KCSE 2007 PHYSICS MARKING SCHEME
PAPER 1

1.	0.562 – 0.012 = 0.550cm 5.62 – 0.12 = 0.55 cm 5.5 mm	Or 5.62 – 0.12 5.5	1 mk
2.	Density p= m/r D = m/v = $\frac{1.75g}{(0.550)^3 cm}$ formula substitution = $10.5g/cm^3$ answer $10500kg/m^3$ - accept g/mm^3 - allow transfer of error		3 mks
3.	V_2V_4 V_1 V_3 (correct order)		1 mk
4.	Sucking air reduces pressure inside the tube; so that atmosphere pressure forces the liquid up the tube		1 mk
5.	Look for symbols $P_A gh_A = Pagh_B$ formula or correct $P_Ag \times 24 = 1200\ g \times 16$ substitute substitution $P_a = 800\ kgm^{-3}$ answer answer		3 mks
6.	Radiation		1 mk
7.	X_2 is made greater than X_1 / X_1 is made shon X_2 X_2 is made larger than X_1 Since B receives radiation at a higher rate, it must be moved Further from sources for rates to be equal: since A receives radiation at a lower rate than B. $F_1 d_1 = f_2 d_2$		2 mks
8.	Taking moments and equating clockwise movements = anticlock movements 0.6 N x 7cm = mg N x 30cm; W = mg = 1.4 N:		3 mks
9.	Distance = area under curve between 0 and 3. 0 second; = 120 x 3 x 0.2 = 72M: Trapezium Rule (3 trapeziua) Mid – ordinateral = 70.5		
10.	Acceleration = slope of graph at t = 4.0 s Or a= $\frac{\Delta V}{\Delta t}$ or trapezium rule (6 trapezia) = 72m = $\frac{16 \times 3}{17 \times 0.2}$ = 14.11 m/S^2 (12 – 14.5) m/s^2 or trapezium (1) or 1 triangle = 76.5m		2 mks
11.	Pressure, impurities::		2 mks
12.	Kelvin (K) in words (one triangle used follow)		2 mks
13.	The pressure of a fixed mass of a gas is directly proportional to its absolute (Kelvin) temperature provided the volume is kept constant P & T volume constant		1 mk
14.	Since the quantity of water A is smaller, heat produces grater change of temperature in A; This causes greater expansion causing the cork of temperature in A; this cause greater expansion causing the cork to sink further. Per unit volume/ greater decrease in density/ lower density in A		

	SECTION B	
15 (a)	**Smoke particles** Show the behavior or movement of air molecule Smoke particles are larger than air molecules/ visible and light enough to move when bombarded by air molecules **Lens** Focuses the light from the lamp on the smoke particle; causing them to be observable **Microscope** Enlarge the smoke particle So that they are visible/ magnifies smoke particles	2 mks) 2 mks) 2 mks)
(b)	Smoke particle move randomly / zigzag / haphazardly Air molecules bombard the smoke particles/ knock, hit Air molecules are in random motion	3 mks
(c)	The speed of motion of smoke particles will be observed to be higher smocking particles move faster, speed increases, increased random motion	1 mk
16(a)	A body at rest or motion at uniform velocity tends to stay in that state unless acted on by an unbalanced force/ compelled by some external force to act otherwise.	1 mk
(b) (i)	$S = \underline{\Delta u}$ Nd or $\frac{98.75 - 0\ (m/s)^2}{16 - 0}$ $= 6.17ms^{-2}$	3 mks
ii	$20k = s = 6.09$ depend on (i) $K = \frac{6.09}{20}$ $= 0.304$	2 mks
iii	Increase in roughness increases k and vice versa Uniform speed in a straight line – uniform velocity	1 mk
(c)	Applying equation $V^2 - u^2 = 2as$ $V^2 - 0 = 2 \times 1.2 \times 400$ Momentum $p = mv$ $= 800 \times \sqrt{2 \times 1.2 \times 400}$ $= 24787.07$ $= 24790$	4 mks
17.(a)	Quantity of heat required to change completely into vapour 1 kg of a substance as its normal boiling point without change of temperature; Quantity of heat required to change a unit mass of a substance from liquid to vapour without change in temp	1 mk
(b) (i)	So that it vaporizes readily/ easily	1 mk
(ii)	In the freezing compartment the pressure in the volatile liquid lowered suddenly by increasing the diameter of the tube causing vaporization in the cooling finns, the pressure is increased by the compression pump and heat lost to the outside causing condensation. Acquires heat of the surrounding causing the liquid to vaporize	

(iii)	When the volatile liquid evaporates, it takes away heat of vaporization to form the freezing compartment, reducing the temperature of the latter. This heat is carried away and disputed at the cooling finns where the vapour is compressed to condensation giving up heat of vaporization	
(iv)	Reduces rate of heat transfer to or from outside (insulates) Reduces / minimizes, rate Minimizes conduction/ convertion of heat transfer	1 mk
(c) (i)	Heat lost = $ml_v + mc\ \Delta\theta$ = formula Heat lost by steam = 0.003 x 2.26 x 106 = substitution Heat lost by steam water = 0.003 x 4200 (100-T) Total = 6780 + 126 (100 – T) = 8040 – 12.6T	3 mks
(ii)	Heat gained by water = MC θ = 0.4 x 4200 (T- 10) Or = 1680 T - 16800	1 mk
(iii)	Heat lost = heat gained OR correct substitute 1680 (T – 10) = 6780 12.6 (100-T); Allow transfer of error 1680T – 16800 = 6780 + 1260 – 12.6T 1692 .6 T = 24840 T = 14.7^0C 14.68	1 mk 15 mks
18.(a)	Rate of change of velocity towards the centre Acceleration directed towards the centre of the motion Acceleration towards the centre of orbit/ nature of surface	2 mks
(b) (i)	Roughness / smoothness of surface. Radius of path/ angular velocity/ speed (Any two)	2 mks
(ii)	II) $_A > (l)_B\ (l)_C$ (correct order)	1 mk
(c)	$F = m(l)^2 r$ $F = MV^2$ $V=rw$ For thread to cut r $w = \underline{3.049}$ F= 5.6 N $5.6 = 0.2 \times v^2$ 0.15 (l) = 13.7 radius $V^2 = 4.2$ = 13.66 13.66 v = 2.0494	4 mks
19 (a)	A floating body displaces its own weight of the fluid on which it floats	
(b)(i)	To enable the hydrometer float upright / vertically	1 mk
(ii)	Making the stem thinner/ narrower (reject bulb)	1 mk
(iii)	Float hydrometer on water and on liquid of known density in turn and marks levels; divide proportionally and extend on either side/ equal parts	2 mks
(c)i)	Tension; upthrust; weight	3 mks
(ii)	As water is added, upthrust and tension increase; reaching maximum when cork is covered and staying constant then after weight remains unchanged as water is added	3 mks 11mks