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PHYSICS
PAPER 1
July/August 2008

MOLO DISTRICT MOCK EXAMINATION
Kenya Certificate of Secondary Education 2008

MARKING SCHEME

PHYSICS
Paper 1
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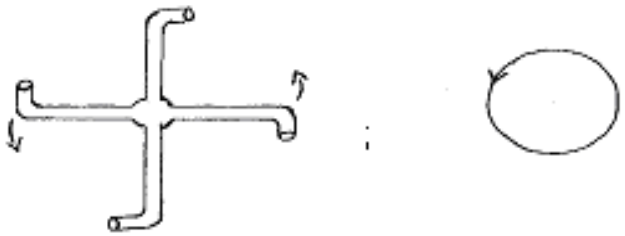
SECTION A

1. 2.6V – 0.6V = 2.4V; (1mk)

2. Energy can neither be created nor destroyed; (1mk)

3.



Reject Anticlockwise; (1mk)

4.

20

clockwise movement = anticlockwise movement.
20 x F = 6 x 15
$F = \frac{6x15}{20}$;
F = 4.50 N; (3mks)

5. On heating
- Kinetic energy increases in molecules hence speed of vibration;
- The distance between the molecule increases;
- Cohesional /intermolecular forces reduces;
They occupy more space. (3mks)

6. Nature of road surface
- Nature of wheels surface Any one; (1mk)

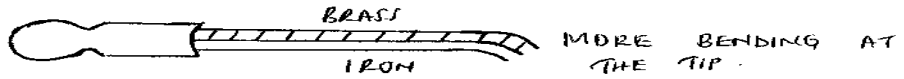
7. $W = Mg_e$;
$M = \frac{w}{g_e} = \frac{1960}{10} = 196Kg.$

$1470N = 196 \times g_{p;}$
$g_p = \frac{1470}{196}$
$g_p = 7.5N/Kg;$
(3mks)

8. Metals have free / delocalized electrons; which are incharge of conduction. (1mk)

9. (a) Y – intercept , 55m;
(b) Body moves in the negative /reverse /opposite direction ;or W.T.E at constant velocity

10. Pressure difference = 760 – 580 = 180mmHg;
P = dgh - 0.18 x 10 x 13600 = 1.3 x h x 10; (3mks)
$H = \frac{0.18mx13600}{1.3} = 1883$ .1m;

11. 

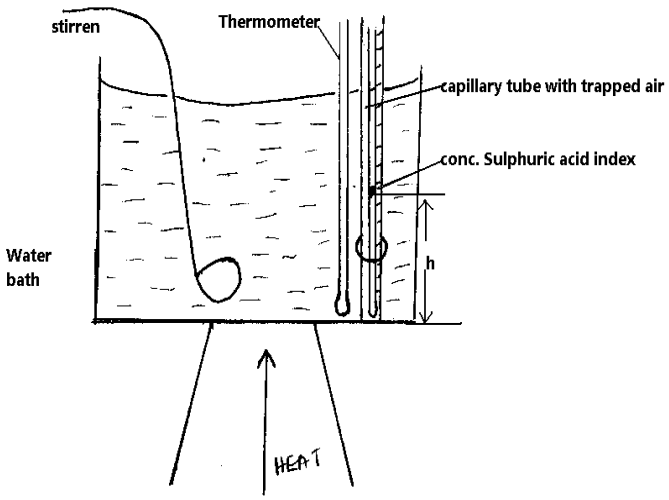
; (1MKS)

12. 6(i) easier to operate;
Reasons:
a. V. R is higher in 6(ii); low efficiency.
b. In 6(ii) there is work done in moving up the pulley; (3mks)

13. (i) A monolayer / one cell thickness film is formed
(ii) A perfectly circular patch is formed
Any 1 x 1 = (1mk)

SECTION B:

14 (a) The volume of a fixed mass of a gas is directly proportional to its absolute temperature, provided the pressure is kept constant; *Reject temperature*
(1mk)



Workable diagram ;

- Note initial height Lo_1 of sulphuric acid index and the temperature T_o of the water bath;
- Heat as you stir to ensure uniform distribution of heat and take the thermometer readings and the corresponding height of sulphuric acid index which is proportional to volume;
- Repeat for several values of absolute temperature; and height and tabulate as shown;

Temperature T	T_0	T_1	T_2	T_3	T_4	T_5
Height (cm)	L_0	L_1	L_2	L_3	L_4	L_5

Plot a graph of height against temperature which is a straight line and passing through origin; or find $\frac{L}{T}$ = constant. L is proportional to volume. (6mks)

(ii) Used as a drying agent

(iii) $\frac{V_1}{T_1} = \frac{V_2}{T_2}$; $\frac{0.006m^3}{343} = \frac{0.0014}{T_2}$, $T_2 = \frac{0.0014x343}{0.006}$; = 80K;

(3mks)

15. (a) See graph

M/N

(5mks)

(b) (i) Spring constant K = $\frac{DF}{DL}$

Slope = 1.5 x 10^{-2};
/ slope / = 1.5 x 10^{-2};
K = $\frac{1}{1.5}$ x 10^{-2} = $\frac{1}{1.5}$ x 10^{-2} = 0.67 x 10^{2} = 67N/cm; (3mks)

(ii) Y - intercept, 30cm; (1mk)

(c) F = KE ; F = 5.5N
K = 67N/cm
5.5 = 67 x E;
E = $\frac{5.5}{67}$ = 0.082cm; (3mks)

16. (i) If a fluid is non viscous , incompressible and flows steadily; the sum of pressure, kinetic energy per volume and potential energy per volume is always constant i.e P + ½ PV^2 + pgh = K;

(ii)

(2mks)

(a) B;
More streamlined i.e do not cause eddies behind it. (2mk)

(iii) $a_b V_b = a_a V_a$;
a_b = $\frac{22}{7}$ x 2.5 x 2.5
a_b = 19.6cm^2
19.64 cm^2 x V_b = 45cm^3/s;

$V_b = \frac{45}{19.64}$

$V_b = 2.291$ cm/s; (3mks)

17. (a) When a body is partially or fully submerged in a fluid , it experiences an upthrust force which is equal to the weight of fluid displaced; (1mk)

(b) Volume = ½ πr^2 x h = ½ x 3.14 x $\frac{7}{2}$ x $\frac{7}{2}$ x 12;

$= \frac{923.16cm^3}{4} = 230.79cm^3$; (2mks)

(ii) Upthrust = wt of liquid B displaced
M = v x d
= $230.79cm^3$ x $1.2g/cm^3$; = 276g = 0.276Kg
W = mg = 0.276 x 10 ; = 2.76N
Upthrust = 2.76N; (3mks)

(iii) Upthrust = wt of liquid A displaced
V = $230.79cm^3$
M = v x d = $230.79cm^2$ x $0.8g/cm^3$;
m = 184.63g = 0.18463Kg;
w = mg = 1.846N
= 1.846; (3mks)

(iv) A floating body displaces its own weight on the fluid it floats.
Total weight displaced = 1.846 + 2.76N
= 4.606N;
$M = \frac{w}{g} = \frac{4.606}{10} = 0.4606$Kg; (2mks)

18. (a) Latent heat of fusion of a substance is the amount of heat required to change a unit mass of a substance from solid to liquid without change in temperature; (1mk)

(ii) $15^0C - 0^0C$ at 0^0C $0^0 - -10^0C$

A B C $A=MC\Delta\theta$

$B=ML_f$

A = MCDθ B = MLf C = MCDθ

Total energy = A + B + C
83600J = (M x 15 x 4200) ; + (M x 3.34 x 10^5); (M x 2100 x 10);
= 63000M + 334000M + 21000M
= 418000M.

$M = \frac{83600}{418000}$; = 0.2Kg;

(5mks)

(b) (i) Steel index; marks the level of maximum temperature
(ii) Allows room for expansion – is compressed when temperature are high and stretched when temperatures are low
(iii) Mercury and alcohol contracts making index A to drop and B to rise. The minimum liquid arm contracts more than the maximum arm stretching the expansion space mercury pulled up the minimum arm pushing index B.

(v) Magnetic material e.g. steel, iron, cobalt nickel etc.