

PART A: MULTIPLE CHOICE (10 MARKS)

Choose the best response in each case and place your answer in the appropriate space on your answer sheet.

- Which of the following compounds is not organic?
(a) water (b) fat
(c) sugar (d) protein
- Atoms of carbon are:
(a) constantly being created.
(b) constantly being destroyed.
(c) continuously recycled.
(d) transported to Earth by the sun's rays.
- When Joseph Priestley placed a growing plant and a live mouse inside a sealed bell jar:
(a) the plant and mouse both died in a few minutes.
(b) the mouse in the jar with the plant died more quickly than a mouse sealed in a jar without a plant.
(c) the mouse in the jar with the plant lived longer than a mouse sealed in a jar without a plant.
(d) the mouse lived until it ran out of food after eating the entire plant.
- The results of the experiments with Biosphere 2 proved self-sustaining ecosystems:
(a) cannot be set up.
(b) are more complex than originally thought.
(c) still require an external supply of oxygen.
(d) are much simpler than originally thought.
- The practice of growing monocultures of plants is:
(a) the best way of achieving a sustainable ecosystem.
(b) the best way to maintain a sustainable balance of nutrients without adding fertilizers.
(c) a threat to sustainability because a single disease or pest could wipe out an entire crop.
(d) a threat to sustainability because it is too expensive.
- Which of the following is not considered to be a reservoir for inorganic carbon?
(a) trees (b) Earth's crust
(c) oceans (d) the atmosphere
- Before nitrogen can be used by living organisms, it must be converted to water-soluble:
(a) ammonia. (b) nitrates.
(c) nitrites. (d) nitrogenous wastes.
- Modern water-soluble pesticides have less effect on top predators because:
(a) they act more quickly.
(b) they last longer.
(c) they accumulate only in the bodies of the pests for which they are intended.
(d) they do not accumulate in the bodies of the top predators.
- After DDT had been used for a period of time:
(a) all of the pests it was used on were killed.
(b) it began to accumulate in the bodies of top carnivores.
(c) it had no negative effects because it broke down immediately after use.
(d) it had no more effects, either positive or negative.
- Organic pollutants, such as algae, use the most oxygen when they:
(a) carry on respiration.
(b) carry on photosynthesis.
(c) first die.
(d) decompose.

PART B: MATCH (5 MARKS)

Match the definition from the 1st column to the best term in the 2nd column and place the matching letter in the appropriate space on your answer sheet.

- Compounds that contain atoms of both carbon and hydrogen.
 - One of the products of photosynthesis.
 - Process by which energy is created by combining sugar with oxygen to produce carbon dioxide and water.
 - Organism that people consider harmful or a nuisance.
 - Process in which atmospheric nitrogen is converted into nitrate ions.
- cellular respiration
 - denitrification
 - glucose
 - inorganic compound
 - nitrogen fixation
 - nutrient
 - organic compound
 - pest
 - pesticide
 - photosynthesis

PART A: MULTIPLE CHOICE (10 MARKS)

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|----|

PART B: MATCH (5 MARKS)

| | | | | |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|

PART C: SHORT ANSWER (27 MARKS)

Answer questions 1 to 5 in the space provided. Answer question 6 on the back of this sheet.

- {4} 1. Indicate whether each of the ecosystems below can be sustained. A check mark (✓) indicates whether (A) utotrophs, (H)eterotrophs, or (D)ecomposers are present.

| A | H | D | Yes/No |
|---|---|---|--------|
| | ✓ | | |
| ✓ | ✓ | ✓ | |
| | ✓ | ✓ | |
| ✓ | ✓ | | |

- {12} 2. Use the table below to compare photosynthesis with respiration. For items indicated with a question mark (?) answer with a yes or no.

| Comparison | Photosynthesis | Respiration |
|---------------------|----------------|-------------|
| raw materials | | |
| products | | |
| occurs in plants? | | |
| occurs in animals? | | |
| energy is released? | | |
| energy is needed? | | |

- {2} 3. What happens to the amount of a nutrient as it passes through the biosphere? Why does the biosphere not run out of nutrients?

- {3} 4. List three ways that nitrogen gas is converted to nitrates?

① _____

② _____

③ _____

- ~~{3}~~ List three uses of phosphorus that are important to living things?

① _____

② _____

③ _____

6. The insecticide DDT was used in amounts not considered harmful in Clear Lake, California to control gnats. Examine the chart to the right and answer the following questions.

- {1} (a) Even though the concentration of DDT added to the water was very low, describe what happened as it entered the various organisms in the food chain.
- {3} (b) Explain how the grebe could have such a high concentration of DDT in its body.
- {2} (c) In your opinion is there any concentration of DDT that would be safe to use in the lake? Explain your answer.

| Location of DDT | Concentration (ppm) |
|--------------------------|---------------------|
| water | 0.02 |
| plankton | 5.3 |
| small fish | 10 |
| predator fish (gar pike) | 1500 |
| predator bird (grebe) | 1600 |