

## JOSEPH BANKS SECONDARY COLLEGE

### Assessment 2 - Test

**Integrated Science: General – Earth systems/cycles in nature and structure and function of biological systems**

**Date:** Term 1 Week 9

**Weighting:** 5%

**Time allowed for this paper:**

Reading Time: 5 minutes

Working Time: 50 minutes

**Materials required/recommended for this paper:**

*To be provided by the supervisor*

This question/answer booklet

*To be provided by the candidate*

Standard items: pen, pencil, sharpener, correction fluid, eraser and highlighters.

#### Structure of this paper

	Section	Number of Questions	Marks Available
<b>A</b>	<b>Multiple Choice</b>	<b>10</b>	<b>/10</b>
<b>B</b>	<b>Short Answer</b>	<b>6</b>	<b>/44</b>
	<b>Total</b>		<b>/54</b>

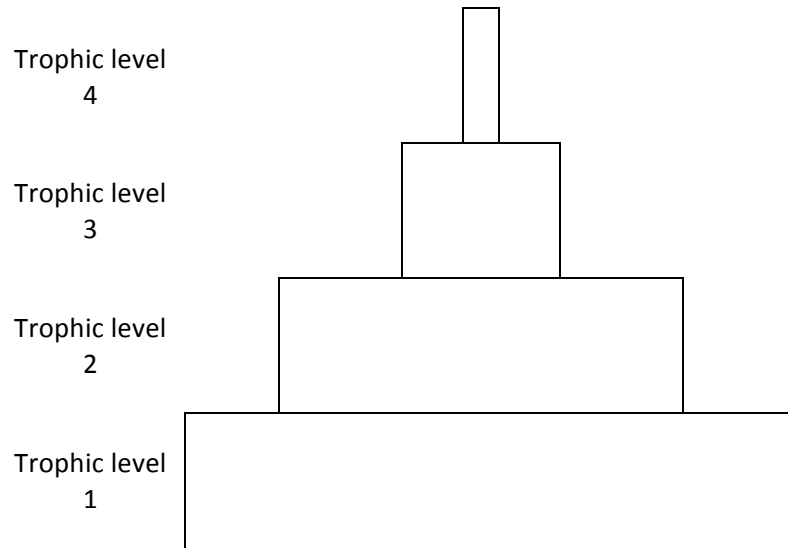
**Part A: Multiple-choice**

**(10 marks)**

This section has **10** questions. Circle the correct answer.

1. The long-tailed mouse eats fungi, insects, spiders and fruits and is, therefore
  - (a) an autotroph.
  - (b) a detritivore.
  - (c) a herbivore.
  - (d) an omnivore.
  
2. Which of the following is an example of predation?
  - (a) A flea sucks the blood of a dog.
  - (b) A spider traps and eats a fly.
  - (c) A sea anemone hitchhikes on the shell of a crab.
  - (d) A lion kills a leopard in a fight.
  
3. An aquarium containing plants and invertebrates is completely sealed so that no organisms, gases or other matter can enter or leave. It is placed so that it receives six to eight hours of sunlight daily. After three months, living plants and invertebrates are still present in the aquarium. Which of these statements about the aquarium is correct?
  - (a) No energy has entered or left the aquarium.
  - (b) The total amount of carbon in the aquarium is reduced.
  - (c) The invertebrates in the aquarium cannot be competing.
  - (d) Some of the energy in the plants has moved to the invertebrates.

4. Use the pyramid of biomass below to answer the question that follows.



Approximately what proportion of the energy fixed in the bodies of primary producers in the food pyramid will be available to the first order consumers?

- (a) 1
  - (b) 0.1
  - (c) 0.01
  - (d) 0.001
5. Examples of decomposers include
- (a) bacteria.
  - (b) fungi.
  - (c) bacteria and fungi.
  - (d) producers.
6. Which of the following is a reason why not all the energy at one trophic level is passed to the next level?
- (a) Animals can eat and digest all a plant or animal
  - (b) The pyramid of biomass gets smaller
  - (c) Energy is used in movement
  - (d) Energy level does not pass through trophic levels
7. After a trip to a lake, four students each drew a food chain showing the feeding relationships between four of the organisms. Which of the students drew the chain correctly?

- (a) marsh harrier → blue-billed duck → snails → algae
- (b) algae ← snails ← blue-billed duck ← marsh harrier
- (c) sun ← algae ← snails ← marsh harrier ← blue-billed duck
- (d) algae → snails → blue-billed duck → marsh harrier

8. Which of the following would contribute to the turbidity of water?

- (a) fine materials such as clay
- (b) stains that have come out of plants
- (c) microscopic algae that grow in the water
- (d) all of the above

9. Which of the following are abiotic factors?

- (i) trees
- (ii) reeds
- (iii) water
- (iv) pH
- (v) ducks
- (vi) air
- (vii) fish

- (a) (i), (ii), (iii)
- (b) (iii), (iv) and (v)
- (c) (iii), (iv) and (vi)
- (d) (iv), (v), (vi) and (vii)

10. Some ants live in *Acacia* trees. The trees provide shelter and food for the ants. The ants attack animals that attempt to eat the *Acacia* trees. The relationship between the ants and *Acacia* trees is an example of

- (a) mutualism.
- (b) competition.
- (c) parasitism.
- (d) collaboration.

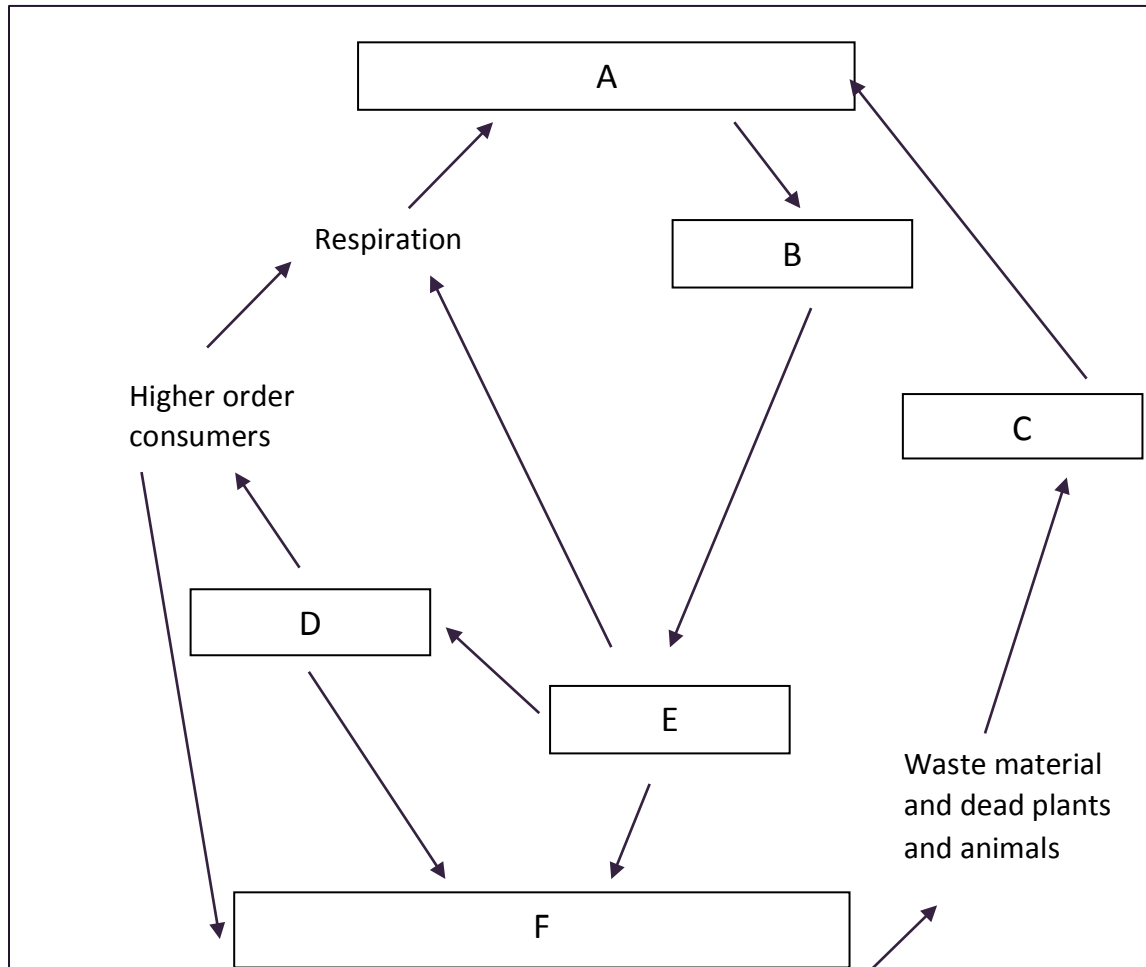
**End of Part A**

**Part B: Short answer**

**(44 marks)**

This section has **six** questions. Answer all questions in the spaces provided.

1. The diagram below shows how carbon cycles through an ecosystem.



The following terms are missing from the diagram: **herbivores** (primary consumers), **photosynthesis**, **the burning of fossil fuels**, **decomposers**, **plants** (autotrophs), **carbon dioxide in the atmosphere**.

Match the terms with the correct label.

(6 marks)

A \_\_\_\_\_

B \_\_\_\_\_

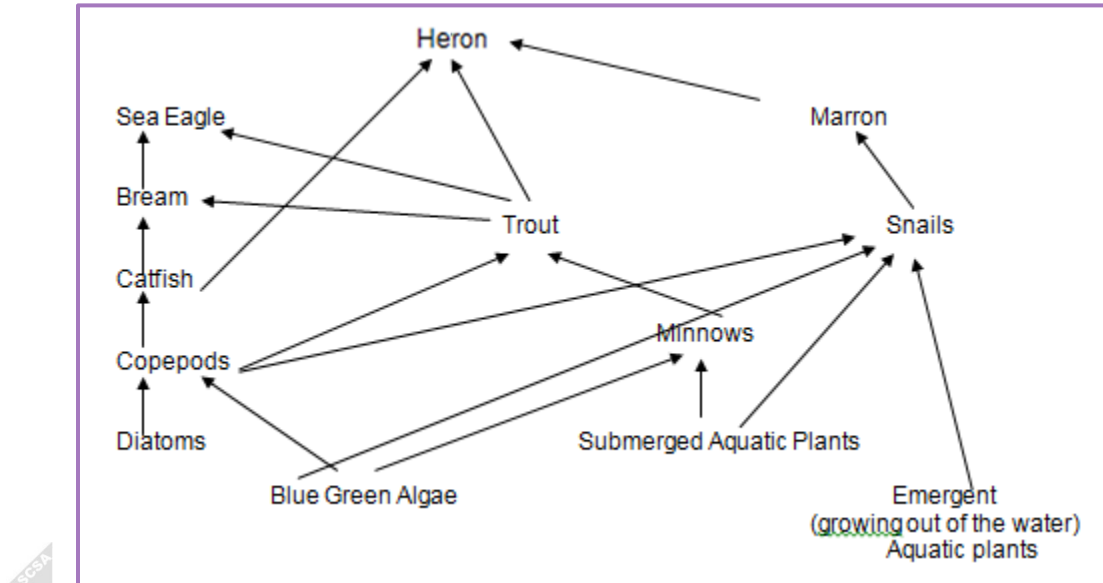
C \_\_\_\_\_

D \_\_\_\_\_

E \_\_\_\_\_

F \_\_\_\_\_

12. This question relates to the following diagram showing a simplified food web occurring in a freshwater lake community in Southern Australia.



- (a) Write **one** food chain from this food web. (1 mark)

- (b) For the food chain in (a), explain the following: (7 marks)

- (i) the original source of energy

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- (ii) the way that energy became trapped and usable in the food web

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- (iii) the way that energy passed through the food chain

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- (iv) **three** different ways that energy may be lost in the food chain.

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- (c) Using the food web, describe **three** impacts of an increase in nutrients flowing in the waterway. (3 marks)

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- (d) Indicate whether each of the following statements about the relationships between organisms in the freshwater lake community is true or false by circling the correct answer. Give one reason for each of your answers. (8 marks)

- (i) Heron and bream are competitors.

True/False

Reason: \_\_\_\_\_

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- (ii) Minnows are predators to trout.

True/False

Reason: \_\_\_\_\_

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- (iii) A decrease in the number of minnows in the freshwater lake community is likely to result in an increase in the number of trout in the lake.

True/False

Reason: \_\_\_\_\_

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- (iv) A decrease in the number of heron in the freshwater lake community is likely to result in an increase in the number of marron in the reserve.

True/False

Reason: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

13. Distinguish between the following terms:

- (a) competition and predation (2 marks)

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

14. Seagrass meadows support diverse communities of organisms. The organisms in the seagrass meadows acquire nutrients in a variety of ways. State whether each of the following organisms is an autotroph, a herbivore, a carnivore, an omnivore or a detritivore. (4 marks)

- (a) marine worms that feed on dead pieces of seagrass plants \_\_\_\_\_  
(b) photosynthetic algae that live attached to the seagrass plants \_\_\_\_\_  
(c) fish that feed only on other fish \_\_\_\_\_  
(d) dugongs (sea cows) that eat only seagrass plants \_\_\_\_\_

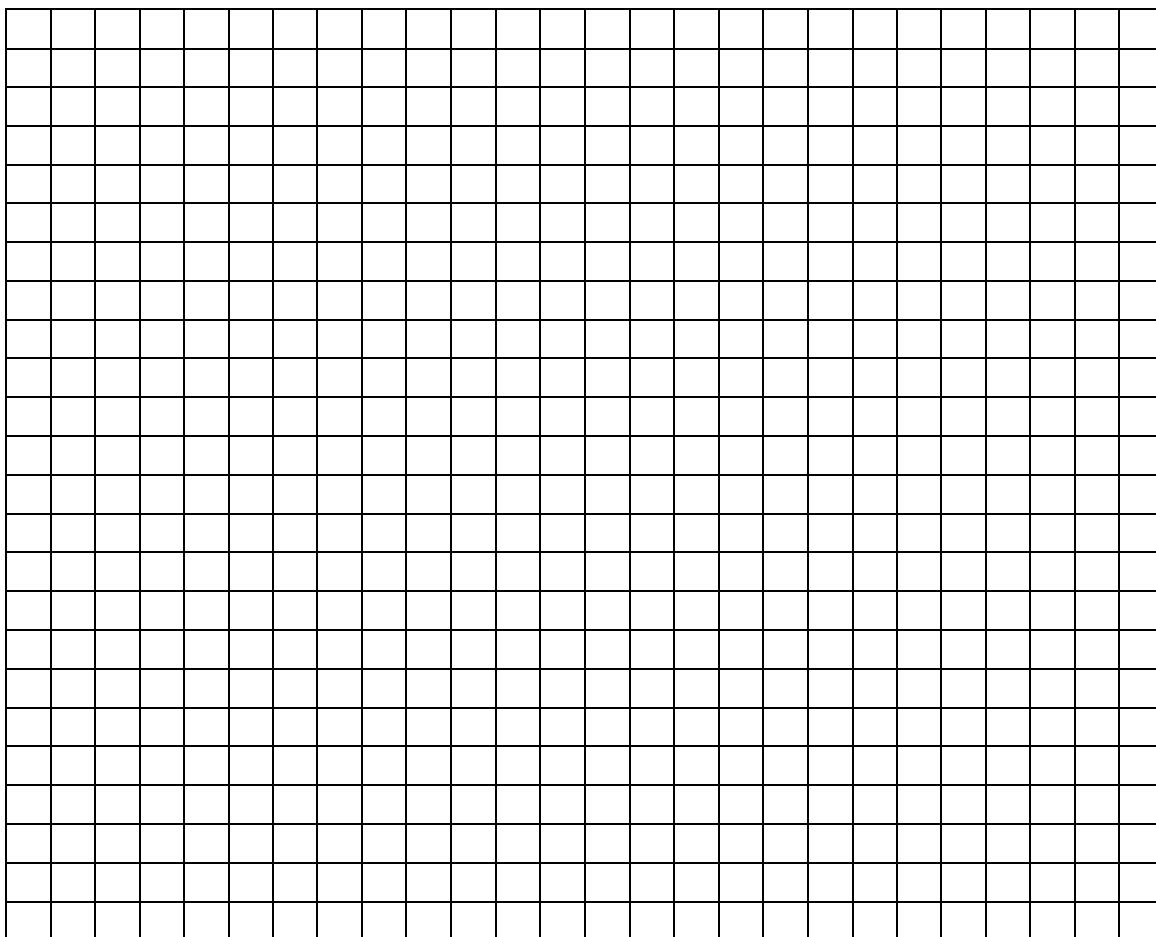


15. Some students in a class were investigating the relationship between water temperature and dissolved oxygen. They got some frozen ice blocks of distilled water and placed them in a container with a large opening at the top. They left the ice blocks until they melted and reached a temperature of 6°C. Using an oxygen probe, they measured the level of dissolved oxygen in the water as the temperature of the water rose. The data is shown below.  
(A gap in the data indicates the students failed to measure dissolved oxygen at this temperature.)

**Solubility of Oxygen in Pure Water Saturated with Oxygen**

Temperature (°C)	Dissolved Oxygen (mg/L)	Temperature (°C)	Dissolved Oxygen (mg/L)
6	12.0	14	10.0
7	11.8	15	
8	11.5	16	9.6
9		17	9.4
10	10.9	18	
11	10.7	19	9.0
12	10.4	20	
13			

- (a) Draw a line graph using all the data above on the grid below. (5 marks)



Use your graph to find the:

- (i) amount of dissolved oxygen present in water of 15°C in mg/L \_\_\_\_\_
- (ii) amount of dissolved oxygen present in water of 25°C in mg/L \_\_\_\_\_
- (iii) temperature at which water would contain 10.20 mg/L of oxygen in °C \_\_\_\_\_.

(3 marks)

- (b) Explain how an increase in temperature would affect the survival of organisms in a freshwater lake. (3 marks)

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16. Explain the role of Autotrophs within the Carbon Cycle. (2 Marks)

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**End of test**