KAPSABET HIGH SCHOOL

232/1 (*Kenya Certificate of Secondary Education*) **Paper 1**

INTERNAL MOCK EXAM

PHYSICS

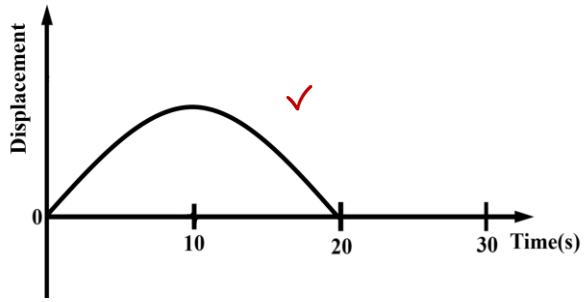
(THEORY)

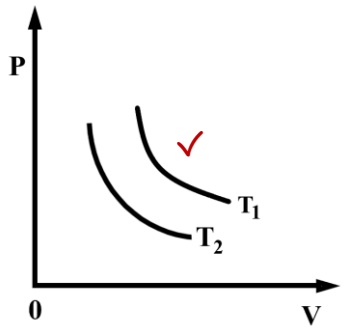
Dec. 2020– 2 Hours

MARKING SCHEME

Instructions to candidates

a) *Write your Name, Index, Admission number and stream in the spaces provided above.*
b) *Sign and write the examination date on the spaces provided above.*
c) *This paper consists of Two sections;* ***A*** *and* ***B***
d) *Answer all the questions in sections A and B in the spaces provided*
e) *All workings* ***must*** *be clearly shown.*
f) *Non-programmable silent electronic calculators may be used.*
g) *All your answers must be written in the spaces provided in the question paper.*
h) Candidates should check the question paper to ascertain that all the pages are printed as indicated and that no questions are missing.
i) Candidates must answer the questions in English.

1. Volume = 12-3 = 9cm3. ✓
   Density = $\frac{\text{mass}}{\text{volume}}$ or $\rho = \frac{m}{V}$ ✓
   or
   $\rho = \frac{18.0}{9}$
   $= 2.0 gcm^{-3}$ ✓
2. The volume decreases ✓. The pressure exerted on the balloon due atmospheric air increase ✓.
3. F = 100N ✓.
4. The pollen grains move faster / more vigorously ✓. The kinetic energy/velocity of the water molecules increase transferring more kinetic energy to the pollen grains ✓.
5. Brass expands more than invar ✓. The bimetallic strip curls more moving the pointer in the clockwise ✓.
6. The bench, the stand and the hand all have the same temperature ✓. No conduction of heat ✓.
7. Volume of oil drop = volume of oil patch
   $= \pi r^2 t$ ✓
   $6.0 = \pi(\frac{350}{2})^2 t$
   $t = 6.234 \times 10^{-5} mm$ or $6.234 \times 10^{-8} m$ ✓
8. (Sum of)clockwise moments = (Sum of)anticlockwise moments/ $F_1 d_1 = F_2 d_2$ ✓
   or
   40x0.5 = Wx0.5 + 10x1.5
   W = 10N ✓
9. B has more weight/mass at the top than A ✓ hence the position of its centre of gravity is higher ✓ .
10. The diameter of pipeline decreases.] Any one ✓
    The pipeline has a sharp bend.
11. 

12. The milk in the bottle covered with wet is cooled by evaporation while the milk in the bottle in cold water is by rise in temperature of cold the water ✓. Evaporation requires more heat than that needed to raise the temperature of water ✓
13. 

14. Wire of spring A is thicker than that of spring B.
    Diameter of spring A is smaller than that of spring B. } Any two ✓✓
    Spring A has fewer turns (per unit length) than spring B

15. a) (i) The sphere accelerates ✓with reducing acceleration✓ until it attains terminal velocity or acceleration becomes zero.

(I) $60ms^{-1}$✓

(II) It remains constant until the sphere reaches the bottom✓

(ii) Distance = 'area under the graph'✓

= (35+ ½x10) squares x 100✓

= 4000m✓

b) (i) A – Viscous drag✓ B – weight✓.

(ii) Weight = Upthrust + Viscous drag/ B = U + A✓

16. a) (i) Velocity ratio = $\frac{\text{Effort distance}}{\text{Load distance}}$ ✓ = $\frac{2\pi R}{2\pi r}$ ✓ = $\frac{R}{r}$

(ii) I. V.R = $\frac{R}{r} = \frac{40}{8}$ ✓= 5✓

II. $\eta = \frac{M.A}{V.R}$x100% = $\frac{W/_E}{V.R}$x100%✓

90% = $\frac{W/_{100}}{5}$x100%

W = 450N✓

b) (i) Total momentum before collision = total momentum after collision

$\frac{100}{1000}$ x 250 = (19.9 +0.1)v✓

v = $1.25ms^{-1}$✓

(ii) ΔK.E = ½($0.1x250^2 - 20x1.25^2$) ✓

= 3109.375J✓

(iii) ½mv^2= mgh

½$x20x1.25^2$ = 20x10h✓

h = 0.078125m✓

17. a) (i) m_2 ✓. it requires a larger centripetal force than m_1✓.

(ii) Friction(between the masses and the turntable✓).

b) (i) Weight✓ and tension✓.

(ii) $\omega = \frac{s}{rt}$ ✓= $\frac{0.12}{0.2x0.5}$✓

= $1.2rads^{-1}$✓

(iii) $F = mr\omega^2$ = ✓0.3x 0.2 x 1.2^2= 0.0864N✓

18. a) (i) Similarity - both involve the change of state from liquid to gaseous/both require heat energy✓

Difference – evaporation occurs only on the surface of the liquid while boiling occurs throughout the liquid/ Evaporation at all temperature boiling occurs at a specific temperature. ✓

(ii) P. ✓In P heat is used raise water to a higher temperature while in Q some heat is used to melt ice hence the temperature rise is lower✓

b) $Q = mc_i\Delta\theta_i + mL_f + mc_w\Delta\theta_w + Cc\Delta\theta + mL_v$✓

= 0.5 x 2100x20 + 0.5 $x3.36x10^5$ + 0.5x4200x100 + 300x120+ $2.26x\ 10^6$✓

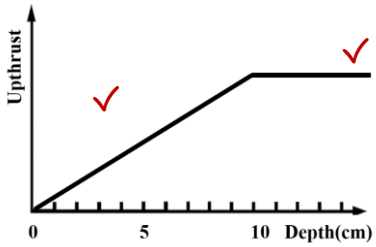
= $1.565X10^6$J✓

c) (i) Energy required when the gas expands is obtained from the gas molecule thus cooling the gas.

(ii) $\frac{P_1V_1}{T_1} = \frac{P_2V_2}{T_2}$ ✓$= \frac{4.0\ x10^5 x0.5}{300} = \frac{P_2 x10}{290}$✓

$P_2 = 1.933x10^4Pa$ ✓

19. a)



b) In water, the weight of the object is greater than the upthrust while in liquid L, the weight is equal to the upthrust.

c) (i) $U = mg + T = V\rho_w g$✓

$= 10x10 + 50 = 1000x10V$✓

$V = 0.015m^3$✓

(ii) $\rho = \frac{m}{V}$ ✓$= \frac{10}{0.015} = 666.67kgm^{-3}$✓

d) The air is compressed✓ and more enters the test tube✓. The average density of the test tube and its contents becomes greater than the density of water✓