



Junior Cycle Final Examination

Sample Paper F Solutions

# Science

Common Level

Time: 2 hours

360 marks

Examination number

Centre Stamp

**Section A****150 marks****Question 1****15 marks**

(a)

Function	System
Exchanging gases with the air	Respiratory
Producing new offspring	Reproductive
Breaking down food into smaller pieces	Digestive
Transporting substances to all cells in the body	Circulatory

(b) The stomach is an expandable muscular bag that is used to digest food. Enzymes break down the food to make it into smaller molecules that can be absorbed into the blood.

**Question 2****15 marks**

(a) pH 7

(b) The pH of the liquid decreased and became more acidic.

(c) Universal indicator or pH probe

(d) He would observe an increase in pH. The pH would move closer to 7.

**Question 3****15 marks**

(a) 100 km

(b)

Car A	55 minutes
Car B	60 minutes

(c) Car B. The driver stopped for 10 minutes. Car A only stopped for 5 minutes.

(d)  $\text{Speed} = \frac{\text{Distance}}{\text{Time}}$

$$\text{Car A} = \frac{100}{55} = 1.82 \text{ km/min}$$

$$\text{Car B} = \frac{100}{60} = 1.67 \text{ km/min}$$

Driver: Car A

**Question 4****15 marks**

(a) Jupiter and Saturn. One full spin on their axes takes 10 hours so the time between sunrise and sunset is 5 hours.

(b) Mars has similar conditions to Earth, for example, length of day and temperature. Mars has the chemicals, especially water, needed to support human life.

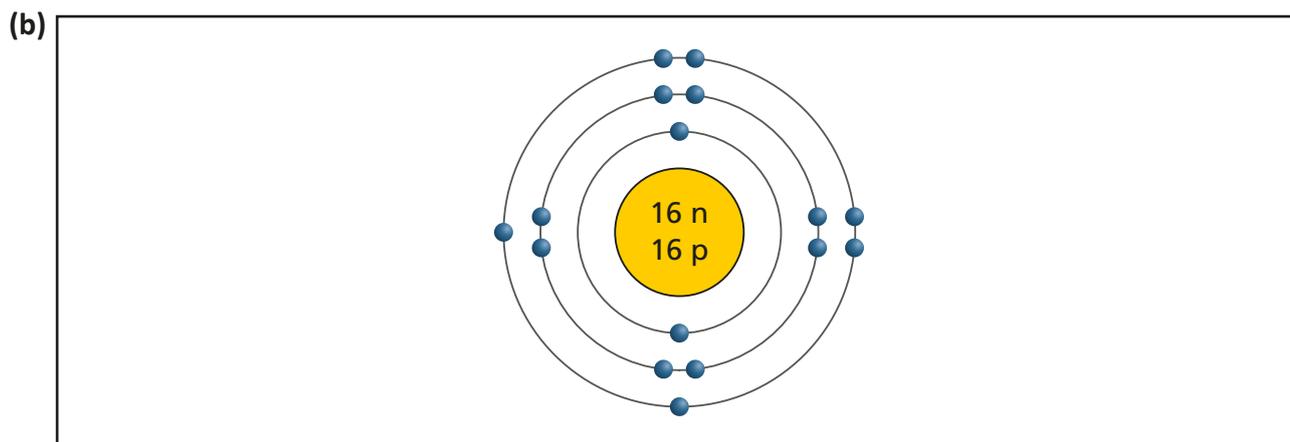
**Question 5****15 marks**

- (a) • Dead leaves – Bacteria – Earthworm – Robin – Sparrowhawk  
 • Maple tree leaves – Cricket – Toad – Fox
- (b) Bacteria and maggots compete for dead leaves.
- (c) A millipede depends on the rotting log for shelter.

**Question 6****15 marks**

(a)

Description	Term
The number of protons in a nucleus	Atomic number
The number of protons and neutrons in a nucleus	Mass number
Positively charged particles in an atom	Protons
The particle in an atom that does not have a charge	Neutrons
The negatively charged particles in an atom	Electrons

**Question 7****15 marks**

- (a) Hot air is less dense than cool air. Therefore, when the candle is lit and heats the air inside the lantern, the hot air causes the lantern to float.
- (b) Platinum, mercury
- (c) Nickel, potassium, sodium

**Question 8****15 marks**

- (a) The geocentric model shows the Moon, Sun and planets rotating around the Earth. The heliocentric model shows the Earth, Moon and planets rotating around the Sun.
- (b) Geocentric
- (c) As technologies advance, we find out more information that fills gaps in our understanding. This is why models change over time.

**Question 9****15 marks**

Description	Example
An element that has a full outer shell	Neon
An element that has 1 electron in its outer shell	Lithium
An element that has 3 electrons in its outer shell	Aluminium
An element that has 7 electrons in its outer shell	Chlorine
A metal	Calcium

**Question 10****15 marks**

- (a) Winter
- (b) Autumn
- (c) The South Pole will experience 24 hours of daylight as it is tilted towards the Sun and does not move out of its rays.
- (d) In summer the tilt of the Earth means that the northern hemisphere spends more time in the Sun's light; hence the days are longer.

## Question 11

30 marks

- (a) The blood is brought to the lungs in arteries. This blood has carbon dioxide waste present in it. This waste is removed when you breathe out. When you breathe in the blood becomes rich in oxygen and it is carried around the body in the circulatory system.
- (b) The models can help explain difficult ideas or things we cannot see. They can show how things or systems work.
- (c) During inhalation the rubber sheet is pulled downwards and the balloons inflate. During exhalation the rubber sheet pushes upwards and the balloons empty. The rubber sheet represents a diaphragm and the balloons represent lungs.
- (d) Stop clock, comfortable clothes for exercising in
- (e) Clear the space so it is safe to exercise in.
- (f) 4 minutes
- (g) Evelyn. She has a lower resting heart rate; her exercise heart rate is lower, and she returns to a resting heart rate sooner than Eithne.

## Question 12

30 marks

- (a) An increase in the number of tourists and greater demand on natural resources, e.g. water, might have been two effects.
- (b) Lower crop yield and a high demand on water
- (c) Pressure is described as the force applied per unit area.
- (d) Water can flow under gravity and a pump is not needed.
- (e)  $\frac{10,000 \text{ N}}{0.8 \text{ m}^3} = 12,500 \text{ N/m}^3$
- (f) Dry, hot, sunny, calm conditions
- (g) Wet and windy conditions

## Question 13

30 marks

- (a) Degrees Celsius and degrees Fahrenheit
- (b) Scientists will know the exact quantity they are dealing with. It is particularly important when scientists are working together.
- (c) The financial newspaper's audience would be businesses and financial institutions. They would be biased in relation to climate change as they would prefer to see the money that is spent on research into climate change spent in ways that would benefit them. They would also like to see taxes reduced in order to be more profitable.
- (d) I think human activities have contributed to global warming. The burning of fossil fuels in factories and homes has meant an increase in the amount of carbon dioxide in the atmosphere. Carbon dioxide is a greenhouse gas. By chopping down forests humans have removed trees that take carbon dioxide out of the atmosphere during photosynthesis. Exhaust fumes from vehicles have also increased the amount of carbon dioxide and other greenhouse gases in the atmosphere.

**Question 14****30 marks**

- (a) carbon dioxide + water + chlorophyll + sunlight = glucose + oxygen
- (b) It is a chemical change as a new product has been formed.
- (c) Colour of the LED
- (d) The volume of oxygen gas produced
- (e) Any two of the following:
- The same type of Canadian Pond Weed
  - The same amount of Canadian Pond Weed
  - The same equipment
  - The same distance from the light source
- (f) They added up the results of the different tests and divided that answer by the total number of tests carried out.
- (g) The red LED was the most accurate, as all of the volumes of oxygen recorded were the same.
- (h) I would select the white LED. It showed little variation in the results and had the second-greatest rate of photosynthesis. This means that the plant will be more likely to grow and create food.

**Question 15****45 marks**

- (a) F
- (b) 9
- (c) 19

(d)

<b>Protons</b>	9
<b>Neutrons</b>	10
<b>Electrons</b>	9

- (e) Poor dental hygiene and a high sugar diet
- (f) Calcium
- (g) Base
- (h) Chewing sugar-free gum will cause the pH in the mouth to increase towards pH 7 and more neutral conditions.