Relationships of organisms with one another and with the environment – 2020 O Level 5090

1. Nov/2020/Paper_11/No.28

Which statement describes relationships in ecosystems?

A Carbohydrates are passed from decomposers to producers.

B Energy is passed from carnivores to herbivores.

C Proteins are passed from primary consumers to producers.

D Carbohydrates are passed from producers to herbivores.

2. Nov/2020/Paper_11/No.29

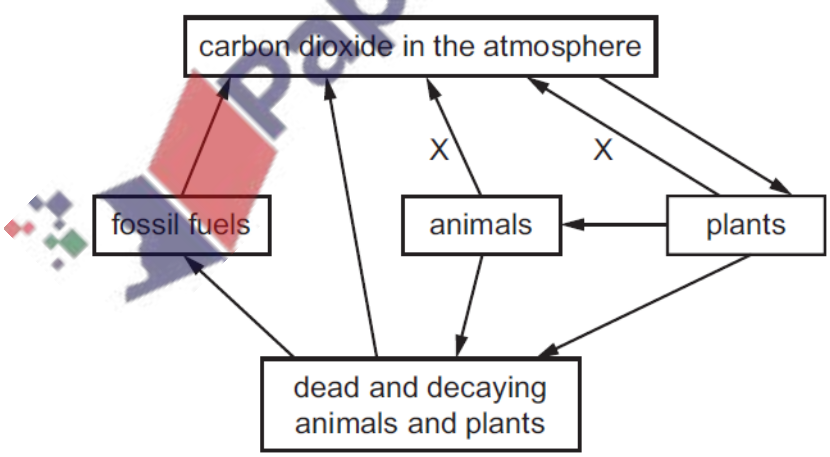
Mealybugs are small insects that can feed on crops such as mango and coffee. They damage the crops and reduce the yield and profits for farmers. Lacewing insects and ladybird beetles both eat mealybugs.

Which row shows the positions of some of the organisms in this food chain?

	producer	herbivore	carnivore
A	lacewing	mealybug	coffee
B	coffee	mealybug	lacewing
C	mealybug	ladybird	mango
D	mango	ladybird	mealybug

3. Nov/2020/Paper_11/No.30

The diagram shows the carbon cycle.



What is process X?

A burning

B decomposition

C photosynthesis

D respiration

4. Nov/2020/Paper_11/No.32

What would be an **undesirable** feature in an insecticide?

A It becomes more concentrated at each stage in the food web.

B It breaks down within a few months.

C It destroys one particular insect only.

D It destroys the immature forms of an insect.

5. Nov/2020/Paper_12/No.28

Which statement describes relationships in ecosystems?

A Carbohydrates are passed from decomposers to producers.

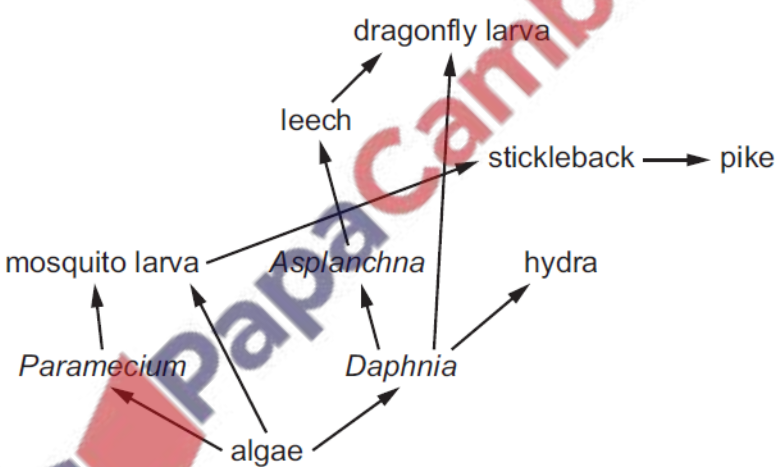
B Energy is passed from carnivores to herbivores.

C Proteins are passed from primary consumers to producers.

D Carbohydrates are passed from producers to herbivores.

6. Nov/2020/Paper_12/No.29

The diagram shows a food web of organisms found in a pond.



Which organism is both a herbivore and a carnivore?

A algae

B dragonfly larva

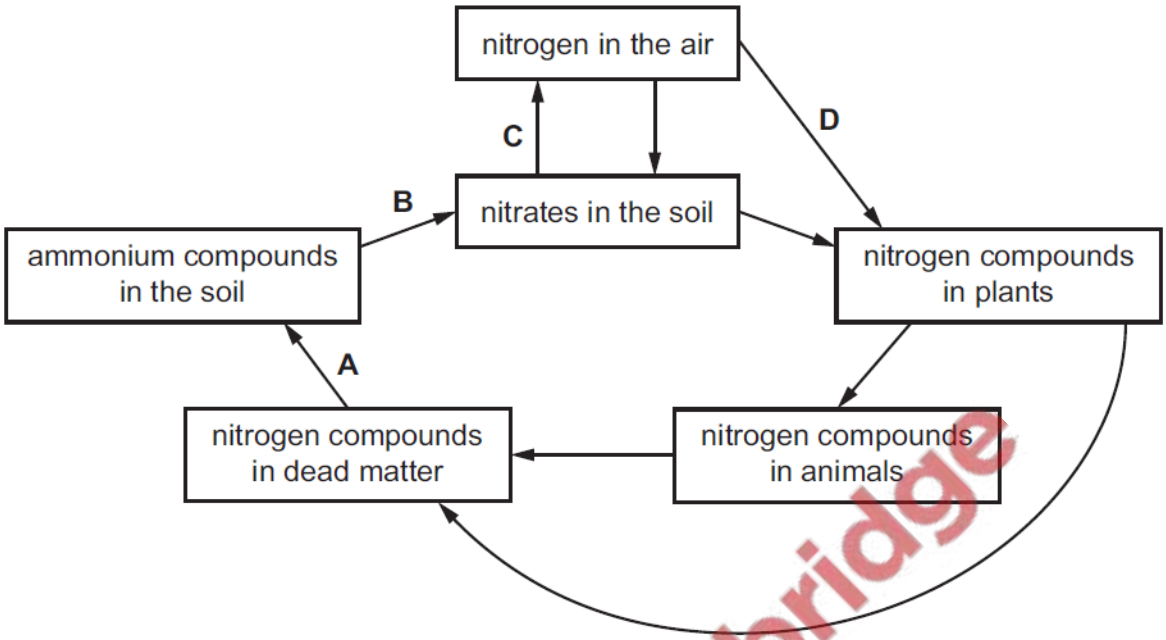
C mosquito larva

D *Paramecium*

7. Nov/2020/Paper_12/No.30

The diagram shows the nitrogen cycle.

Which stage is carried out by nitrifying bacteria?



8. Nov/2020/Paper_12/No.32

What would be an **undesirable** feature in an insecticide?

A It becomes more concentrated at each stage in the food web.

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C It destroys one particular insect only.

D It destroys the immature forms of an insect.

9. Nov/2020/Paper_21/No.2

Corals are a collection of small animals living together in the sea. Their skeletons produce coral reefs. The cells of these animals contain microscopic, green, plant-like organisms called algae.

(a) Suggest the name of the process by which the algae make their food and explain your answer.

process .....

explanation .....

..... [2]

(b) The corals and the algae depend on each other to survive.

Suggest

- how the algae benefit from the corals

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- how the corals benefit from the algae.

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[5]

(c) An increase in the average temperature of the sea over the last 20 years has caused the algae to manufacture chemicals that are poisonous to the corals.

Suggest and explain the long-term effect on the corals and on the algae of this rise in temperature.

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..... [3]

[Total: 10]

10. Jun/2020/Paper_11/No.28

The flow of energy in ecosystems is non-cyclical.

What is the main reason for this?

A Energy can be transferred back to its original source.

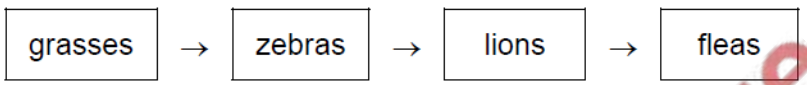
B Energy is not transferred from living things to their environment.

C Energy is only transferred from smaller to larger organisms.

D Energy is transferred from living organisms as heat.

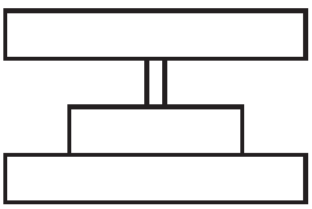
11. Jun/2020/Paper_11/No.29

The diagram shows a food chain.

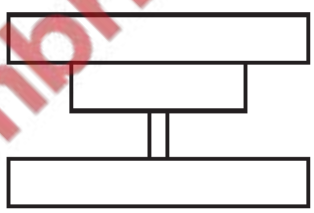


Which pyramid of numbers would represent this food chain?

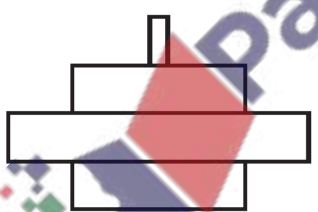
A



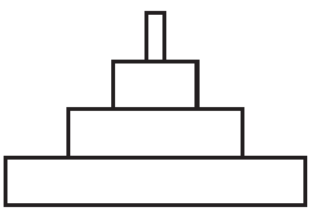
B



C



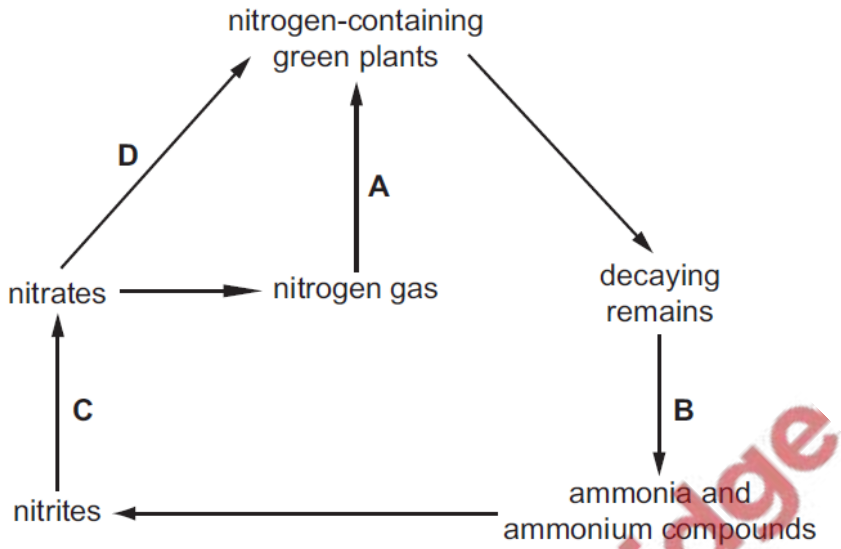
D



12. Jun/2020/Paper_11/No.30

The diagram shows parts of the nitrogen cycle.

Which arrow represents the action of the root nodule bacteria of leguminous plants?



13. Jun/2020/Paper_11/No.32

Areas of tropical rainforests are often cut down and cleared. After cutting down the trees, the areas are normally burnt.

What are the effects of this activity?

	atmospheric carbon dioxide	number and variety of species	soil stability
A	decreases	decreases	increases
B	decreases	increases	decreases
C	increases	decreases	decreases
D	increases	decreases	increases

14. Jun/2020/Paper_12/No.28

The diagram shows a food chain.

aquatic plant → tadpole → small fish → bird

Which group of organisms is missing from this food chain?

A carnivores

B decomposers

C herbivores

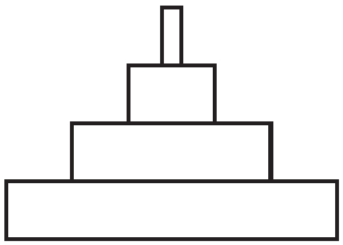
D producers

15. Jun/2020/Paper_12/No.29

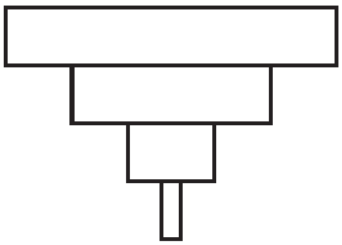
Insects feed on a tree's leaves. The insects are eaten by small birds that are the prey of larger birds.

Which pyramid of numbers illustrates this food chain?

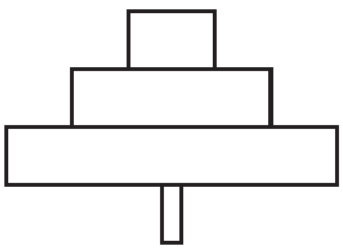
A



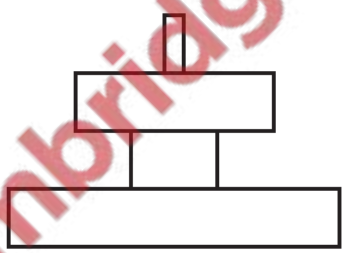
B



C



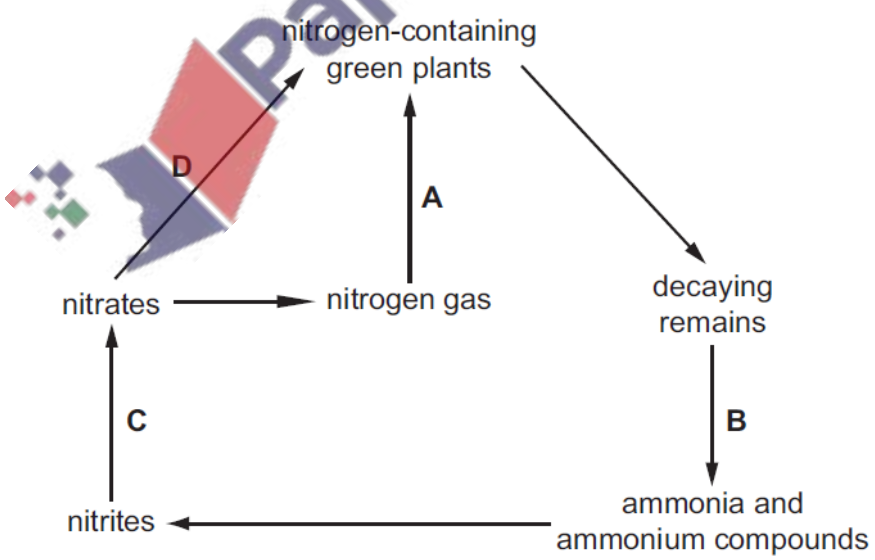
D



16. Jun/2020/Paper_12/No.30

The diagram shows parts of the nitrogen cycle.

Which arrow represents the action of the root nodule bacteria of leguminous plants?



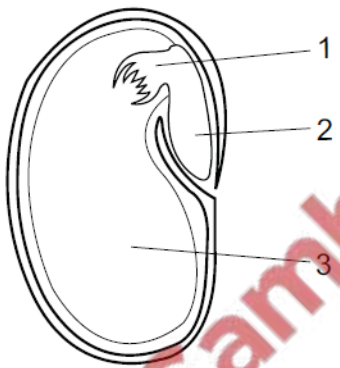
17. Jun/2020/Paper_12/No.32

Which pollutants may be released by agricultural practices?

	pollutant			
	insecticides	methane	fertiliser	sulfur dioxide
A	yes	yes	yes	no
B	yes	yes	no	yes
C	yes	no	yes	yes
D	no	yes	yes	yes

18. Jun/2020/Paper_12/No.33

The diagram shows a section of a seed.



What are the numbered parts?

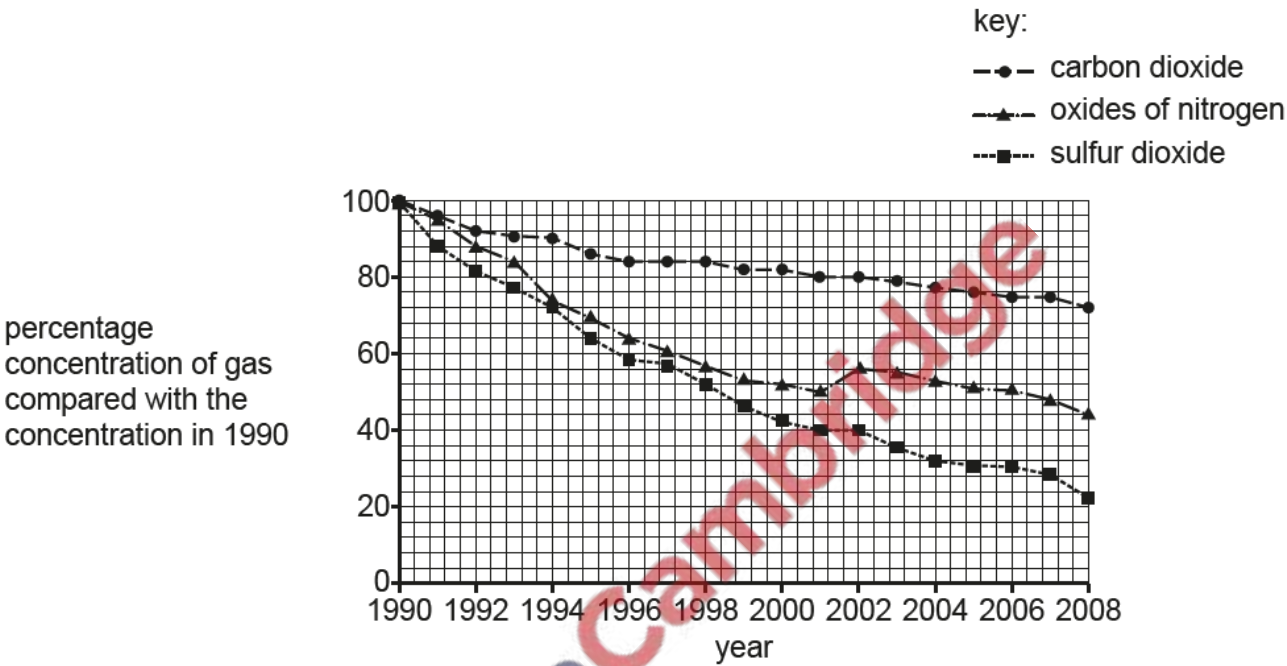
	1	2	3
A	cotyledon	plumule	radicle
B	plumule	cotyledon	radicle
C	plumule	radicle	cotyledon
D	radicle	plumule	cotyledon

19. Jun/2020/Paper_22/No.2

The pollution of air and water may result from human activity. This pollution can lead to many harmful effects on ecosystems. A knowledge of these harmful effects has led to a reduction in human activity that leads to this pollution.

(a) One human activity that may lead to pollution of air is the production of electricity.

The graph shows changes in the release of gases into the air during the production of electricity over a period of 18 years by 32 countries.



(i) Describe, using data from the graph, the trends shown.

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(ii) During this period of 18 years, the total amount of electricity produced each year by the 32 countries increased.

Suggest **one** change in the processes used by these countries to produce electricity that may account for the trends shown in the graph.

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..... [1]

(iii) Pollution of the air by each of the gases named in the graph leads to harmful effects on ecosystems.

Suggest **and** explain the **positive** effects on ecosystems of the trends shown in the graph.

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(b) A survey of the populations of several species of fish in part of a river was carried out in 2003 and again in 2007.

(i) The population of one species of fish decreased from 1385 to 28 over this period.

Calculate the percentage decrease in the population of this species of fish.

..... % [1]

(ii) The scientists who carried out the surveys suggested that the fish population might recover if conservation actions are taken.

Suggest **one** possible conservation action that could be recommended by the scientists **and** describe how they could find out whether this action is successful.

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[Total: 12]

20. Jun/2020/Paper_22/No.9

The nitrogen cycle makes nitrogen available for the production of proteins in plants. These plants may then be eaten by humans and the proteins digested.

(a) Outline the roles of bacteria in the nitrogen cycle.

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(b) Describe the digestion of proteins in **one named** organ of the alimentary canal.

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[Total: 10]