FORM 4
PHYSCIS 1
MARKING SCHEME

1. Pressure at a point in a fluid is transmitted equally to all points of the fluid and to the walls of the container.
2. Atmospheric pressures is higher than normal/standard or boiling was below
   Pressure of impurities
3. When flask is cooled it contracts/its volume reduces but due to poor conductivity of the glass/materials of the flask water falls as it contraction is greater than the of glass (3mks) marks are independent unless there is contradiction
4. $\pi x\ 4^2 x v_1 = \pi x 6^2 x 5$

5. Heated water has lower density hence lower up thrust
6. Glass is a poor conductor of heat
   For the thick glass inner wall gain heat and expands while the outer wall does not. The tension between the two walls breaks the glass
7. Increasing the base area
   the centre of gravity
8. Unstable equilibrium

9

360-180
=180m =60

10. During the down stroke V1 closes down due to its own weight. Pressure is increased in the chamber forcing V2 to open hence water flows past V_2
11. Water contains impurities which raise points
    Only steam is pure enough to give the exact value of the boiling point
12. Diffusion occurs in all directions, molecules move in all directions
    Convetion occurs in one direction-upwards or downwards
13. Heat energy required to raise the temperature of a body by 1 degree Celsius/centigrade of Kelvin

Measurements or
Initial mass of water and calorimeter M_1
Final mass of water and calorimeter M_2
Time taken to evaporate (M_1-M_2),t

Heat given out by heater=heat of evaporation = ML
Pt(m1-m2)1

$L = \frac{pt}{M_1 - M_2}$

(i) $C\Delta T = 40x(34-25) = 40x9 = 360J$
(ii) $M_W C_W \Delta T$

$100x10^{-2}x4.2x10^3(34-25) = 3780J$
(i) MmCmΔT or sum of (i) and (ii)
=150x103xCm6 360+3780
$=9.9C_mJ$ =4140J
(iv) $150x10^{-3}xCmx66 = 4140$ heat lost = heat gained by water+ heat gained

$Cm = \frac{4140}{150x10^{-3}x60}$
418J/kgk

9.9cm=360+3780
$Cm = \frac{4140}{0.15x60}$
418J/Kgk

14. (a) In solids the molecules are held in position by intermolecular forces that are very large. In liquids the molecules are able to roll over one another since the forces are smaller

(a) (i) Volume = $4/3\pi r^3$

$=^4/_3\pi$x 0.253

= 6.54x 10-5cm^3 (2mks)

(ii) Area = πr^2

πx 10^2

=314cm^2 (2mks)

(iii) Ax diameter of molecule=volume

314xd=6.54x10^{-5}

D=2.1x10^{-7}cm (3mks)

(c)(i) The soil is assumed to have spread to thickness of one molecule (1mk)

(ii) Sources of errors

- Getting the right oil
- Measuring drop diameter
- Measuring diameter of patch
- Getting drop of a right size (any 2x1=2mks)

15. Rate of change of velocity towards the centre

Acceleration directed towards the centre of the motion

Acceleration towards the centers orbit/nature of surface (1mk)

16(a) The ratio of the distance moved by the effort to the distance moved by the load;(1mk)

(b) (i) V.R=5

(ii) Efficiency =x100%

=83.33%

17. (a) 2000x5+5000x (-7)=v(2000+5000) √1

V=

=-3.571m/s √1 (3D.P a must)

(b) Ft=m(v-u) √ or F=

=171,450N√

(c)(i) Initial K.E = ½ x 2000x 5^2 + ½ x 5000x $(-7)^2$

=147,500J√1

Final = ½ x 7000$(-3.571)^2$

=44,632J√1

Change= 44632-147,500

=-102,868J√1

Kinetic energy is converted to heat sound and deformation

18. (a) (i) A floating body displaces its own weight of fluid in which floats√1

(ii) The weight of the solid sphere is more than the weight of the volume of water it displaces hence it sinks √ 1while the weight of the hollow sphere is equal to the weight of the volume of water it displaces hence it floats √1

(b)(i) Weight = vol x density x g

$=6x10^{-4}x2x10^{-2}x10$√1

(ii) Weight =V xℓxg

$6x10^{-4}x2x10^{-2}x10$√1

$=1.2x10^{-1}$N√1

(iii) Weight of block=weight of fluid displaced

$=1.2x10^{-1}+9.6x10^{-2}$√

$=2.16x10^{-1}$N

$=2.16x10^{-2}$

Density = mass/Vol

$=600kg/m^3$