	6	6
c	$\lambda = 2L = 0.92$ m.	1		
	$f = 384$ Hz	1		
	$V = f\lambda$.	2	6	6.
	Substitution			
	Answer 353.3 m/s.	2		

X.				
(a)	Diagram of labelled nodes and antinodes	1		
	Any two characteristics	2		
(b)	figure	2+		
	frequency of first three modes	2+2	6	
(c)	$v = 2f(l_2 - l_1)$	2		
	$l_1 = 0.176$ m $\quad l_2 = 0.532$ m	1		
	$f = 484$ Hz		6	
	Substituting and solving	2		
	Answer $v = 344.6$ m/s	1		