SELF CHECK YOUR ANSWERS

Why it's important

Building this habit will get you an extra couple of marks on each paper you do.

An extra 2-3 marks per paper could be 9+ marks total which can be the difference between grades.

This helps reduce marks thrown away on questions where you do know the content.

Do this really carefully to start with and make a note of how many extra marks you save just by checking your answers.

Method

After you've written each answer.

Read it again and see if you can add more relevant

- Key terms
- Examples
- Data / evidence from the graph or table

Check that you have answered the correct command word(s) and demands of the question.

Check the words you've written are readable and can't be confused with another key term e.g. maltose and maltase or mitosis and meiosis

Calculation Questions

- Before you crunch the numbers what ball park answer are you expecting e.g. an increase or a decrease
- Make a note of any requirements e.g. 2sf or give your answer as a percentage
- Is there a maximum or minimum value? e.g. 100%
- Does your calculated answer match what you were expecting?
- Make sure you include units
- Check you have followed the instructions e.g. 2sf or give your answer as a percentage

Eukaryotic cells produce and release proteins.

Outline the role of **organelles** in the production, transport and release of proteins from eukaryotic cells.

Do **not** include details of transcription and translation in your answer.

[4 marks]

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(c) The student then investigated the effect of pH on the activity of the amylase.

This was the method used,

- Tubes containing starch and amylase were set up in a range of pH buffer solutions.
- The same concentration of starch and amylase were used each time.
- A small sample of the solution was removed and tested for the presence of starch at 20 s intervals.
- The procedure was repeated three times and a mean was calculated for each pH.

The student presented the results in **Table 2.1**.

pH	4	5	6	7	8	9
Mean amylase activity (% of maximum)	27	68	96	100	50	29

Table 2.1

(i) Another student wanted to replicate the investigation.

Refine the method, by giving additional information, so that reproducible results would be obtained.

[3]

(ii) Explain, with reference to bonding, why amylase activity is low at pH 4.

[4]

(iii) The student concluded that the optimum pH for amylase was pH 7.

A teacher made the following statement:

*'The results in **Table 2.1** provide only weak support for the conclusion that the optimum pH for amylase is pH 7.0'*

Evaluate the statement **and** suggest an improvement to the student's procedure that would support the conclusion more strongly.

Evaluation

Improvement

[3]

Scientists investigated the effect of different concentrations of a kinesin inhibitor (KI) on mitosis of human bone-cancer cells grown in a culture.

Table 3 shows the scientists' results.

Table 3

Concentration of kinesin inhibitor / nmol dm^{-3}	**Percentage of dividing human bone-cancer cells showing a monopolar mitotic spindle**
0	0
1	0
10	8
100	93
1000	100
10 000	100

A student who saw these results concluded that in any future trials of this kinesin inhibitor with people, a concentration of 100 nmol dm^{-3} would be most appropriate to use.

Do these data support the student's conclusion? Give reasons for your answer.

[4 marks]

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Eukaryotic cells produce and release proteins.

Outline the role of **organelles** in the production, transport and release of proteins from eukaryotic cells.

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[4 marks]

4 max

1. DNA in nucleus is code (for protein);
2. Ribosomes/rough endoplasmic reticulum produce (protein);
3. Mitochondria produce ATP (for protein synthesis);
4. Golgi apparatus package/modify;
   OR
   Carbohydrate added/glycoprotein produced by Golgi apparatus;
5. Vesicles transport
   OR
   Rough endoplasmic reticulum transports;
6. (Vesicles) fuse with cell(-surface) membrane;

2. and 5. Accept rER for 'rough endoplasmic reticulum'
4. Accept body for 'apparatus'
6. Accept exocytosis at cell membrane

(c) The student then investigated the effect of pH on the activity of the amylase.

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- Tubes containing starch and amylase were set up in a range of pH buffer solutions.
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(i) Another student wanted to replicate the investigation.

Refine the method, by giving additional information, so that reproducible results would be obtained.

three from
specify volume of starch and amylase to be added to the tubes
specify volume (in ml) of the solution that should be removed for testing
stir before taking the sample
test with iodine
all carried out at same temperature

[3]

(ii) Explain, with reference to bonding, why amylase activity is low at pH 4.

four from
ionic / hydrogen, bonds, disrupted / broken
(by) high concentration of, hydrogen ions / H+
tertiary structure / shape of active site, changed
substrate no longer fits into active site
(enzyme) denatured

[4]

(iii) The student concluded that the optimum pH for amylase was pH 7.

A teacher made the following statement:

*'The results in **Table 2.1** provide only weak support for the conclusion that the optimum pH for amylase is pH 7.0'*

Evaluate the statement **and** suggest an improvement to the student's procedure that would support the conclusion more strongly.

Evaluation

Evaluation, two from
idea that optimum could be anywhere between pH 6 and pH 8
only one value between pH 6 and pH 8 tested
idea that shape of data implies optimum less than pH 7

Improvement

Improvement
repeat at more pH values between 6 and 8

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Do these data support the student's conclusion? Give reasons for your answer.

[4 marks]

1. (No, because) at 100 there are still some (7%) cancer cells dividing/undergoing mitosis;
2. So, cancer not destroyed/may continue to grow/spread/form tumours;
3. Best concentration may be between 100 and 1000/need trials between 100 and 1000;
4. This research in culture, don't know effect of KI on people;
5. Yes, because) above 100 produces little increase in % of cells not dividing/undergoing mitosis/at 100, most (93%) cancer cells unable to divide/dead;
6. Above 100 may be harmful (to body);
7. Higher concentrations more expensive;
8. (above 100) will have more effect on (rapidly dividing) cancer cells;

1. Accept idea that all division stops only at 1000
2. Must refer to cancer spreading not cells dividing
4. Reject 'not tested on humans'
4.Reject 'done in animals'
5. Must clearly link lack of monopolar mitotic spindles with cell division
6. Accept 'above 100/high concentrations produce harmful side effects/named effects'
8.Must relate to 100