PHYSICS FORM THREE PP1 MARKING SCHEME

COMMON EVALUATION - EMBU DISTRICT

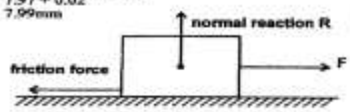
Kenya Certificate of Secondary Education

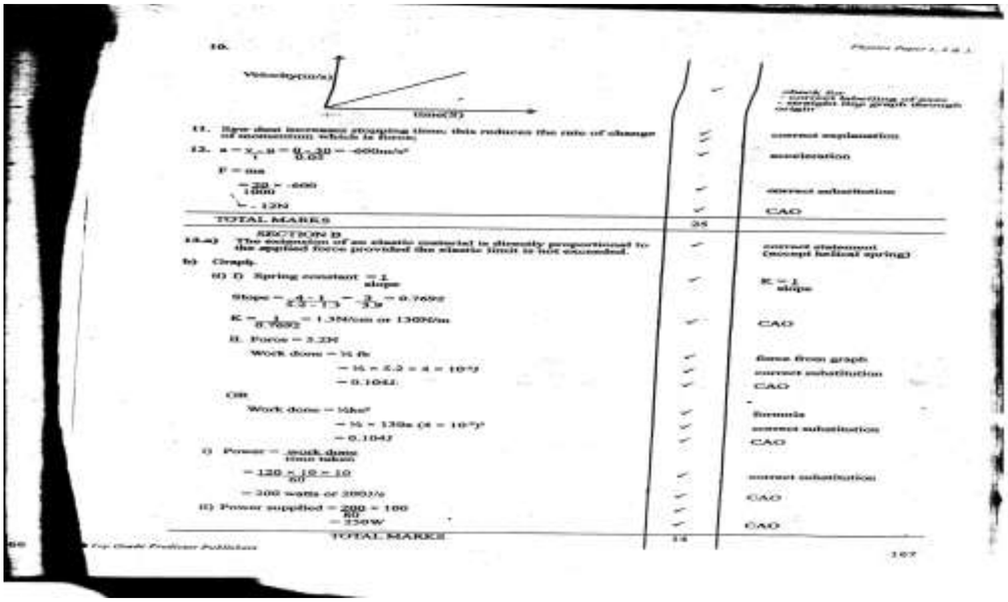
PHYSICS

Paper - 232/1

July/August 2010

Marking Scheme

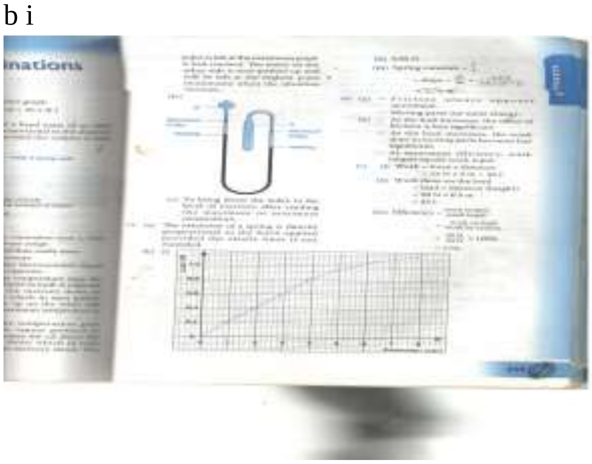
1. Actual diameter = (7.50 + 0.47) + 0.02 = 7.97 + 0.02 = 7.99mm	✓ ✓	CAO
2. 	✓ ✓	normal reaction } directions must be friction force } correct
3. $\frac{F_1}{A_1} = \frac{F_2}{A_2}$ or $F_1A_2 = F_2A_1$	✓	correct formula
$F_1 \times \pi(\frac{d}{2})^2 = 10 \times \pi \times (\frac{2d}{2})^2$	✓	correct substitution
$F_1 \times \frac{d^2}{4} = 10d^2$		
$F_1 = 40N$	✓	CAO
4. - Temperature - Density of the gas	✓	Any 1 correct answer
5. - when there is fire, temperature rises, mercury expands and touches terminal X; circuit is completed, current flows and the bell rings;	✓	correct explanation
6. - water in container A - cold water in denser than warm water, hence sinks to the bottom setting up convection currents.	✓ ✓	correct explanation
7. Clockwise moments = anticlockwise moments. $W \times \frac{40}{100} = \frac{50}{1000} \times 10 \times \frac{10}{100}$	✓	correct substitution
$40W = 5$ $W = 0.125N$	✓	correct value of weight W
Tension in the string = 0.5 + 0.125 = 0.625N	✓	correct value of T.
8. - it has a wide base area - has a heavy base	✓ ✓	
9. $A_1V_1 = A_2V_2$	✓	correct formula
$1.5 \times \frac{10}{2} = 1.5 \times 10^{-2}V_2$	✓	correct substitution
$V_2 = \frac{1.5 \times 5}{1.5 \times 10^{-2}}$		
= 500cm/s or 5m/s	✓	C.A.O



SECTION B 55MKS

13. The extension of a spring is directly proportional to the force applied provided the elastic limit is not exceeded.

b i



A - 1mk
S – 1mk
P – 2mks
L – 1mk

ii 0.80N

iii) Spring constant =

= slope = = $\frac{0.8\ N}{3.8 \times 10^{-2}\ m}$

= 21N m^{-1}

14. A flow in which every particle of fluid passing a point follows the path of the preceeding particle.

b i)

ii) The above awing moves faster than the air below. Pressure above wing is reduced. The resulting pressure difference creactes a lift.

c) $A_1v_1 = A_2v_2$

$A_1 = \pi(2.6cm)^2$

$A_2 = (0.65cm)^2$

$\pi(2.62)cm^3 x\ v_1\ m\ s^{-1}$

$= \pi(0.652)cm^2 \times 3m\ s^{-1}$

v1 = 0.19m s^{-1}

15. a) When one sucks from the straw the pressure inside the straw is reduced. This allows the atmospheric

pressure on the surface of the milk topush the milk up the straw and into the mouth.

b i) oil is incompressible

ii) When the driver steps on the foot pedal, the force is transmitted through the level system to the piston in the master cylinder. The pressure produced in the master cylinder is transmitted through the fluid to the wheel (or slave) cylinders where the pistons in turn push the brake shoes outwards. When the brake shoes are pushed out, the brake-lining presses on the rotating wheel causing the car to slow down or to stop.

iii) Air is compressible and so the force exerted would be partially used to compress the air instead of pushing out the break shoes.

c)Pressure in both cylinders is the same\

pressure in the plunger (small piston)

$= \frac{500N}{0.026^2 \pi m^2}$ (1mk)

force in larger piston = PA

$= \frac{500N}{0.026^2 \pi m^2} Nm^{-2} \times 0.16^2 \pi m^2$ (1mk)

= 18935N (1mk)

16. a) i) Fast moving air molecules move continuously and randomly and collide with the smoke particles.

ii) Larger particles may not be moved much by the fast moving air particles.

iii) Increase in air temperature would increase the speed of air molecules and hence the number of collisions would be more.

b i) Volume of the oil drop

$= \pi^3 =$ x 3.14 x 0.035^3 cm^3 (1mk)

let the thickness be = x

volume of the patch = $\pi R^2 x$

= 3.14 x $(37.5)^2$ cm^2 × x

Volume of the patch = volume of the oil drop.(1mk)

3.14x $(37.5)^2$ cm^2 × x = x 3.14 x $(0.035)^3$ cm^3

x = x $(0.035)^3$ cm^3 x $\frac{1}{(37.5)^2}$ (1mk)

= 4.066 x 10^{-8}cm

= 4.066 x 120^{-10} m

= 4.1 x 10^{-10} m. (1mk)

ii) – the oil does not evaporate

- the oil spreads to a one molecule thick layer.

17. n = (1mk)

= 3 x 10^8

1.88 x 10^8 (1mk)

= 1.596

= 1.6 (1mk)

b i)

ii Sin C = (1mk)

= (1mk)

C = 38.8° (1mk)

c) n = $\frac{\sin \theta}{\sin r}$ (1mk)

1.596 = $\frac{\sin \theta}{\sin 21.2}$ (1mk)

θ = 35.25 (1mk)

18. period (T) = 1.65

ii) Amplitude = 4cm

iii) = fy

^=

f = = = 0.625 (1mk)

^

= 6.4 m (1mk)