

# THE CYCLING OF MATTER THROUGH THE BIOSPHERE

## TOPIC TEST – 1

### QUESTION 1

Which of the following processes WILL NOT release carbon dioxide into the atmosphere?

- A Cellular respiration
- B Microbial decay
- C Photosynthesis
- D Combustion

### QUESTION 2

Plants can be considered as “food factories” because:

- A They only manufacture carbohydrates.
- B They use the products of photosynthesis to produce other compounds such as lipids and proteins.
- C They absorb nitrogen from the air to produce proteins.
- D They produce gaseous nitrogen and release it into the atmosphere.

### QUESTION 3

Fertilizers are used in soils that are naturally deficient in nitrogen containing compounds. Which of the following shows the formula of a fertilizer that would be best suited for this purpose.

- A  $\text{Cu}_3(\text{PO}_4)_2$
- B  $\text{N}_2$
- C  $\text{NH}_4\text{NO}_3$
- D  $\text{HNO}_3$  (concentrated)

### QUESTION 4

A summary of the conversions that occur when gaseous nitrogen is recycled back into the atmosphere is:

- A  $\text{NO}_3^- (\text{aq}) \rightarrow \text{N}_2\text{O} (\text{g}) \rightarrow \text{N}_2 (\text{g})$
- B  $\text{N}_2 (\text{g}) \rightarrow \text{N}_2\text{O} (\text{g}) \rightarrow \text{NO}_3^- (\text{aq})$
- C  $\text{N}_2 (\text{g}) \rightarrow \text{NH}_3 (\text{g}) \rightarrow \text{NH}_4^+ (\text{aq})$
- D  $\text{NH}_4^+ (\text{aq}) \rightarrow \text{NO}_2^- (\text{aq}) \rightarrow \text{NO}_3^- (\text{aq})$

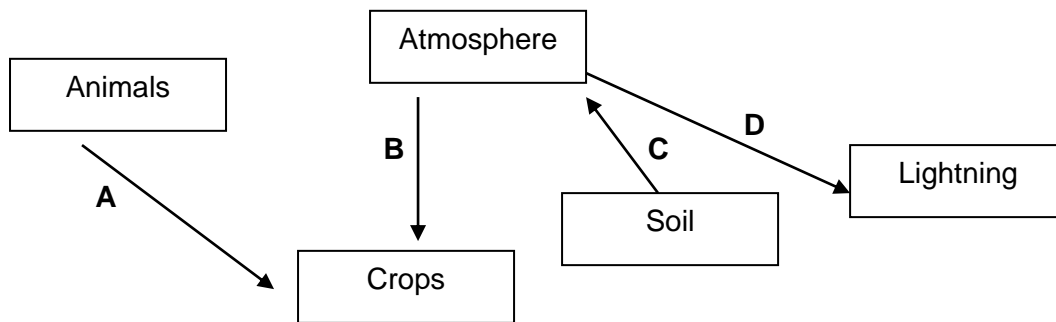
### QUESTION 5

Which of the following will not cause nitrogen fixation?

- A Releasing urea into soil.
- B Nitrifying bacteria in the soil.
- C Driving a car to school.
- D Lightning.

### QUESTION 6

An outline of part of the nitrogen cycle is shown below:



- (a) What does the term nitrogen “fixation” mean?
- (b) Which process/processes (A, B, C or D) involve nitrogen fixation?
- (c) Which process/processes (A, B, C or D) involve the action of denitrifying bacteria?

### QUESTION 7

Why are artificial fertilisers such as ammonium nitrate more popular among farmers than a natural fertiliser such as animal manure?

### QUESTION 8

Explain why a rainforest grows and flourishes with out human interference but a field of crops requires close attention from a skilled farmer?

## SOLUTIONS

**QUESTION 1** Answer is C

**QUESTION 2** Answer is B

**QUESTION 3** Answer is C

**QUESTION 4** Answer is A

**QUESTION 5** Answer is A

**QUESTION 6**

- (a) Nitrogen fixation is when nitrogen reacts with other elements to produce compounds.
- (b) B and D
- (c) Answer is C

**QUESTION 7**

Artificial fertilisers are easier to obtain than animal manure, easier to handle, don't have the same unpleasant smell and have a higher proportion of useful nitrogen containing compounds.

**Question 8**

Unlike a field of crops, a rainforest is a very dynamic environment with a diverse range of plants and animals. Animal wastes and the decomposing remains of animals and plants are constantly accumulating on the forest floor, providing a rich source of nitrogen for the vegetation making up the rainforest.