

## Higher Human Biology

### Guide to the exam

The exam lasts 2 and 1/2 hours.

It is worth 100 marks

Make sure you put your FULL NAME on **BOTH** the MULTIPLE CHOICE SHEET and the ANSWER BOOKLET

The exam paper has two sections:

Section 1: 20 multiple choice questions - each worth 1 mark

Section 2: Mixture of short answer questions (worth 1 or 2 marks), problem solving and extended response questions (worth 8-10marks). Total = 80 marks.

### Section 1

Forename(s)			Surname			Seat number								
<input type="text"/>			<input type="text"/>			<input type="text"/>								
Date of birth														
Day			Month			Year			Scottish candidate number					
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
	A	B	C	D										
1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>										
2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>										
3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>										
4	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>										
5	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>										
6	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>										

Answers for Section 1 are recorded on the separate multiple choice sheet.

#### Sample Question

The upper arm bone is called the

- A femur
- B humerus
- C tibia
- D fibula.

The correct answer is **B** - humerus. The answer **B** bubble has been clearly filled in (see below).

A	B	C	D
<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>

#### Changing an answer

If you decide to change your answer, cancel your first answer by putting a cross through it (see below) and fill in the answer you want. The answer below has been changed to **D**.

A	B	C	D
<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>

If you then decide to change back to an answer you have already scored out, put a tick (✓) to the right of the answer you want, as shown below:

A	B	C	D
<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>

 or 

A	B	C	D
<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>

Answers for Section 2 are written on the spaces provided.

Types of question:

1. Knowledge and Understanding

- **"State..."** This requires a concise answer with little supporting argument e.g. state where in the plant cell carbon fixation takes place or a numerical answer that you can obtain through looking at the information, e.g. no calculations involved.
- **"Describe..."** You need to state in words the main points of the topic. The number of marks the question is worth indicates the amount of description required, e.g. if it is worth two marks then you need to make two or three main points.
- **"Explain..."** Give the reasons why something has happened with reference to the theory. Again note the number of marks the question is worth.
- **"Predict..."** Make a logical connection between pieces of information. You don't need to support the answer.
- **"Suggest..."** You are expected to apply your knowledge to a 'novel' situation.
- **"Calculate..."** A numerical answer is required. Don't forget to include the units.

2. Problem Solving

### Presenting information

When asked to take information from a table and present it in the form of a graph you need to decide if it should be a line or a bar graph. If you are not told in the exam follow the rule: if you are given two sets of numbers then make a line graph.

- Use the column headings from the table as the axis labels. Remember to include the units as well.
- The variable that has been altered goes on the x axis and the variable that has been obtained goes on the y axis.
- Pick a suitable scale. The graph should cover at least 50% of the paper and it should start at 0 and increase in equal increments, i.e. each box should be worth the same value.
- On a line graph plot the points using a lightly-drawn X and join them with a ruler. Ensure you don't extend the line before or beyond the first and final points given in the table, e.g. do not plot a 0 value unless it is given in the table.
- Do not use "lines of best fit"
- On a bar graph the bars should be of equal width. If you are plotting two sets of data you should distinguish between them by shading bars and including a key.

There's an extra grid at the end of the paper if you make a mistake.

### Graphs and charts (data interpretation)

Read the x and y axes carefully to:

- check the variables
- note the units used

- calculate the division on the scale

From the graph you should be able to:

- read any value accurately
- calculate an increase
- calculate a decrease
- add up a total
- make predictions
- describe and explain trends

### **Averages**

Generally, this involves adding the values present and then dividing by the number of values. For example, you may be asked to calculate the average transpiration rate (mg/leaf/hr) of a plant from a set of class results.

You may also be asked to calculate average increases or decreases over a set period of time. You must first calculate the increase or decrease and then divide by the length of time. For example, "Calculate the average increase in glucose concentration over a set period of time."

### **Ratios**

Ratio is dealt with in the order that is presented in the question. i.e. Ratio of red birds to black birds to blue birds 3:2:1 means 3 red, 2 black and 1 blue.

For ratios in general, there will be no decimal fractions unless they are in the question.

### **Simplifying ratios**

You simplify a ratio by dividing it by the highest common factor.

### **Percentages (and percentages change)**

Start by representing the calculations as a fraction:

Divide by original  $\times 100 =$  percentage

Difference / original  $\times 100 =$  percentage change

### **3. Experimental design**

You will be asked questions around the design and evaluating an experiment as well as drawing conclusions. The following points will help with this:

- On no account use amount - use **mass, volume, concentration** etc.
- Experiments are repeated and an average calculated to **increase reliability**, not to make it more accurate.

- Only one variable should be altered in an experiment to ensure that it is valid. If asked to identify variables that should be kept constant you need to give ones not already mentioned in the question. They could be temperature, pH, volume of concentration of solutions or mass of a solid.
- Control experiments are set up to ensure that any change in results are due to the variable that is altered. Control experiments have to be identical to the original experiment but minus the altered variable. Suitable controls may be to replace organisms with the same mass or volume of a non-living material, the same mass of a boiled tissue or the same volume of water rather than the given solution.
- When writing a conclusion describe the overall trends in the results. Use the information given on both axes of a graph or columns of a table. If the data shows a change in trend, such as an increase but then a decrease, you need to explain both trends.

Remember the exam is not a race - extra marks are not given for finishing first!

Take your time to read each question carefully - in Biology exams there is often a lot of information to read before you get to the actual questions - read it all carefully before you answer.

Remember to bring:  
 Blue/black pen (and a backup or two)  
 Pencils (for graphs)  
 Eraser  
 Ruler  
 Calculator -

(it is best to bring your own because you are familiar with how it works)

Tissues if you have a cold - you don't want to sniff for 2 hours.

You cannot bring pencil cases - use a clear plastic bag.

Phones must be SWITCHED OFF (not just silenced) and be in your bag at the back of the room or in your locker.

Go to the toilet before the exam - it's a long exam -  
 (but you can go if you need to - raise your hand and asked the invigilator - you will then be escorted to the toilet).

Have a good breakfast - cereal/toast and a drink - exam time is not a time for dieting!