

ASIAN PHYSICS OLYMPIAD - 2012

Sr. No.	EXPERIMENT 1	Marks	Maximum Marks
PART 1			
1	For observations of M_p corresponding to values of M_w for $\theta = \pi$		1.5
	4 readings	0.4	
	5 readings	0.5	
	6 readings	0.6	
	7 readings	0.7	
	8 readings	0.8	
	5 readings with $\Delta M_p < 5$	0.4	
	6 readings with $\Delta M_p < 5$	0.5	
	7 readings with $\Delta M_p < 5$	0.6	
	8 readings with $\Delta M_p < 5$	0.7	
2	For graph of M_p vs M_w		0.4
	Choice of Scale (to cover 70% or more space on graph sheet)	0.1	
	3 points on straight line	0.1	
	4 points on straight line	0.2	
	Both Axis labeled with proper units	0.1	
3	For value of slope $b : 0.6 \leq b \leq 0.8$	0.3	0.3
	For value of slope $b : 0.5 \leq b < 0.6$ or $0.8 < b \leq 0.9$	0.1	
4	For observations of M_p corresponding to values of θ for $M_w = 800.0$ g		2.6
	6 to 7 readings	0.5	
	8 readings	1	
	9 readings	1.1	
	10 readings	1.2	
	11 readings	1.3	
	12 readings	1.4	
	8 readings with $\Delta M_p < 5$	0.8	
	9 readings with $\Delta M_p < 5$	0.9	
	10 readings with $\Delta M_p < 5$	1	
	11 readings with $\Delta M_p < 5$	1.1	
	12 readings with $\Delta M_p < 5$	1.2	
5	For graph of M_p versus θ		1
	Proper Choice of Scale (to cover 70% or more space on graph sheet)	0.2	
	Both Axis labeled with proper units	0.2	
	Smooth Curve	0.6	
	Moderately smooth curve (atleast half the points on the curve)	0.4	

6	For graph of $\ln M_p$ (or $\ln(M_p/M_w)$) vs θ		0.9
	Choice of Scale (to cover 70% or more space on graph sheet)	0.2	
	4 points on straight line	0.4	
	5 points on straight line	0.5	
	6 points on straight line	0.6	
	Both Axis labeled with proper units	0.1	
7	For value of slope, b: $0.09 \leq k \leq 0.13$	0.5	0.5
	For value of slope, b: $0.08 < k < 0.09$ and $0.13 < k < 0.14$	0.4	
8	Valid method for estimation of uncertainty	0.1	0.2
	Uncertainty in $\mu \leq 0.02$ (Expanded uncertainty)	0.1	
9	Identifying coefficient of θ as μ	0.1	0.1
10	Correct Equation: $P = W e^{-\mu\theta}$ or $M_p g = M_w g e^{-\mu\theta}$	0.5	0.5
	Incorrect Equation: $M_p = M_w e^{-\mu\theta}$	0.2	
	Incorrect Equation: $P = CW e^{-\mu\theta}$ or $M_p g = CM_w g e^{-\mu\theta}$	0.2	
PART 2			
11	Correct Equations for determining M_u and μ_u	0.4	1
	Correct method to obtain M_u and μ_u	0.6	
12	Observations: $[M_{p1-}, M_{p1+}]$ and $[M_{p2-}, M_{p2+}]$	0.4	0.4
13	Value of M_u		0.2
	$115 \leq M_u \leq 121$	0.2	
	$113 \leq M_u < 115$ and $121 < M_u \leq 123$	0.1	
14	Uncertainty in $M_u \leq 4$ g (Expanded uncertainty)	0.1	0.1
15	Value of μ		0.2
	$0.13 \leq \mu \leq 0.20$	0.2	
16	Uncertainty in $\mu \leq 0.01$ (Expanded uncertainty)	0.1	0.1
		Total	10