

# Triple Science End of year exam

## Academic year 2015-16

**Prepare** The exams are on throughout during the second week of June. You should use the time from now to then productively by spending **half an hour** or so a night (a couple of hours a day at the weekends) quietly in your room making notes and revising. Just reading through is not revising. Actively complete questions or create revision resources.

During the exams, be ready, have the right equipment. Have the right amount of sleep (8 hours). The more preparation you do now means the less worry you will have later.

Exam Materials – For each of your exams you will need pens, pencils, rubber, sharpener, ruler, protractor, calculator, pair of compasses. Prepare a clear pencil case containing all of your equipment for the start of the exams as it may not be available on the exam day.

### Exam Timetable:

Exam date	Subject	Exam type
6 <sup>th</sup> June	Chemistry	Written paper
7 <sup>th</sup> June	Physics	Written paper
8 <sup>th</sup> June	Biology	Written paper

### Topics to revise for the exam.

#### BIOLOGY

1. Characteristics and classification of living organisms
2. Organisation of the organism
3. Movement in and out of cells
4. Biological molecules
5. Enzymes
6. Plant nutrition

7. Human nutrition
8. Transport in plants
9. Transport in animals

#### CHEMISTRY

1. The particulate nature of matter
2. Experimental techniques
3. Atoms, elements and compounds

4. n/a
5. Electricity and chemistry
6. Chemical energetics
7. Chemical reactions
8. Acids, bases and salts

#### PHYSICS

1. General physics
2. Thermal physics

### Answers

Always read and use the information given in the question. If it seems you don't know how to answer a question re-read the information you have been given and make sure you've understood it. Pick out the key words and take a moment to think about your answer. Ask yourself if what you are writing is what the question is looking for.

For the written paper, make sure you use the syllabus to learn the difference between prompt words. For example, when describing you say what you see, but when you explain you say why.

Look at the number of marks the question is worth, that is how many separate points you should make. If someone can ask you “why” then you’ve not answered in enough detail. Ensure when you are revising, you write all the key words for each topic. It is very easy to lose a mark for explaining by not including a key word. If the question asks you to quote data, then you must do so! Quote pairs of data and the units used in the table or graph you are given. Always show your calculations as there may be marks even if you don’t have the correct final answer.

You need to learn the practicals for each course. Learn them step by step and all the tests from the appendix in each syllabus. Look at mark schemes in any past papers you have to learn what you need to include when drawing a graph. Write to the same number of decimal places that any other data in the question uses. If you are asked how you carry out a practical safely, include one safety feature such as “goggles”, it will give you an easy mark.

## Example questions

### Chemistry

In the Periodic Table, the elements are arranged in columns called Groups and in rows called Periods.

(a) (i) Complete the table for some of the elements in Period 3.

group number	I	II	III	IV	V	VI	VII
symbol	Na	Mg	Al	Si	P	S	Cl
number of valency electrons							
valency							

[2]

(ii) What is the relationship between the group number and the number of valency electrons?

.....

..... [1]

(iii) Explain the relationship between the number of valency electrons and the valency for the elements Na to Al,

.....

.....

.....

for the elements P to Cl

.....

.....

.....

[4]

Fluorine, chlorine, bromine and iodine are halogens.

(a) Complete the table by filling in the blank spaces.

halogen	colour	melting point /°C	boiling point /°C	state at room temperature
fluorine	yellow	-220	-188	
chlorine		-101	-35	gas
bromine	reddish-brown	-7	+59	
iodine		+114		solid

[4]

(b) Predict the boiling point of iodine.

[1]

(c) When chlorine is bubbled through a solution of potassium bromide, the solution turns orange - red.

When iodine is mixed with potassium bromide, no colour change occurs.

(i) Write a word equation for the reaction between chlorine and potassium bromide.

[2]

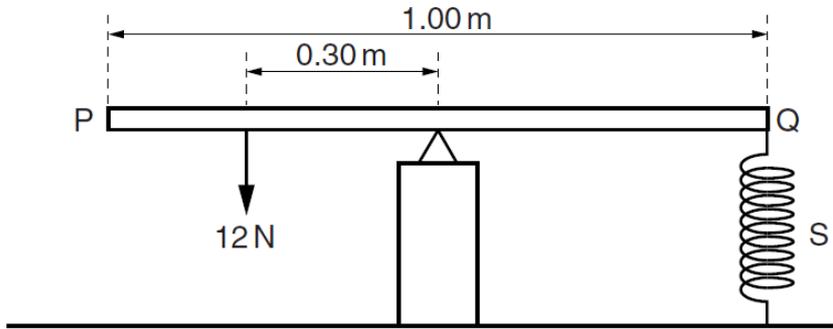
(ii) Put the elements bromine, chlorine and iodine in order of reactivity.

most reactive	→	
least reactive	→	

[1]

**Physics**

Fig. 3.2 shows a uniform rod PQ, supported at its centre and held in a horizontal position. The length of PQ is 1.00 m.



**Fig. 3.2**

A force of 12 N acts at a distance of 0.30 m from the support. A spring S, fixed at its lower end, is attached to the rod at Q.

(i) Calculate the force exerted on PQ by the spring.

force = ..... [2]

(ii) Explain why it is not necessary to know the weight of PQ.

.....  
..... [1]

A group of athletes are training to run a long-distance race. They train using a running machine, known as a Treadmill. An example of an athlete using a treadmill is shown below in figure 2.1.



Fig 2.1

a. Complete the following energy transformation equations for:

i. The Athlete [1]

..... Energy → Kinetic Energy + Thermal Energy

ii. The Treadmill [1]

..... Energy → Kinetic Energy + Thermal Energy

b. The treadmill informs one athlete that they have done 244,000 J (244.0kJ) of Work in running a distance of 5.4 km.

i. Calculate the Average Force exerted by the athlete.[2]

Average Force = .....

ii. If the athlete completed this exercise in 22 minutes 20 seconds, calculate the Average Power output of the Athlete.[2]

Power Output = ..... W

**Biology**

The Ruddy duck, *Oxyura jamaicensis*, is a native of America. A flock of 20 birds was introduced into Britain from America before 1950. The original flock settled quickly in their new habitat and started breeding. Numbers now exceed 6000.

The White-headed duck, *Oxyura leucocephala*, (a native of Spain) is a closely related species to the Ruddy duck.

Female White-headed ducks are more attracted to male Ruddy ducks than to males of their own species.

Cross-breeding between the two species produces a new variety of fertile duck.

The White-headed duck is now threatened with extinction.

Some conservationists are considering a plan to kill the British population of Ruddy ducks to prevent the White-headed duck becoming extinct.

Fig. 6.1 shows a male Ruddy duck.



**Fig. 6.1**

(a) State two features, visible in Fig. 6.1, that distinguish birds, such as the Ruddy duck, from other vertebrate groups.

- 1 ..... [2]
- 2 ..... [2]

(b) (i) With reference to an example from the passage, describe what is meant by the term *binomial system*.

..... [2]

(ii) State two reasons, based on information in the passage, why the Ruddy duck and White-headed duck are considered to be closely related.

- 1 ..... [2]
- 2 ..... [2]

(a) (i) Define *osmosis*.

.....  
.....  
.....  
.....

[3]

(ii) Osmosis is considered by many scientists to be a form of diffusion.

Suggest two ways in which diffusion is different from osmosis.

1. ....

.....

2. ....

.....

[2]