SURNAME …….. FIRST NAME ……..

JUNIOR SCHOOL …….. SENIOR SCHOOL ……

SupaScience

COMMON ENTRANCE EXAMINATION AT 13+

SCIENCE

LEVEL 2

PHYSICS

Practice Paper 1

Please read this information before the examination starts

- This examination is 40 minutes long.
- The answers should be written on the question paper.
- Answer all the questions.
- A protractor may be helpful.
- Calculators may be required.

1. a) If the frequency of a note increases then

it sounds louder **the pitch decreases**
the pitch increases **it will sound softer**

b) The north seeking pole of a magnet will be repelled by

another north seeking pole **a south seeking pole**
an unmagnetised piece of iron **a piece of brass**

c) A block measures 5 cm, by 5 cm, by 8 cm. It has a mass of 400g.
The volume of the block is

200 cm^3 **400 cm^3** **200 g** **18 cm^3**

d) The bending of light is called

reflection **refraction** **dispersion** **transmission**

e) Sound travels fastest through

a vacuum **air** **solids** **liquids**

f) A rock has a mass of 6kg and a volume of 3000cm
It's density in g/cm^3 is

0.002 **0.5** **2** **500**

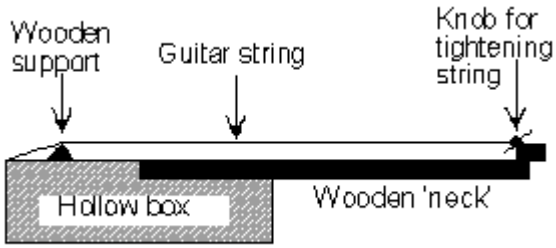
g) The second planet from the Sun in our solar system is

Mercury **Earth** **Venus** **Mars**

h) The energy stored in a spinning disk is mostly

potential **chemical** **heat** **kinetic**

2. A boy wished to investigate the sound produced when a guitar string is plucked.



For each question which follows, use one of the answers below

get louder ***get softer*** ***get higher*** ***get lower***

a.) What would happen to the sound if the string were made tighter?

. . . . . ***. Get higher***. . . . . .(1)

b.) What would happen to the sound if the string were made shorter?

. . . . . .***Get higher*** . . . . . .(1)

c.) What would happen to the sound if the string were plucked harder?

. . . . . .(1)

d.) What would happen to the sound if the box under the support was not hollow but solid?

. . . . . .***Get louder*** . . . . . .(1)

3. Explain why the puff of smoke given out when a gun fires can usually be seen before you hear the sound of the shot

. . . . . ***because sound travels faster than light .*** . . . . . .(1)

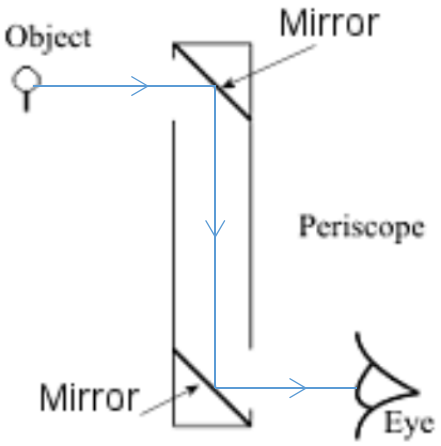
4.. If the moon exploded tonight we would see the explosion but not hear it.

Why would we not be able to hear the moon explode?

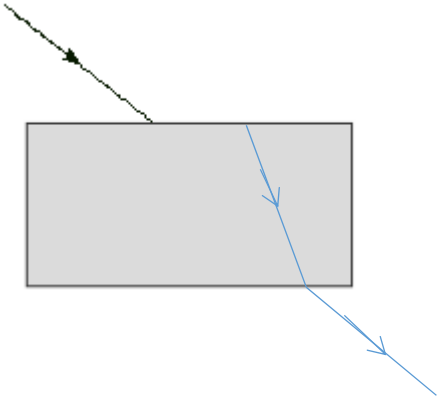
. . . . . .***Bacause sound cannot travel through the vacuum of space*** . . .. (2)

5. The diagram shows a periscope for looking at objects which might otherwise be out of sight.

Draw in a ray of light to indicate how we see the object (remember to put arrows on the ray so we can see in which direction the light moves) (2)



6. .The diagram shows a ray of light hitting a glass block

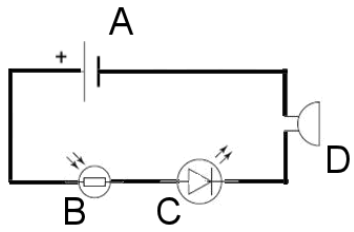


a.) Complete the diagram to show what happens to the ray as it passes through the block (2)

b.) What name do we give to the bending of light?

. . . . . ***Refraction .*** . . . . . (1)

7. Peter made the circuit below which containing several components.



Name the components represented by the symbols A, B, C and D

*A= ……****Cell……***

*B=……****Light Dependent Resistor (LDR)……***

*C=……****Light Emitting Diode (LED)****……*

*D=……****Buzzer****……*

Peter noticed that the LED glowed brighter when a torch was shone on the circuit.

Explain why the LED became brighter

……***An LDR has a low resistance in the light. This allowed more current to flow so the LED became brighter……***2

What do you think might happen to the sound of the buzzer if the circuit was put into a light-proof box

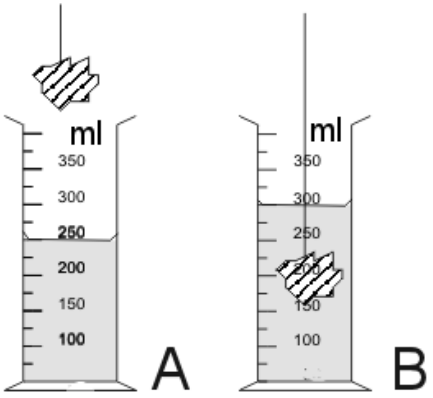
……***The buzzer would get quieter (because the resistance of the LDR increased)***……1

Suggest a use for this circuit and explain what it does

A brief case alarm. The buzzer will start when the case is opened ……..2

(1 mark each)

8. A measuring cylinder is filled to the 250 cm^3 mark with water (figure A).



Sophia takes a lump of material of mass 400g and gently lowers it into the water. (figure B)

a) What volume of water is shown in measuring cylinder B?…….**300ml**……(1)

b) What is the volume of the material? . . . . . **. 300-250 = 50cm^3** . . . . . .(1)

c) Calculate the density of the material. Be sure to show all your working

. . . . . .***Density = mass / volume*** *(1 mark).* ***. . . . . .***

. . . . . Density = 400 / 50. . . . .*1 mark.* ***. . . . . .***

. . . . . .Density = 8 g/cm^3 . . . . . .1 mark for number, 1 for unit. .

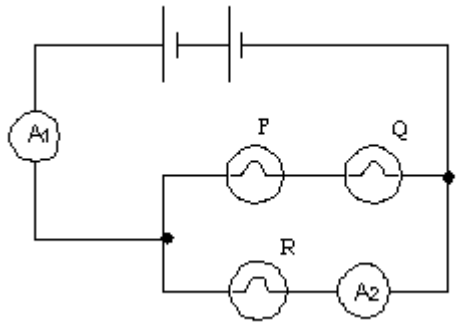
. . . . . .

. . . .(4)

9. Study the circuit shown and answer the questions which follow.

A1 and A2 are ammeters.

The lamps P, Q and R are all similar.



a) How does lamp P compare in brightness to lamp R.

Underline the correct answer **Lamp P is brighter than lamp R**
<u>Lamp P is dimmer than lamp R</u>
Lamp P is the same brightness as lamp R (1)

b) Ammeter A1 reads 0.3A. What will be the reading on ammeter A2?

0.4A **0.3A** **<u>0.2A</u>** **0.1A** (1)

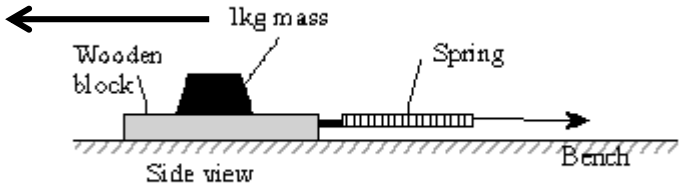
c) If lamp Q were unscrewed from its holder what would happen to the reading on ammeter A1

Underline the correct answer **go up** **<u>go down</u>** **not change** (1)

10. The diagram shows the apparatus used by boy to pull a block of wood along a bench with a spring.

There is a 1kg mass resting on the block. The block has a spring attached to it.

The spring has an unstretched length of 5cm but becomes 15 cm when the block is being pulled along.



a.) What is the name of the force which is slowing the block down, causing the spring to stretch?

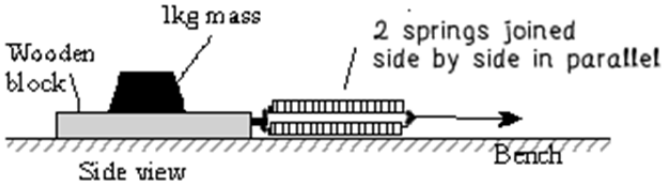
. . . . . **. Friction** . . . . . (1)

b.) Mark an arrow on the diagram to show the direction of this force. (1)

c) Calculate the extension of the spring while the block is being pulled along?

. . . . . **15cm-5cm=10cm .** . . . . . (2)

11 The boy decided to repeat the experiment but this time joined two springs side (in series). He kept all other aspects of the investigation the same.



a.) What is the new extension of the spring (explain your answer)?

. . 10 / 2 =. . . . **5cm .** . . . . . .

. The load is shared between the two springs so each spring has half the load it had before. This makes it stretch half the amount . . . . (2)

b.) What changes do you think the boy would have noticed if he repeated the experiment but this time put rollers under the block (explain the answer):

. . . . . ***.The springs would not stretch so much because the roller would make the friction less. .*** . . . . . (2)

12.The American Apollo Space Programme sent manned satellites to the Moon and back.

The fuel for the rocket consists of hydrogen and oxygen

The distance from the Earth to the moon is, on average, 384 000 km.

After launch, the satellite spends a few hours in orbit around the Earth.

a) What force causes the satellite to remain in orbit around the Earth?

. . . . . **Gravity .** . . . . . .(1)

b) What form of **energy** does the rocket have:

i while waiting to take off. . . . . **Chemical energy.** . . . . . (1)

ii while on its way to the moon. . . . . **Kinetic energy**. . . . . (1)

13 The mass of the astronaut, with all his equipment, is about 100kg.

The pull of the Earth's gravity is about 10N/kg

a) What is the weight of the astronaut while standing on the Earth?

. . . . . 100 x 10 =1000n . . . . . (2)

b) When the astronaut gets to the moon will his weight be **less than** on Earth, **the same as** on Earth or **zero**? (underline the correct answer)

.**Less** More Zero . . . . . (1)

14. .The surface of the moon was first thought to be soft and powdery to a depth of many cm. The boots that were used on the surface of the moon were very big, with large soles.

Why do you think they were designed with large soles?
(Try to use the words **weight** (or **force)**, **pressure** and **area** in your answer)

Large soles have more area so his weight will be more spread out making the pressure on the ground less ……..(2)

15. State the relationship between pressure, force and area

……***Pressure = Force / Area***…….. 1 mark

(Total Marks: 60)