0472

232/1 MS
PHYSICS
Paper 1
MARKING SCHEME
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THE KENYA NATIONAL EXAMINATIONS COUNCIL

KENYA CERTIFICATE OF SECONDARY EDUCATION

PHYSICS

Paper 1

MARKING SCHEME
(CONFIDENTIAL)

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This marking scheme consists of 7 printed pages.

SECTION A (25 MARKS)

1.	Micrometer screw gauge.	1
2.	The level rises – cohesive forces become weaker on heating.	2
3.	It states that gases are made up of tiny (invisible) particles which are in constant random motion.	1
4.	a) 9.5 Pa b) Pressure	1 1
5.	a) Stable equilibrium b) Returns to original position after slight displacement.	1 1
6.	Sum of clockwise moments = Sum of anticlockwise moments $4 \times x = 8 \times 30$ $4x = 240$ $x = 60cm$ Position of string = 60 + 20 = 80cm	3
7.	Forces of attraction between molecules of the same type.	1
	Container A It's a better heat conductor.	2
	Due to the shape, the wind at the top moves at a higher speed creating a region of lower pressure at the top. The pressure difference between the top and the inside produces an upward force causing the roof to be blown off.	2

10.	At maximum heigh V =0 Displacement = Area under the graph $= \frac{1}{2} \times 2 \times 20$ = 20m	3
11.	The spirit extracts latent heat of vapourisation from the palm to evaporate. This causes cooling in the palm as it evaporates.	2
12.	(i) Reads a smaller valve than the weight of the box (weightlessness) (ii) Reads the actual weight of the box. (iii)Reads a value bigger than the weight of the box.	1 1 1
13.	As it sinks upthrust increases and stops when the upthrust is equal to the weight of the object.	1

- Motion against gravity therefore g is negative

$V^2 = u^2 + 2gh$.
$0 = 20^2 - 2 \times 10h$.
$h = \frac{400}{20} = 20m$

$H_{max} = \frac{u^2}{2g}$
$= \frac{20^2}{2 \times 10}$
$= 20M$
* g ≠ -ve

$S = ut + \frac{1}{2}at^2$
$h = ut - \frac{1}{2}gt^2$
$h = 20 \times 2 - \frac{1}{2} \times 10 \times 2^2$
$= 40 - 20$
$= 20M$.

deny; vapourises.

Reading reduces / Pointer moves to the left / deflect to the left
Constant / nothing happens / Reading remains / Pointer remains stationary.
higher / greater / increases / Pointer Moves to the right / deflects to the left. deny; Mass of the box.

density of the water / A body displaces its own weight

eject; displaces its own weight on a fluid.

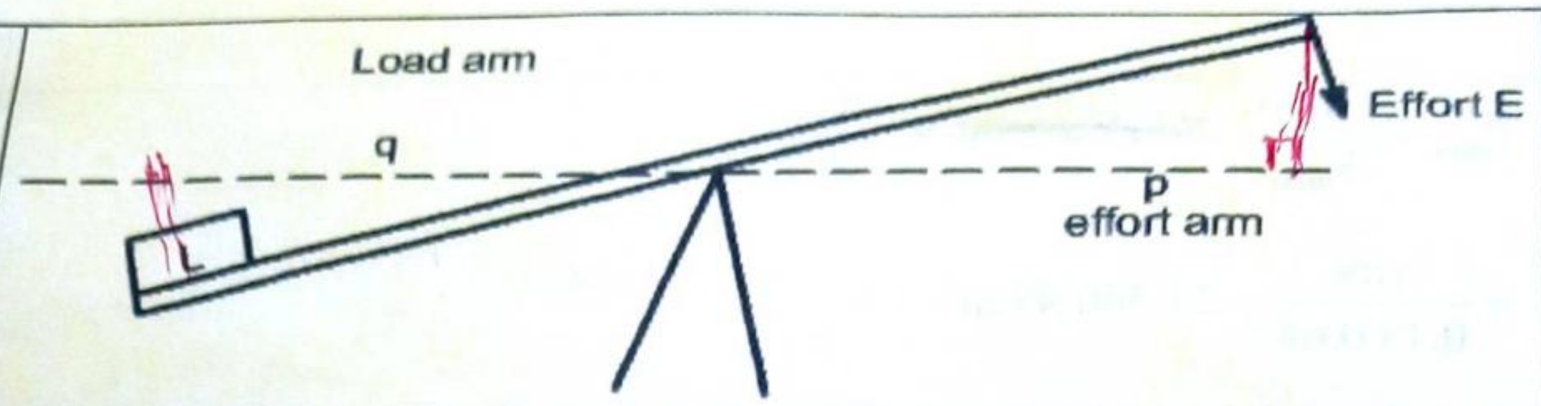
11, 12, 13

SECTION B (55 MARKS)

14. (a)	(i) - Weight of the bucket / force of gravity / Gravitational force. reject Symbol - Tension on the string ✓ both forces / tension and weight	2
	(ii) Part of the centripetal force required is provided by the weight, they both act in the same direction therefore the tension will be less. / Centripetal force is provided by both weight and tension	2
	(iii) - Water is likely to pour out. ✓ - At a certain minimum speed, the centripetal force is less than what is required to keep the motion therefore some water spills out (T=0). / the bucket / the body is moving at a speed less than critical speed.	2
(b)	$F = T = \frac{mv^2}{r}$ ✓ $= \frac{0.04 \times 12 \times 12}{1}$ ✓ $= 5.76N$ ✓	3
15. (a)	(i) Upon sucking, the liquid flows in the delivery tube but stops on releasing because the sucking force is withdrawn. ✓ Liquid flows because of a pressure difference	2
	(ii) The liquid fails toflow on release because there is no pressure differene to push the liquid up the tube without sucking, the level of the container is above the liquid level. /	2
(b)	Upon squeezing the sides of the bottle, the pressure inside the bottle increases forcing more water to enter the test-tube. ✓ This increases the average density of the test-tube and its content hence it sinks. / upthrust decrease	3

(c)	$P_{max} = \frac{F}{A_{min}}$ = (~~don't award~~ $P = \frac{F}{A}$) $= \frac{188}{0.1 \times 0.08} = 23,500 N/m^2$	3
16. (a)	(i) By measuring the temperature of water since the temperature of air is equal to that of water.	2
	(ii) By measuring the length of the air column. Volume of air is proportional to the length since the cross-sectional area is uniform.	2
	(iii) Keeping the tube ~~verticle~~ and open throughout the experiment.	1
	(iv) – Obtain several values of volume V and Temperature T -Plot a graph of volume against absolute temperature. - A straight line through the origin is obtained showing that Charles' law is obeyed.	3
	(v) Stirring water before taking and recording temperature and volume.	1
(b)	$\frac{V_1}{T_1} = \frac{V_2}{T_2}$ $V_2 = 2V_1$ $T_2 = \frac{2V_1}{V_1}(20 + 273) = 586K$ $= 586 - 273 = 313°C$	4

17. (a)



2

(b) (i) Effort distance = 2 load distance

= 2 x 2

= 4m ✓

or

2+2=4M

V.R = Effort distance / Load distance

Effort distance = 2 X 2

= 4M.

*working is a must.

1

(ii) Work done

F × d

= 5 × 10 × 2

= 100J

Accept NM

3

(iii) PE = Work done

= 100J

Accept NM

PE = Mgh = 5 x 10 x 2

= 100J

Accept T.E or worked out value

1

(c) (i) Obtain the difference between the initial reading of the balance and the final reading of the balance.

(Mass = (Initial reading of the balances – Final reading at the)

1

(ii) E = 500t

Q = 500t

W = 500t

Reject; E = Pt.

1

(iii) Heat supplied = Heat gained by steam

500t = ML_v

$L_v = \frac{500t}{m}$ Jkg^{-1}

Pt = MLv

Units is a must.

*density

Q = ML

3

Accept Eqot = M2 - M1 Lv

18. (a)	Matter is anything that occupies space and has mass.	1
(b)	As the temperature increases, the molecules of the liquid gain more kinetic energy. This increases the speed of motion of the molecules hence they move faster, travel further and increase in intermolecular distances causing increase in volume.	3
(c)	(i) To magnify the pollen grains for better visibility.	1
	(ii) They are observed to move in random motion.	1
	(iii) They are being hit by the invisible water molecules which are in constant random motion hence also move in random motion.	2
	(iv) - Rate of random motion of the pollen grains increases. - Increase in temperature of water increases the kinetic energy hence water molecules move with higher speed knocking the molecules of pollen grain faster.	3