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Exam Preparation and Free Resources

**Name of the Student**:_____
**Max. Marks : 17 Marks** **Time : 17 Minutes**

Q1.

(a) Describe how the structure of glycogen is related to its function.

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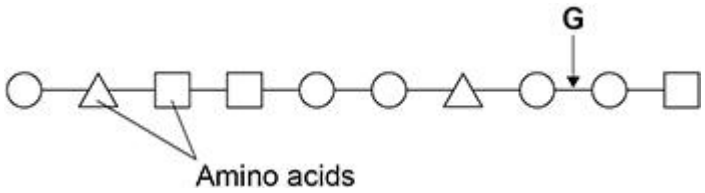
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**(4)**

The diagram shows the primary structure of part of a polypeptide. Each shape represents an amino acid. Identical amino acids have the same shape.




(b) Name the type of peptidase which will hydrolyse the bond labelled **G** in the diagram above.

_____

**(1)**

(c) Give the number of different **R** groups in the polypeptide shown in the diagram above.

_____

**(1)**

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A scientist used an enzyme to digest a polypeptide containing 101 amino acids. The digestion produced a range of smaller polypeptides.

The scientist determined the number of amino acids in each of the polypeptides produced. He also counted the number of polypeptides of each length.

The table below shows some of the scientist's results.

| Number of amino acids in polypeptide | Number of polypeptides of each length |
|---|---|
| 5 | 2 |
| 6 | |
| 15 | 3 |
| 20 | |

(d) Use the information in the table above to calculate the number of polypeptides:

6 amino acids in length _____

20 amino acids in length _____

**(2)**

**(Total 8 marks)**

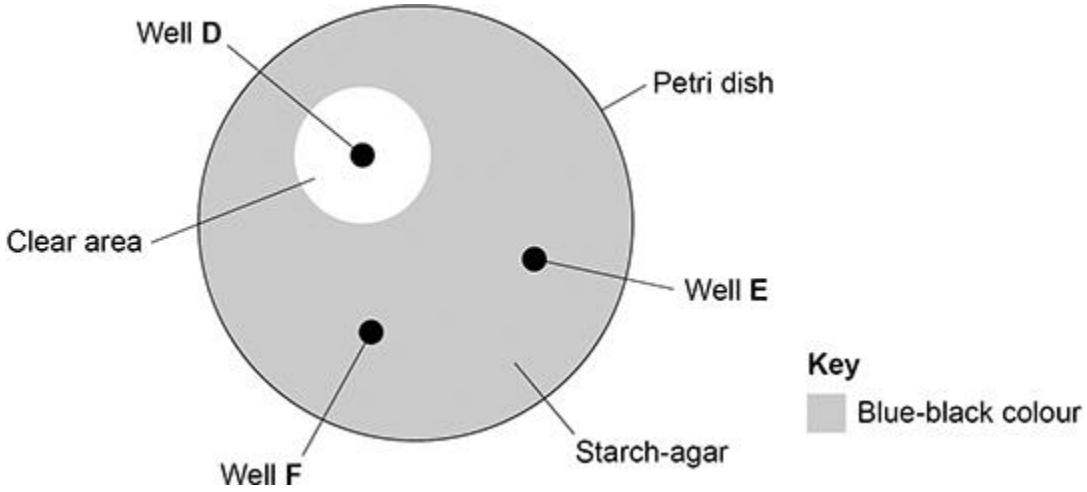
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Q2.

A student investigated the activity of the enzyme amylase. He cut three identical wells (**D**, **E** and **F**) in starch-agar in a Petri dish. He added 0.2 $cm^3$ of:

- amylase solution to well **D**
- boiled amylase solution to well **E**
- water to well **F**.

After 60 minutes, he covered the starch-agar with iodine solution. The figure below shows his results.




(a) Explain the appearance of the agar in the clear area surrounding well **D**.

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**(2)**

(b) What can you conclude about the activity of amylase from the appearance of the agar surrounding well **E** and well **F** in the figure above?

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**(2)**

(c) The student cut out a piece of agar from the clear area surrounding well **D**. He obtained a solution of the substances contained in this piece of agar.

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Describe a different biochemical test the student could use with this solution to confirm that amylase had affected the starch in the clear area surrounding well **D**.

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**(2)**

The diameter of the clear area around well **D** is 18 mm

In a different investigation, the student prepared a dilution of the amylase solution. He did this by mixing amylase solution and water in the volumes shown in the table below.

| **Amylase solution / $cm^3$** | **Water / $cm^3$** |
|---|---|
| 1.6 | 2.4 |

He prepared a starch-agar Petri dish identical to the figure above, but with a single well. He added 0.2 $cm^3$ of the diluted amylase solution to this well and left the Petri dish for 60 minutes.

(d) Use all of this information to predict the diameter of the clear area that will form around the well containing the diluted amylase solution.

Give your answer to the nearest whole number.

Show your working.

Answer _____ mm

**(2)**

(e) The student used a ruler to measure the diameter in mm of the clear area around well **D** in the figure above.

Use this information to explain why the answer to part (d) should be given to the nearest whole number.

_____

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**(1)**

**(Total 9 marks)**

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