

YEAR 9 PRACTICE EXAM 1: 2014 [60 marks]

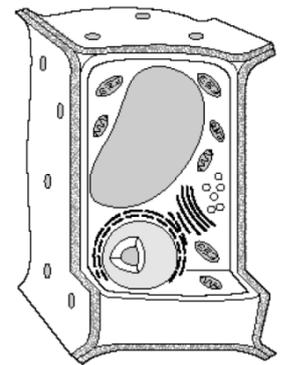
Question One: [3 marks]

(a) The diagram shows a drawing of a cell. Is this a plant or animal cell?

plant

(b) Give THREE reasons for your answer.

*Any 3 of
Regular shape, Cell wall, large central vacuole, Chloroplasts*



Question Two: [4 marks]

Bradley and his class were about to do an experiment in Science.

Bradley waited until the teacher told him to go get the materials. On the way back to his bench, Bradley decided that one material was powdered sugar and the other was coffee powder. Bradley put his nose over the container of coffee powder and inhaled. Bradley likes sugar so he decided to taste it.

(a) Write down one action that Bradley did correctly.

He waited until the teacher told him to go and get the materials

(b) What dangerous thing(s) did Bradley do?

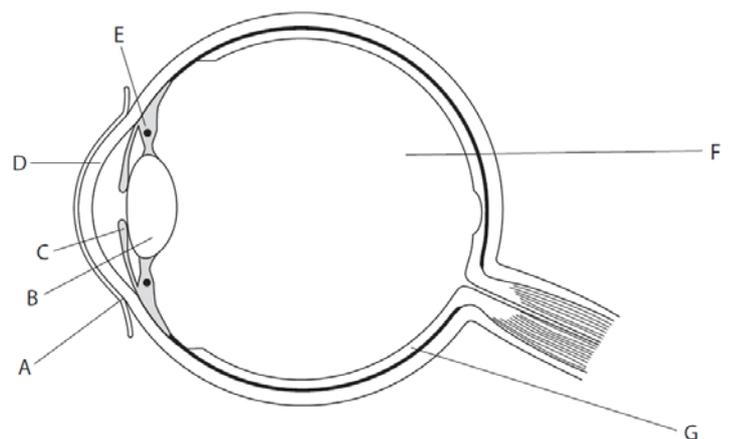
*He sniffed the solid in the wrong / an unsafe way / inhaled
He tasted a chemical in the laboratory*

Question Three: [4 marks]

The diagram shows a section through the human eye. Different parts of the eye have been labelled A to G.

The table lists some health problems that affect the eye and describes how they are caused.

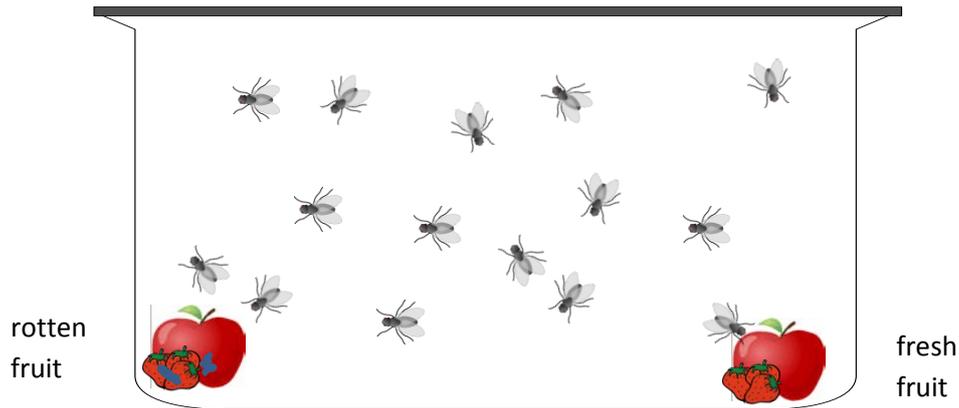
Complete the table by choosing the correct label letter for the part of the eye linked with each health problem. The first one has been done for you.



Problem	Description	Label letter
conjunctivitis	infection of the conjunctiva causing itchy, red and sticky eyes	A
blindness	floaters, spots and flashes of light leading to blindness	G
cataract	clouding of the lens inside the eye leading to decreased vision	B
glaucoma	damage of the optic nerve damage due to increased fluid pressure	F
myopia	cornea is too curved for the length of the eyeball	D

Question Four: [4 marks]

Jordan wanted to find out if flies are attracted to rotten fruit. The experiment was set up as in the diagram.



He released 15 fruit flies into the glass tank containing fresh and rotten fruit. After ten minutes, he counted the number of fruit flies found near the fresh fruit and the number found near the rotting fruit. The table shows his results.

Number of flies	
Near the fresh fruit	Near the rotting fruit
2	13

(a) Name two factors that the student should control (keep the same) in this investigation.

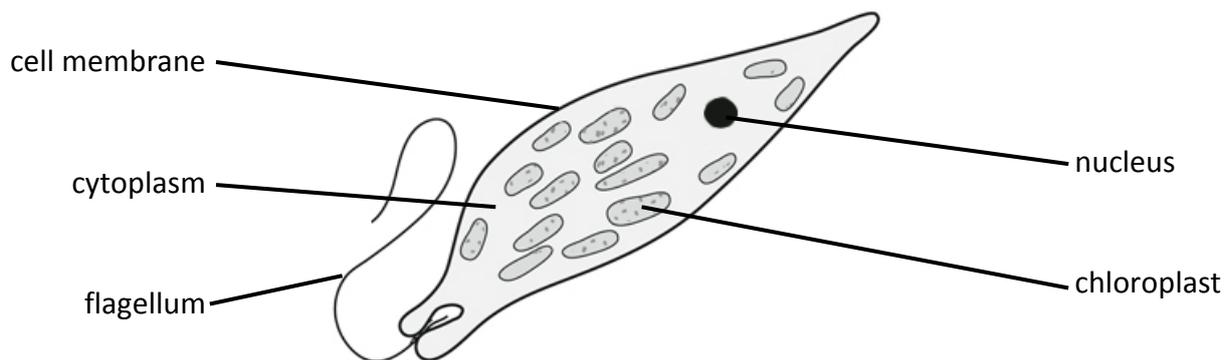
Same amount of fruit, same type of fruit, same light / heat, same temperature

(b) How could Jordan make his results more reliable?

Repeats and averages; spotted outlier results and complete them

Question Five: [4 marks]

The diagram below shows an organism called Euglena. It is unicellular (made of only one cell) and lives in ponds and streams. Euglena have features found in both plants and animals.



(a) Give **two** items of evidence which suggest that Euglena is an **animal** cell and **not** a plant cell.

Any two from: irregular shape, no cell wall, no large central vacuole, flagellum for swimming,

(b) Plant cells can carry out photosynthesis. What structure shows that Euglena can carry out photosynthesis?

chloroplasts

(c) Complete the word equation for photosynthesis.



Question Six: [3 marks]

Many everyday items are made of metal.

The picture shows four objects made of metals or alloys.



(a) Electrical wire is made of copper. Describe a property of copper that makes it suitable for this use.

(very) good conductor of electricity

(b) Some parts of aeroplanes are made of aluminium alloy instead of pure aluminium. The aluminium alloy are used instead of pure aluminium because they (circle your answer)

- A make the aeroplane heavier
- B corrode more easily
- C are more brittle
- D **are stronger**

(c) Give two reasons why gold is a suitable metal to make jewellery.

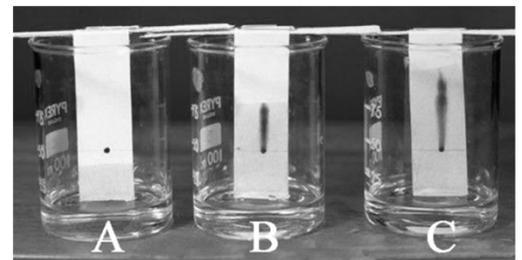
Malleable and/or ductile so it can be shaped

Unreactive so it will not corrode / react with skin / react with food acids etc

Question Seven: [3 marks]

Paper chromatography was used to find the composition of black ink in a pen. The same solvent, paper and pen were used in each of the three experiments shown.

They were started at different times.



(a) Why must the ink dot be placed above the level of the solvent?

If it was below the water surface the ink would just dissolve into the solvent and would not rise up the paper with the solvent and separate into its components.

(b) Why do the dots of ink rise up?

They dissolve in the solvent and are carried up the paper as the solvent rises.

(c) As the ink moved up the paper, colours other than black were seen in B and C. Why?

B and C must have contained a mixture of coloured inks.

Black ink in C and D is not a single substance.

Question Eight: [2 marks]

The picture shows a bird. The bird is classified as a vertebrate.

(a) Why is the bird classified as a vertebrate?

It has a backbone

(b) Is the bird a consumer, decomposer, or a producer?

Consumer



Question Nine: [5 marks]

A student looked a slide of some onion cell epidermis using a light microscope.

- (a) Name the part labelled A that you look through.

eye piece

- (b) Which part (A-F) would you turn to change the magnification?

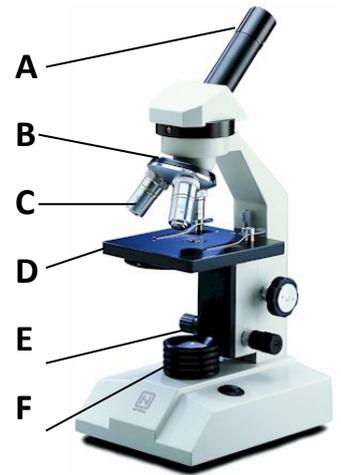
B (to move a different C into place)

- (c) What is the function of the part labelled D in the diagram?

To place the specimen on, on its slide (it is the stage)

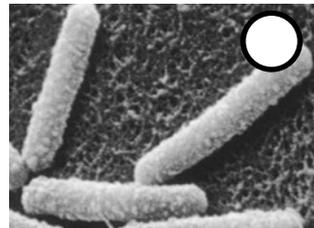
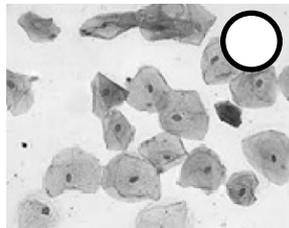
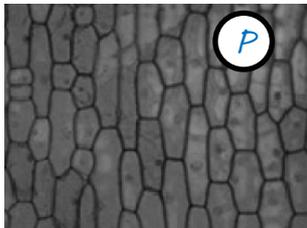
- (d) Part A has a magnification of 10 and the objective lens has a magnification of 40. What is the total magnification?

X400



The images below show three different types of cell as seen using a light microscope.

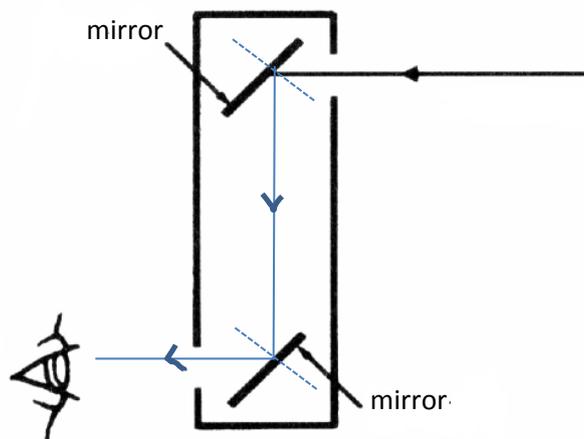
- (e) Write the letter P beside the image of the onion epidermis cells.



Question Ten: [3 marks]

The diagram shows a simple periscope.

- (a) Complete the diagram showing the reflections of the ray of light at both mirrors. Include arrows on the reflected rays.

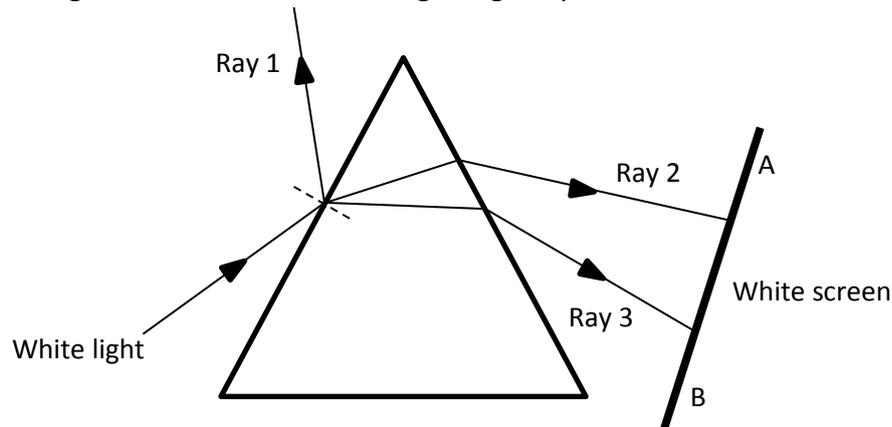


- (b) Describe a use for a periscope.

To look over the crowd at a rugby match if you are short!

Question Eleven: [5 marks]

A narrow beam of white light was shone onto a triangular glass prism as shown in the diagram.



The paths of three rays produced from this ray of white light are shown in the diagram.

- (a) Ray 1 is deflected off the prism as shown in the diagram. What word is used to describe the deflection of ray 1? (circle your answer)

diffraction dispersion reflection refraction

- (b) Rays 2 and 3 enter and leave the prism and change direction each time. What is this change of direction of light called? (circle your answer)

diffraction dispersion reflection refraction

A single ray of white light enters the prism and a band of light of many colours leaves the prism. Just two of the emergent rays are shown in the diagram. The coloured rays are produced from the white light.

- (c) What is this separation of white light into coloured light called? (circle your answer)

dispersion reflection refraction

- (d) Name the colours of light that can be seen at the extreme ends A and B on the white screen.

A: <i>Red</i>	B: <i>Violet</i>
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- (e) What natural phenomenon produces a band of coloured light from sunlight?

rainbow

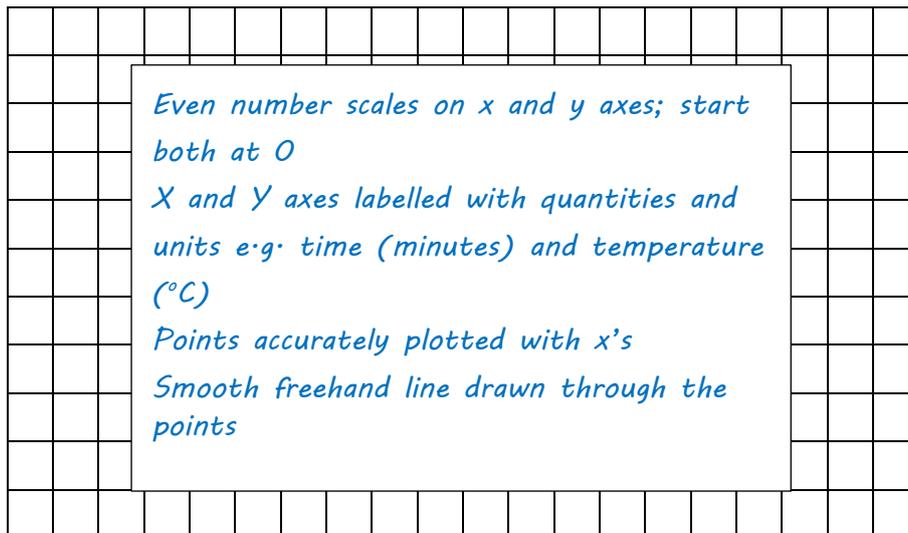
Question Twelve: [5 marks]

A pupil heated a solid chemical (a solid at room temperature) until it had all melted. The chemical was then allowed to cool. The temperature was taken every minute.

The results of this experiment are shown below.

Time (minutes)	0	2	4	6	8	10	12	14	16
Temperature (°C)	47	44	42	42	42	38	37	34	31

(a) Draw a **graph**, using this data, of **temperature (y-axis) against time (x-axis)** in the grid provided.



(b) Explain the shape of the graph that you obtain.

At first it is cooling down.
Between 4 and 8 minutes the substance was freezing / solidifying
It then continues to fall (and will do until it reaches room temperature)

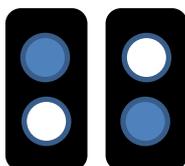
(c) Use the graph or results table to estimate the melting point of the chemical.

The melting point of the substance is 42°C

Question Thirteen: [4 marks]

The photographs show a warning sign for motorists. The rectangular panel above the sign is a photovoltaic (solar) cell. It changes energy from the sun into electrical energy.

The lights flash alternately when the pupils are coming to school and are going home from school.



(a) What type of energy from the sun does the panel change into electricity?

solar

The electrical energy is then changed into a form of energy that can be stored in a battery.

(b) Name the form of energy that can be stored in a battery.

Chemical potential energy

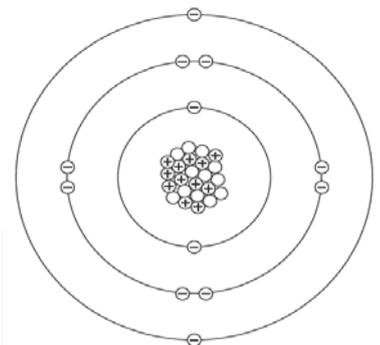
In winter it may be dark when the pupils are going to or coming from school.

(c) Give the energy conversion(s) that occur to produce the flashes of light warning motorists approaching the school on dark mornings.

Chemical → electrical → light (+ heat)

Question Fourteen: [5 marks]

The diagram represents a magnesium atom.



(a) Complete the table to show the name of each particle and the charge of each particle in the magnesium atom.

Particle	Charge
proton	+
neutron	<i>0 / no charge</i>
<i>Electron</i>	-

(b) Draw a ring around the correct answer to complete each sentence.

- (i) In a magnesium atom, the protons and neutrons are in the { cell / core / nucleus / shell }
- (ii) The number of protons in an atom is the { atomic number / mass number / group number }
- (iii) The sum of the protons and neutrons is the { atomic number / group number / mass number }

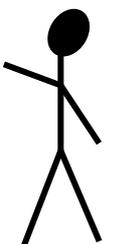
Question Fifteen: [2 marks]

A student stands on the ground with an egg in his hand. He throws the egg vertically upwards. The egg rises to a height of 3 m. Then the egg falls and lands on the ground.

Describe the energy changes of the egg during this sequence of events. Use the words provided. ●

chemical potential ● gravitational potential ● kinetic ● sound

Chemical potential (in muscles of student) is converted into kinetic energy of arm and egg. Moving egg has loses kinetic energy as it rise - but gains gravitational potential energy. As it falls this gravitational potential energy is converted to kinetic - until when it hits the ground, the energy is converted to sound (and heat)



Question Sixteen: [4 marks]

Many organisms are adapted to avoid being eaten.

The photograph shows a Satanic leaf-tailed gecko, which is found in Madagascar, on a leafy branch.



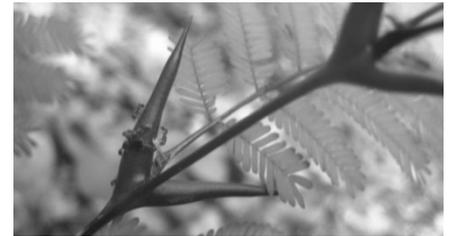
- (a) The gecko is adapted to avoid being eaten by predators. Explain how.

Looks like the leafy branch it lives on (camouflaged)

Ants can give a painful bite. One type of ant lives on acacia trees. Acacia trees have thorns on their branches.

- (b) Why are predators much less likely to eat ants living on acacia trees than ants that live on the ground?

The predators avoid the acacia plants because of the thorns which would make the trees painful to eat. That is why these ants don't get eaten as much.



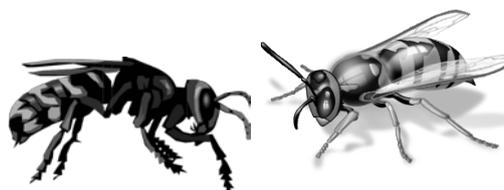
Giraffes eat the leaves of acacia trees.

- (c) Giraffes do not eat the leaves of acacia trees that have ants living on them. Suggest why.

Ants can give the giraffes a painful bite so the giraffes avoid the trees where they can see the ants / after being bitten as they eat the leaves on the tree.



The photographs show a wasp and a hoverfly. Both have black and yellow stripes.



wasp

hoverfly

Wasps have stings, but hoverflies do not.

- (d) Explain how the stripes on the hoverfly help the hoverfly to avoid being eaten by predators.

Many of the predators have learnt by experience that wasps have a nasty sting. As the hoverfly looks like a wasp, potential predators may avoid it, thinking it's a wasp/will sting.