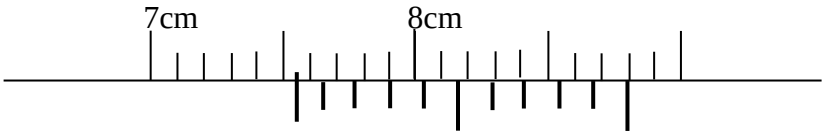
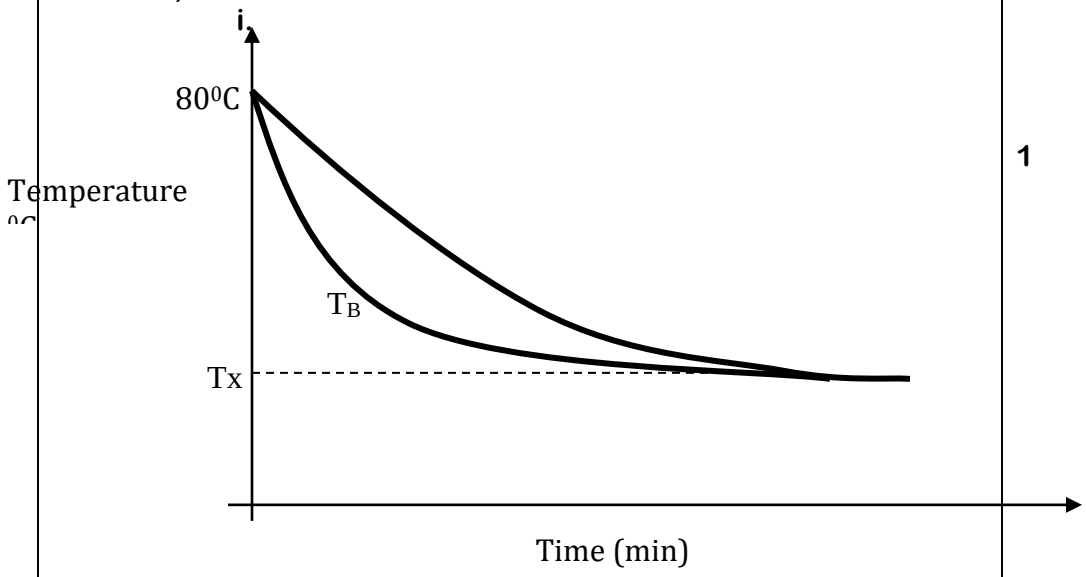
PHYSICS PAPER 232/1
FORM FOUR
MARKING SCHEME

SECTION A (25 marks)			
1.	Reading + error = Actual R = 7.57-0.04 = 7.53cm  	1 1 1	Calculation of R 3rd vernier scale aligning Complete vernier scale inserted correctly
2.	a. B large area of force application implying less pressure is exerted. b. $pressure\ of\ trapped\ air = P_{atm} - (P_{due\ to\ water} + P_{mercury})$ $P_{air} = \left(\frac{75}{100} \times 13600 \times 10\right) - \left(\frac{58}{100} \times 1000 \times 10 + \frac{20}{100} \times 13600 \times 10\right)$ P_{air} = 102,000 –(5800+27200) =102,000 – 33000 =69,000Pa	1 1 1 1 1	
3.	Uniform acceleration	1	
4.	Zero acceleration (constant velocity) (W = F + U) the body has attained a terminal velocity	1 1	
5.	When the temperature increases, the gas molecules gain more kinetic energy and move faster; the rate at which they collide increase.	1 1	
6.	More stable or stability increases when the candle melts the position of COG lowers	1 1	
7.	Diffusion involves movement of matter and it can only happen when in tiny particles.	1	
8.	Due to the resultant downward cohesive force on the molecules on the surface of liquid, the net force on molecule inside the liquid is zero.	1 1	

9.	$RD\ of\ paraffin = \frac{upthrust\ in\ paraffin}{upthrust\ in\ water}$ $\frac{0.3-0.2}{0.3-0.15} = \frac{0.1}{0.15} = 0.67$ $\rho = 0.67 \times 1000 = 670kg/m^3$	**1** **1** **1**	
10.	**A** **When air is blown through A, pressure inside reduces but in B remains the same.** **The higher atmospheric pressure outside in A makes it collapse.** **ALT.** **In A there is pressure difference between inside and outside but in B ther is no pressure difference.**	**1** **1**	
11.	**Conduction involves passing of heat energy from one molecule to the next through vibration.** **Convection involves heated molecules moving up on becoming lighter and are replaced by colder molecules (convectional currents**	**2**	**tied**
SECTION B (55 MARKS)			
12.	**a)** **i. Pointer** **ii. Note and record the initial length of the spring before loading** **Record the new length after loading** **Get the difference** **iii. Weight of the mass/stretching force** **iv.** • **Assuming elastic limit of the spring is not exceeded** • **Note and record the extension of the spring and the corresponding value of the weight of the mass/stretching force.** • **Increase the mass at intervals and note and record several values of extension and weight of masses in a table.** • **Plot a graph of stretching force against extension.** • **Note the nature of the graph (it will be a straight line through the origin.** **b)** **One spring = 2cm** **K=F/e** **F = 150/1000 x 10 = 1.5N**	**1** **1** **1** **1** **1** **1** **1** **1** **1**	

	K= $^{1.5}/_{2}$ **= 0.75N/cm or 75N/m**	**1** **1**	
		11	
13.	**a)** **F x 0.8 = (90 +20)x10 x 0.2** $F = \frac{110\times10\times0.2}{0.8}$ **=275N** **b)** $VR = \frac{effort\ dist}{load\ dist} = \frac{0.8}{0.2}$ **= 4** **c)** $MA = \frac{load}{effort} = \frac{900}{275}$ **= 3.273** **d)** $eff. = \frac{MA}{VR} \times 100$ $eff. = \frac{3.273}{4} \times 100$ **= 81.82%** **e) Some energy is used to lift the weight of the machine (20kg)**	**1** **1** **1** **1** **1** **1** **1** **1** **1** **1** **1**	
		12	
14.	**a)** **i. The bulb of the thermometer is dipped in the boiling water. Should be in the steam.** **ii. Impuriites in water would raise its boiling point hence the mark would be higher.** **iii. To ensure that the steam is at normal/standard atmospheric pressure by allowing excess steam out.** **b)** **100^{0}C ==➔11-3=8cm** **80^{0}C➔ 80/100 x8 = 6.4cm**	**1** **1** **1** **1** **1**	

	Length = 3 + 6.4 = 9.4cm **c)**  **ii. Room temperature** **iii. Radiation** **d) Nature of the material** **Temperature difference between the ends of the conductor** **e)** **Large interparticle distances** **They do not have free electrons.**	**1** **1** **1** **1** **1** **1** **1**	
		12	
15.	**a) Specific latent heat of fusion of ice is the amount of heat required to change unit mass of ice completely to water at constant temperature.** **b)** **i. Heat lost by steam = $mL_v + mc\Delta T$** $\frac{60}{1000} \times 2.26 \times 10^6 + \frac{60}{1000} \times 4200 \times (100 - 40)$ **= 150,720J** **ii. $m_iL_f + m_ic\Delta T + m_wc\Delta T + m_cc_c\Delta T$** **$3.34 \times 10^5 \times m_i + m_i \times 4200 \times 40 + 0.1 \times 4200 \times 40 + 0.05 \times 400 \times 40$**	**1** **1** **1** **1** **1** **1** **1**	

	$3.34 \times 10^5 \times m_i + 168{,}000mi + 16800 + 800$ **$502{,}000mi + 17{,}600$** **iii.** **$502{,}000mi + 17{,}600 = 150{,}720$** $$mi = \frac{150{,}720 - 17{,}600}{502{,},000}$$ **= 0.265kg or 265g**	**1** **1** **1** **1**	
		10	
16.	**a) The direction is continously changing. This implies change in velocity hence acceleration** **b)** $$\omega = 2\pi f = 2 \times 3.142 \times 6 = 37.704 rads\ /s$$ **$a = v^2/r = r\ \omega^2 = 37.704^2 \times 0.6$** **a = 852.955m/s** **c)** **i.** $\frac{50-0}{25-0} = 20N/kg$ **ii.** $\frac{P}{m} = slope$ **P = m x slope = 20 x 0.2 = 4.0N** **iii. P represent Centripetal force**	**1** **1** **1** **1** **2** **1** **1** **1**	
	TOTAL	**55**	
	SECTION B (55 MARKS)		