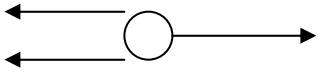
Marking Scheme for Physics Olympiad - M.C.Q. Paper - 2008

(1) 2 (Two)	(11) 4 (Four)
(2) 5 (Five)	(12) 3 (Three)
(3) 3 (Three)	(13) 2 (Two)
(4) 3 (Three)	(14) 5 (Five) Sinhala paper 4 (Four)
(5) 1 (One)	(15) 5 (Five)
(6) 1 (One)	(16) 1 (One)
(7) 4 (Four)	(17) 1 (One)
(8) 1 (One)	(18) 3 (Three)
(9) 4 (Four)	(19) 2 (Two)
(10) 2 (Two)	(20) 5 (Five)

02 marks each 02x20 = 40 marks

ANSWER SHEET FOR PART B

QUESTION NUMBER	ANSWERS	MARKS (examiner's use)
1 (i)	$v_1 = \frac{2}{9}\frac{R^2 g(\rho - 10^3)}{\eta}$	05
(ii) (a)	VISCOUS FORCE  CETRIFUGAL FORCE/STORG GRVITATIONAL FORCE BOYANT/UP THRUST FORCE	06 **(02 MARKS FOREACH FORCE)**
(b)	$v_2 = \frac{2}{9}\frac{R^2 10^5 g(\rho - 10^3)}{\eta}$	10
(c)	v_A **= 0.1 m s^{-1}**	03
	v_B **= 0.2 m s^{-1}**	03
(d)	***B***	03

2. (i)	$\boldsymbol{T}$ = 3 days (24×10^4 s)	03
	ω = 2.5×10^{-5} rad s^{-1}	02
(ii) (a)	$\lambda' = \lambda_0\left(1+\frac{v}{c}\right)$	03
(b)	$\boldsymbol{v_1}$ = $1.02\times10^5(1.0-1.1\times10^5)$ m s^{-1}	02
	$\boldsymbol{v_2}$ = $1.53\times10^5(1.5-1.6\times10^5)$ m s^{-1}	02
(iii)	$\frac{m_1}{m_2}$ = 1.5 (1.4 – 1.6)	04
(iv)	$r_1 = 4.08\times10^9(4.0-4.1\times10^9)$ m	03
	$r_2 = 6.12\times10^9(6.0-6.2\times10^9)$ m	03
(v)	$r = 1.02\times10^{10}(1.0-1.1\times10^{10})$ m	02
(vi)	$m_1 = \frac{r^2v_2^2}{Gr_2}$	03
	$m_2 = \frac{r^2v_1^2}{Gr_1}$	03
