

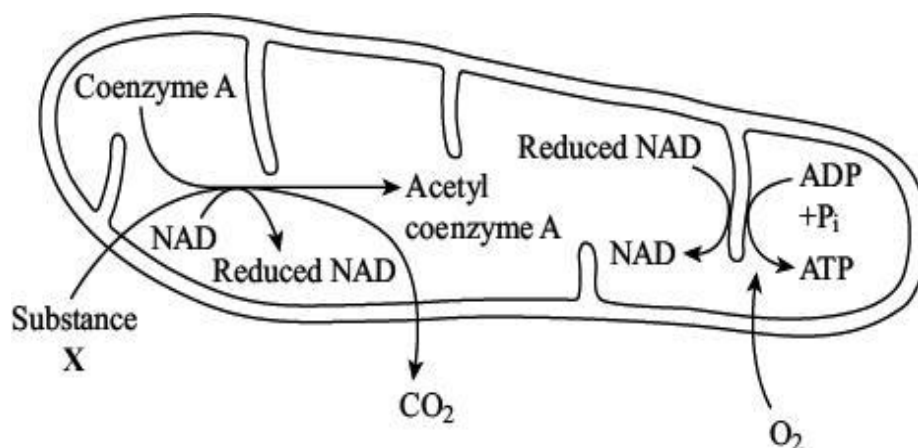
Name of the Student: _____

Max. Marks : 20 Marks

Time : 20 Minutes

Q1.

The diagram represents two of the stages of aerobic respiration that take place in a mitochondrion.



(a) Name substance X.

(1)

(b) Which stage of aerobic respiration takes place inside a mitochondrion and is **not** represented on the diagram?

(1)

(c) Explain why oxygen is needed for the production of ATP on the cristae of the mitochondrion.

(3)

(Total 5 marks)

Q2.

When fertilisers are applied to fields next to a lake, nitrogen-containing substances from the fertilisers get into the lake.

- (a) (i) Describe how the nitrogen-containing substances get into the lake.

(1)

- (ii) It takes longer for the nitrogen-containing substances to get into the lake when an organic fertiliser is used than when an inorganic fertiliser is used. Explain why it takes longer when an organic fertiliser is used.

(2)

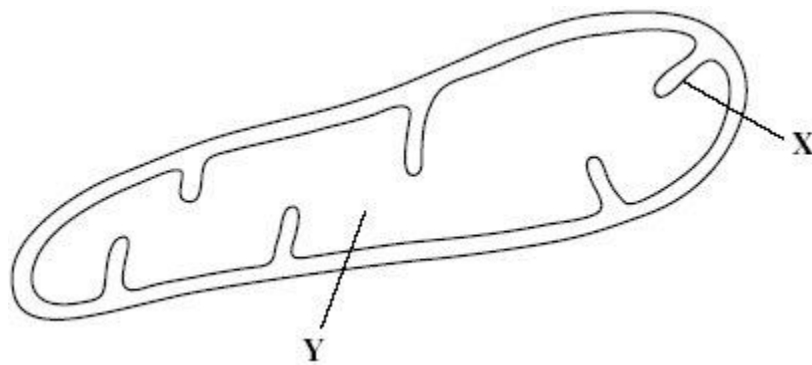
- (b) Describe how the presence of nitrates in a lake may eventually lead to the death of fish.

(4)

(Total 7 marks)

Q3.

The diagram shows a mitochondrion.



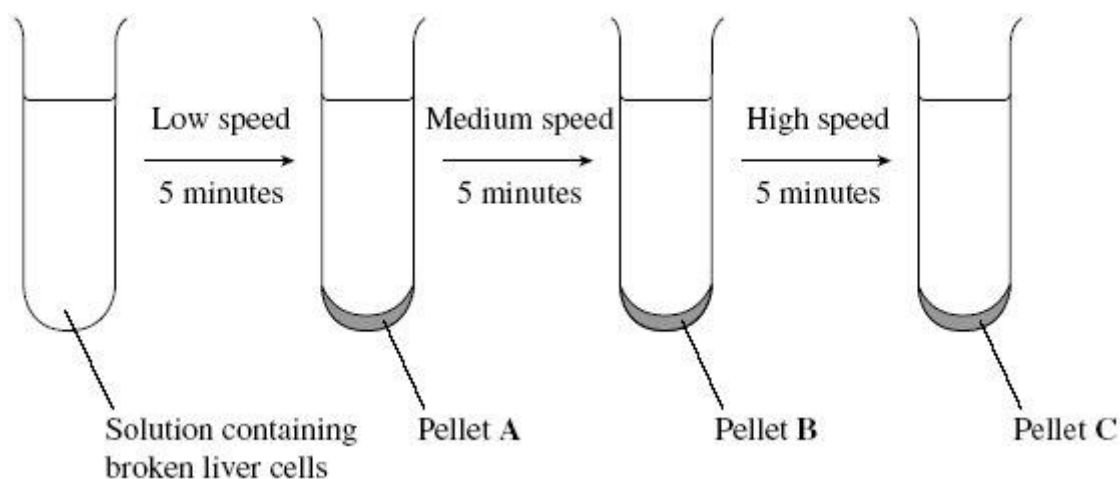
(a) Name the parts labelled **X** and **Y**.

(i) **X** _____

(ii) **Y** _____

(2)

Scientists isolated mitochondria from liver cells. They broke the cells open in an ice-cold, isotonic solution. They then used a centrifuge to separate the cell organelles. The diagram shows some of the steps in the process of centrifugation.



(b) Suggest which pellet, **A**, **B** or **C** contained the mitochondria.



(1)

(c) Explain why the solution used was

(i) ice-cold

(1)

(ii) isotonic.

(2)

- (d) People with mitochondrial disease have mitochondria that do not function properly.

Some people with mitochondrial disease can only exercise for a short time. Explain why a person with mitochondrial disease can only exercise for a short time.

(2)

(Total 8 marks)