KENYA NATIONAL EXAMINATION COUNCIL
REVISION MOCK EXAMS 2016
TOP NATIONAL SCHOOLS

PRECIOUS BLOOD HIGH SCHOOL
232/1
PHYSICS
PAPER 1
MARKING SCHEME

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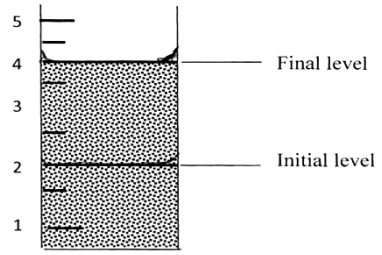
PRECIOUS BLOOD SCHOOL KCSE TRIAL AND PRACTICE EXAM 2016

Paper 1

MARKING SCHEME

SECTION A

1. A packer pen was accidentally dropped into a measuring cylinder containing water. The volume of water moved from initial level to form the level as shown below:



If the mass of the parker pen is 0.012kg determine its density (2mks)

Volume of packer pen = 4.00 -2.00

= 2.00cm^3

$\rho = \frac{m}{v} = \frac{0.012}{2 \times 10.6}$ = 6000kg/m^3 or 6g/cm^3

2. The figure below shows some forces acting on an object

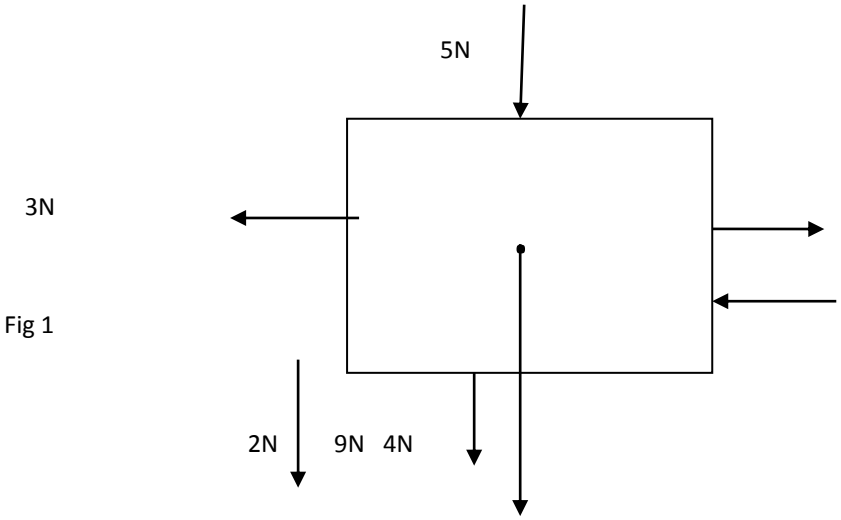
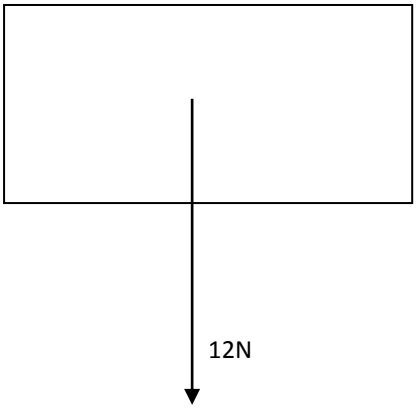
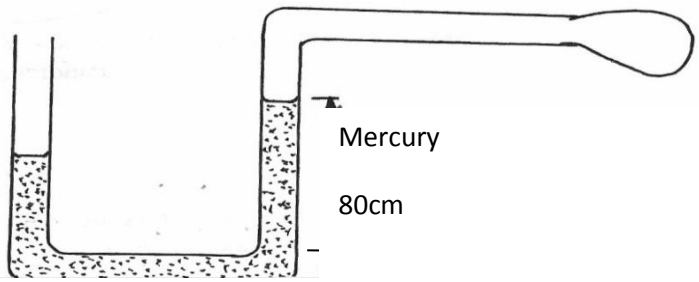


Fig 1

On the figure below draw the resultant force acting on the object



3. Figure thetwo below shows the apparatus used to examine the pressure of a gas



Taking density of mercury to be 13,600kg/m^3 standard atmospheric pressure 100,000N/m^2 (3mks)

Type equation here.a = Phg + pg P_a = Ṗhg +p_g

Ṗg = Ṗa - Ṗhg

= 100,000- 13,600 x 0.2

= 100,000- 2 + 200

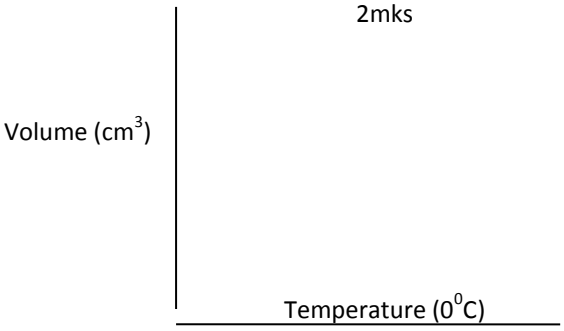
= 72,800 N/m^2

4. Explain why it is possible to compress gases but not solid or liquid

Gasses have larger intermolecular spaces compared to solid or liquid

5a)On the axis provided , sketch a graph of volume against temperature of water from O^o C to 20^0 C

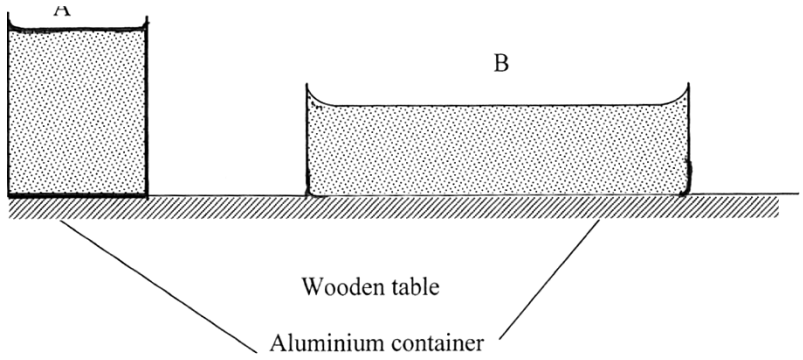
2mks



b) During anomalous expansion of water , heat transfer is limited to conduction and radiation only explain (1mk)

water is a poor conductor of heat

6.Figure 3 show two aluminum container A and B placed on a wooden table , Containers A and B have equal volume of hot water initially at the same temperature



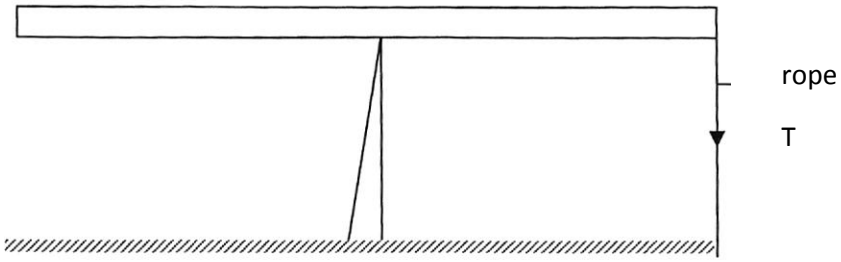
Explain why water in B cools faster than water in A

It has a large exposure areas causing move to escape drawing energy from liquid

7. A uniform rod of length 4 m and mass 4kg is pivoted at 3.6m mark. The rod is held horizontally with a vertical rope 4mark as shown below

3.6 m

4m



Calculate tension T in the rope (Take g = 10N/Kg)

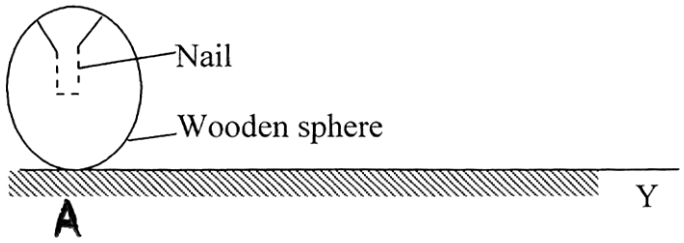
Sum of clockwise moments = sum of anticlockwise moments (4 -3.6)T = (3.6-2) x 40

$T = \frac{1.6 \times 40}{0.4}$

= 160N

8, (a) Define centre of gravity of a body

(b) The figure below shows a wooden sphere with a nail hammered into it a point A as shown below



The sphere is rolled on a horizontal ground and corner to rest after some time at poin

Draw the sphere after it cove the rest at point Y

9. Define the term Heat Capacity (1mk)

10) A girl heats 5kg of water to a temperature of 80^0 C when she adds Mkg of water at 15^o C the mixture attains a temperature of 40^0C .Determine the value of Mi (2mks)

Heat loss by hot water = heat gained by cold water

m= 5x 4200x40

4200 x25

= 8kg

(2mks)

11. State the difference between an ideal and real gas

An ideal is one that obeys all the gas laws accurately at all conditions of temperature and pressure while a real gas does not obey all gas laws . An ideal gas is one in which the molecules are completely free from each other, no forces of attraction between the molecules themselves occupy negligible volume.

12. Define absolute Zero temperature in terms of kinetic energy (1mk)

The temperature at which the internal energy of the body is zero

SECTION B (55 MARKS)

13. a) in an experiment to estimate the diameter of an oil molecule , an oil drop of diameter 0.06cm spread over a circular pallet whose diameter is 20 cm . Determine

i) The volume of the oil drop (2mks)

$V = \frac{4}{3} \prod r^3$

$= \frac{4}{3}$ x 3.143 x $(0.03)^3$

= 1.13112 x 10^{-4} cm^3

ii) The area of the patch covered by oil (2mks)

$A = \prod r^2$

= 3.14 x 10^2

= 314 cm^2

iii) The diameter of the oil moleculer

V drop = V√ patch

$1.1311 \times 10^{-4} = 314 \times t$

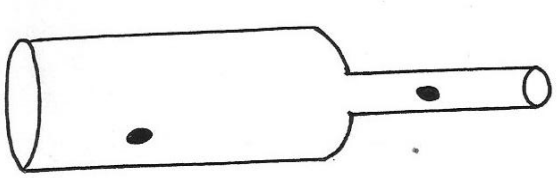
$t = \frac{1.13112 \times 10^{-4}}{314}$

$= 3.6023 \times 10^{-7cm}$

b) state any one assumption made in (ii) above

oil drop in spherical

c) The figure below shows parts A and B of a glass tube



i)State the part of the tube which the pressure will, lowest when air is blown through the tube A to B (1mk

ii)Compare the velocity of air at A and at B

velocity of air at B is higher

ii)what is the relationship between the velocity of air and its pressure at any point along the tube AB

velocity is inversely proportional to pressure /increase in velocity , lower pressure

d) Water flows along a horizontal pipe of cross-section area 35cm and constriction of cross section5 cm . if the speed of water at the construction is 2m/s

Calculate:

i)Continuity constant in SI unit

$A_1V_1 = A_2V_2$ = constant

5 x 10-4 x2 = $0.001m^3/s$

ii) the speed in the wide section

$0.001m^3/s = 35 \times 10^{-4} \times v_2$

$V_2 = \frac{0.001}{35 \times 10^{-4}} = 0.2857$ m/s

14 . a) State Hooke's law (1mk)

b) The graph provided is of force (y-axis) against extension

GRAPH

i) From the graph determine the work done in stretching spring by 3cm

= Fe = W = ½Fe

= ½ x3 x 0.03

= 0.045J

ii) use the graph to determine the spring constant

spring constant = gradient

gradient $= \frac{4-1}{(4-1) \times 10^{-2}}$

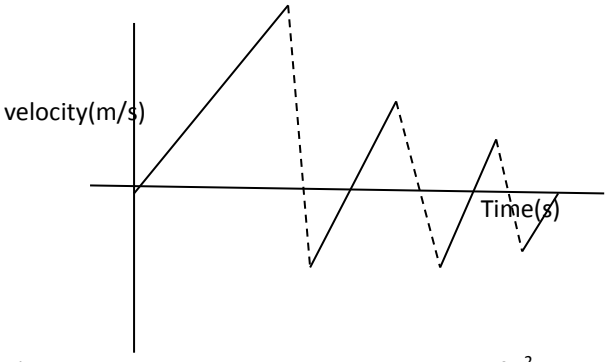
$= \frac{3}{3x10^{-2}} = 100$ N/m

iv) State two factors that affects the spring constant

Diameter of the spring

Number of turn per unit length

15a) On the grid provided ,sketch a velocity time graph of a bouncing bal dropped from rest at a height of 2.5cm (2mks)



b) The graph provided below shows a graph of v^2 against the distances travelled by a body projected vertically upwards at appoint on earth surface

i) From the graph calculate the gravitation acceleration of the earth (g) at that point

iii) Using the graph determine the initial velocity of the body (3mks)

iii) The maximum height attained of the body (2mks)

c) A body is uniformly accelerated from the rest to final velocity of 50mls in 6 seconds . Calculate the distance covered (2mks)

$s = ut + ½ at^2$

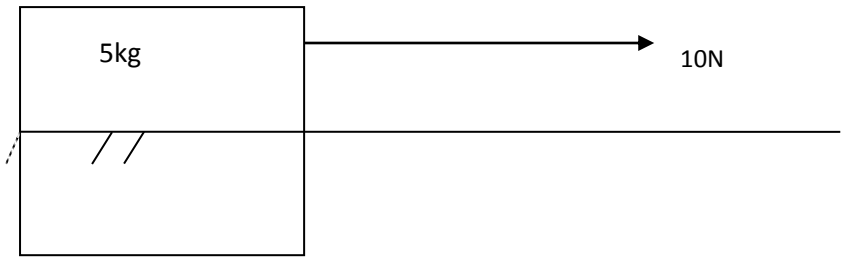
$= 0 \times 6 + ½ - \frac{50-0}{6} \times 10^2$

$= ½ \times \frac{50x100}{6}$

$= \frac{833.33m}{2} = 416.67m$

16, Why does a gun recoil when it is fired

When the bullet is fired , the gun has a momentum equal to that of the bullet but in opposite direction



Find the

i) Acceleration of the body (2mks)

T- Fr = ma

$a = \frac{T - \mu mg}{m}$

$= \frac{10 - .03x5x10}{5}$

$= 1.7mls^2$

ii) Velocity of the body after the 4 meters (2mks)

$V^2 = U^2 + 2as$

$V = \sqrt{U^2 + 2as}$

$= \sqrt{0 + 2x17x4}$

$= \sqrt{13.6} = 3,6878$

iii)Kinetic energy of the body after the 4 meters (2mks)

$k.e = ½mv^2$

= ½ x 5 x $\sqrt{13.6}^{2}$

b) i) Define the term regular velocity

ii) A particle moving along a circular path of radius 3.0 cm describes an arc of length 2cm every second . Determine

i) Its angular velocity (2mks)

$w = \frac{v}{r}$

$= \frac{0.02}{0.03}$

= 0.667 rad/s

ii) Its periodic time

$T = = \frac{2\pi}{w} \frac{2x3.142}{0.667}$ = 9.421 *seconds*

ii) A stone of mass 40g is tied to the end of a string 50cm long and whirled in a vertical circle at 2 revolutions per second . Calculate the maximum tension in the string (2mks)

Maximum tension = $Mw_{2+}mg$

= $2_{\Pi}f$

= 2x 3.142 x2

= 12,568 rad/s

Maximum Tension = $\frac{40}{1000}$ x $(12.568)^2$ x 0.5

$+\left(\frac{40}{1000}x10\right)$

= 31.5,909N

17a) Sometimes work is not done even if there is an applied force . Give reason (1mk)

b) A lorry weighing 6400 is lifted with a Jack screw 0f 11mm pitch . If the handle is 28 cm from the screw

i) Find the velocity ratio

$V:R = \frac{2\pi R}{pitch} = \frac{2x3.14x0.28}{0.011}$

$= 159.956$

ii)Neglecting the frictional force . Calculate mechanical advantage ,MA (1mk)

Neglecting friction MA =V.R = 159.956

iii)Determine the force applied (2mks)

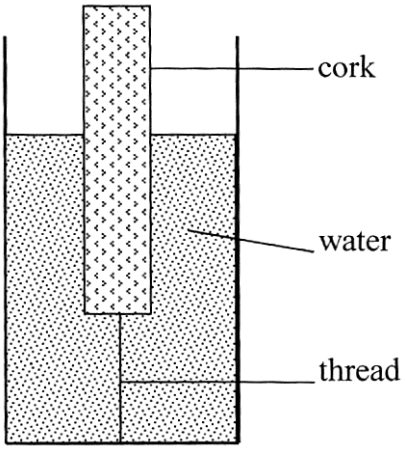
$M.A = \frac{L}{E}$

$159.956 = \frac{64000}{E}$

$E = \frac{64000}{159.956}$

= 400.11N

c) The figure below shows a curve floating on water and held to the bottom of the beaker by a thin thread



i)Name the forces acting on the curve
(3mks)

- Up thrust
- Weight of cork
- Tension on thread

ii)State how each of the forces mentioned (i) above changes when water is added into the beaker until it fill up
(3mks)

- Upthrust increases
- Weight remain constant
- Tension increases