

**GCSE Biology A (Gateway)**

**J247/03** Paper 3 Biology (Higher Tier)

**Question Set 21**

Multiple Choice Questions

B1: Cell Level Systems

1.

In DNA, which base does T (thymine) pair with?

- A A
- B C
- C G
- D T

Your answer

A

[1]

2

Which molecule is **not** a polymer?

- A DNA
- B Lipid
- C Protein
- D Starch

Your answer

B

[1]

3

Insulin is a protein made of 51 amino acids.

How many bases are in the length of DNA coding for insulin?

- A 51
- B 102
- C 153
- D 204

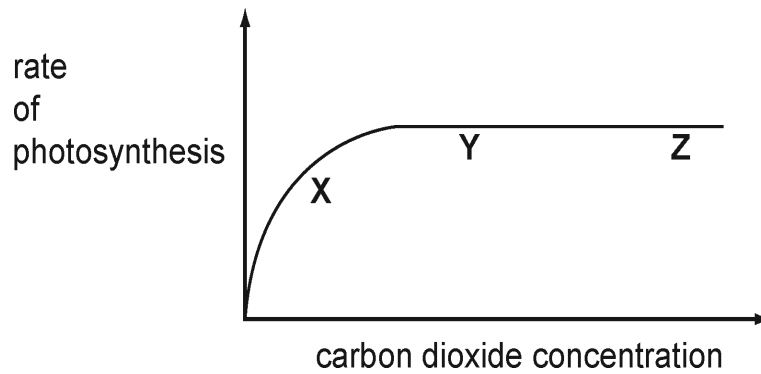
Your answer

C

[1]

4

The graph shows the effect of carbon dioxide concentration on the rate of photosynthesis.



Where on the graph is carbon dioxide a limiting factor?

- A X only
- B X and Y
- C Y and Z
- D Z only

Your answer

A

[1]

5

Which does **not** contain DNA?

- A Cell membrane
- B Chromosome
- C Nucleus
- D Plasmid

Your answer

A

[1]

6

The inverse square law in relation to light intensity ( $i$ ) and distance ( $d$ ) from the light source is shown by:

- A  $i \propto d^2$
- B  $i \propto 1/d^2$
- C  $i^2 \propto 1/d$
- D  $i^2 \propto d$

Your answer

B

[1]

7

The diameter of a human egg cell is 120  $\mu\text{m}$ . What is the diameter in mm?

(1  $\mu\text{m}$  =  $1 \times 10^{-3}$  mm.)

- A  $1.2 \times 10^{-1}$
- B  $1.2 \times 10^{-2}$
- C  $1.2 \times 10^{-3}$
- D  $1.2 \times 10^{-4}$

Your answer

A

8

During protein synthesis the DNA that codes for a particular protein is copied. This copy is called mRNA.

The diagram below shows the base sequence for a section of DNA.

**G G T G C A T A T**

What would be the complementary sequence of mRNA for this section of DNA?

- A C C A C G T A T A
- B C C A C G U A U A
- C G G T G C A T A T
- D G G U G C A U A U

Your answer

B

9

Which of these structures is found in eukaryotic but **not** prokaryotic cells?

- A Cell wall
- B Cytoplasm
- C Nucleus
- D Plasmid

Your answer

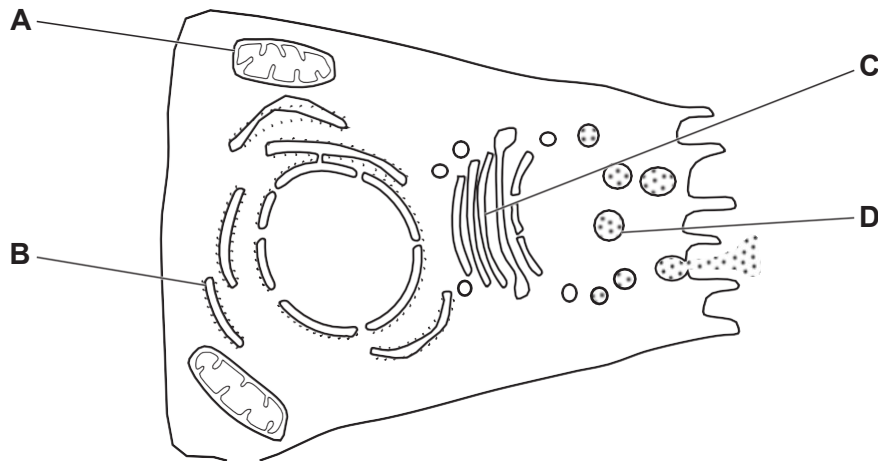
C

[1]

[1]

10

This is a cell.



Where does cellular respiration occur?

Your answer

A

11

A light source is placed 0.5 m from a plant. The relative light intensity falling on the plant is 2 units.

[1]

The light source is moved to 1 m away.

What is the relative light intensity falling on the plant now?

A 0.125

$$i \propto \frac{1}{d^2}$$

B 0.25

$$2 \propto \frac{1}{0.5^2}, 2 = \frac{k}{0.5^2}, 2 = 4k, k = 0.5$$

C 0.5

$$i = \frac{0.5}{1^2} = \underline{\underline{0.5}}$$

D 1.0

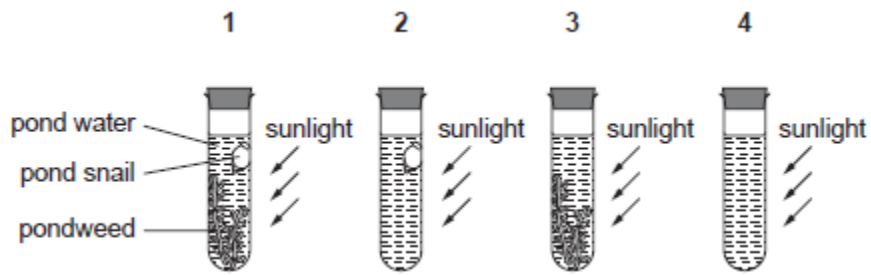
Your answer

C

[1]

12

Pond snails and pondweed are living in water in sealed test tubes.



Carbon dioxide dissolves in water and forms an acid.

In which test tube would the water become most acidic?

- A 1
- B 2
- C 3
- D 4

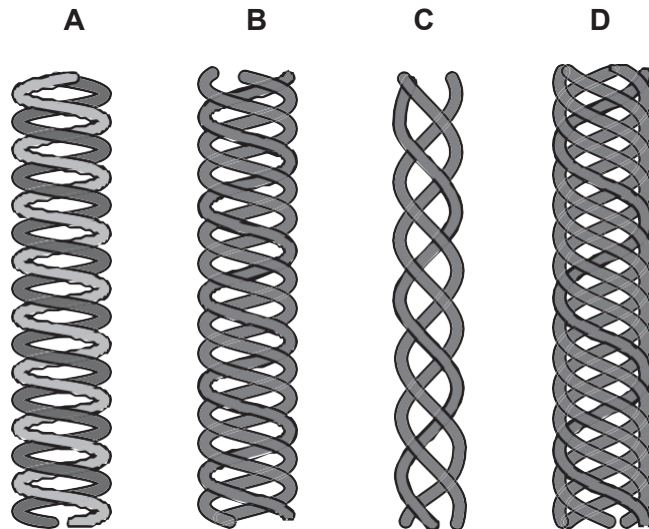
[1]

Your answer

**B**

13

Which structure most closely resembles DNA?



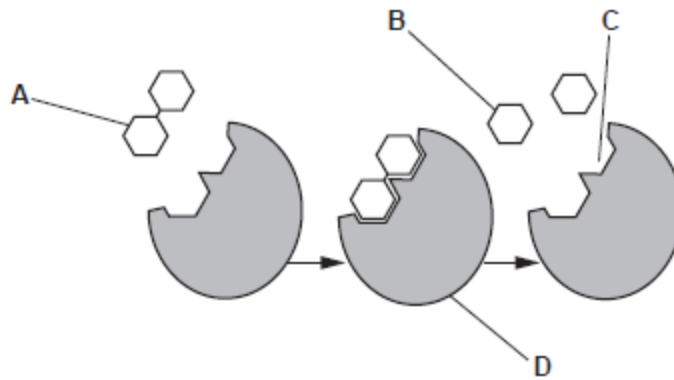
Your answer

**A**

[1]

14

Look at the model of enzyme activity.



Which label represents the active site of an enzyme?

[1]

Your answer

C

15

Which biological molecule is **not** a polymer?

A Amylase

B DNA

C Nucleotide

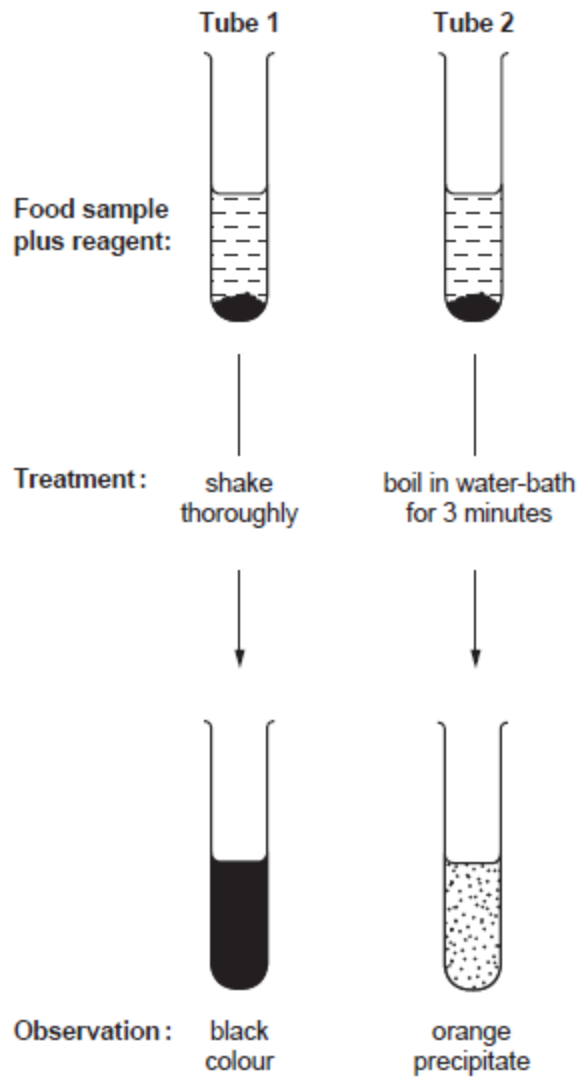
D Starch

Your answer

C

[1]

The diagram shows positive results in two different food tests.



What do the results show in each tube?

	Tube 1	Tube 2
A	sugar	lipid
B	starch	sugar
C	protein	sugar
D	starch	protein

[1]

Your answer

**B**



17

Aerobic respiration occurs all the time in plant cells but photosynthesis only occurs in daylight.

Why is more energy released by a plant cell during the night?

- A Photosynthesis is endothermic taking in energy and aerobic respiration is exothermic.
- B Photosynthesis is exothermic taking in energy and aerobic respiration is endothermic.
- C Aerobic respiration is exothermic taking in energy and photosynthesis is endothermic.
- D Aerobic respiration is endothermic taking in energy and photosynthesis is exothermic.

[1]

Your answer

A

18

A cell structure measures 1 micrometre in diameter.

What is the diameter of the cell structure in metres?

- A  $1 \times 10^{-3}$  metres
- B  $1 \times 10^{-6}$  metres
- C  $1 \times 10^{-9}$  metres
- D  $1 \times 10^{-12}$  metres

Your answer

B

[1]

19

A human cell has 10000 mitochondria and a yeast cell has 10.

By how many orders of magnitude are there more mitochondria in a human cell than in a yeast cell?

- A 2
- B 3
- C 10
- D 1000

Your answer

B

[1]

**Total Marks for Question Set 1: 19**

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