

DAPTO HIGH SCHOOL



YEAR 11 BIOLOGY Preliminary Mid-Course Examination 2009

General Instructions:

- Reading time – 5 minutes
- Working time – 1 ½ hours
- Write using blue or black pen
- Write your Student Number/Name at the top of every page

TOTAL MARKS – 50

PART A

Total Marks (20)

Attempt ALL 20 questions, 1 mark for each question

Answer the questions on the multiple choice answer sheet provided

Allow about 30 minutes for this part of the examination

PART B

Total Marks (30)

Attempt ALL 8 short answer and extended response questions

Answer the questions in the spaces provided

Allow about 60 minutes for this part of the examination

This paper MUST NOT be removed from the examination room

PART A

20 marks

Attempt ALL questions

Mark your answers on the answer sheet provided

Select the alternative **A, B, C, D** that **best** answers the question

1. Why was Robert Hooke the first person to describe cells?

- (A) he invented the compound microscope
- (B) he invented the first reflecting telescope
- (C) he discovered cork
- (D) he invented staining techniques

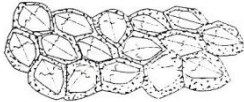
2. Poisons, such as DDT and dieldrin, accumulate in the body tissues.

Which of the following organisms is most likely to concentrate the highest levels of poisons in their body tissues?

- (A) producers
- (B) herbivores
- (C) carnivores
- (D) decomposers

3. The following diagram shows *Chaesipho columna*, the honeycomb barnacle.

Figure TT.6 Honeycomb barnacle



This organism is a small greyish barnacle, which has four plates. It often occurs in such numbers that the plates become hard to identify for any one individual. What would be the best way to determine the abundance of this barnacle?

- (A) percentage cover
- (B) capture-mark-recapture
- (C) tagging individuals and following their movement
- (D) count all individuals

4. Robert Brown made the following observation:

'In each cell of the epidermis of a great part of this family ... a single circular areola, generally more opaque than, the membrane of the cell, is observable. This areola, which is more or less distinctly granular, is slightly convex ...'

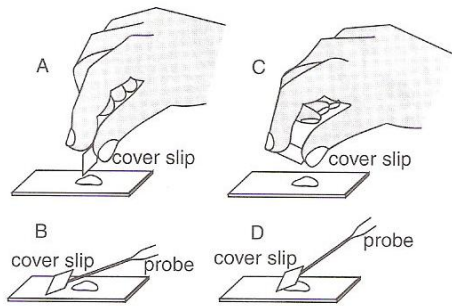
What was he describing?

- (A) mitochondria
- (B) chloroplast
- (C) nucleus
- (D) lysosome

5. Which organelles are mainly involved with the transformation of energy?

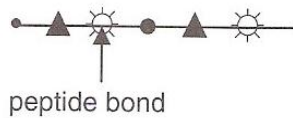
- (A) chloroplasts, mitochondria
- (B) lysosomes, nuclei
- (C) nuclei, mitochondria
- (D) lysosomes, chloroplasts

6. While investigating the difference between plant and animal cells, students needed to make wet mount slides of different tissues.



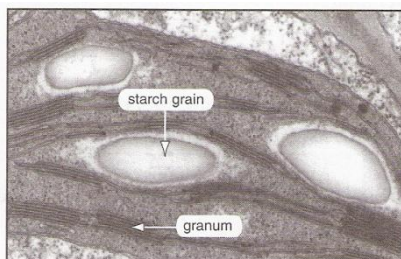
Which of the following methods is the preferable method to use when placing a cover slip on a prepared specimen on a microscope slide?

7. The diagram shows part of an organic molecule.



Identify the group this molecule belongs to.

- (A) carbohydrate
 - (B) proteins
 - (C) lipids
 - (D) nucleic acids
8. Which of the following would cause the most damage to the ecosystem?
- (A) introducing a foreign plant species into a suburban garden
 - (B) introducing a foreign plant species with no known predator into the bus
 - (C) using river water for human consumption
 - (D) building a house on an open area of grassland
9. The electron micrograph shows an organelle.



Which chemical reaction is the main function of this organelle?

- (A) respiration
- (B) photosynthesis
- (C) transpiration
- (D) translocation

10. A thin section of an unknown tissue was stained with several different dyes to determine if the tissue came from a plant or animal. Which of the following is least likely to show that the tissue came from a plant?

- (A) iodine showed starch granules
- (B) toluidine blue showed lignified cell walls
- (C) phloroglucin stained lignin in xylem cells
- (D) sudan IV stained lipid droplets

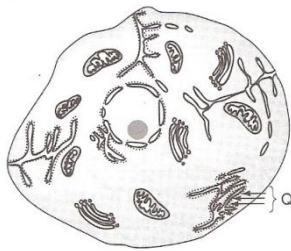
11. The following food chain shows the relationship between four organisms.

Grass → Grasshopper → Wolf Spider → Magpie

If the grass has 100 units of energy, how much of this energy reaches the magpie?

- (A) 50%
- (B) 10%
- (C) 1%
- (D) 0.1%

12. The diagram shows an animal cell with several organelles.



Which chemical test would identify the substances produced by structure Q?

- (A) biuret solution
- (B) Benedict's solution
- (C) iodine solution
- (D) Sudan IV

13. Which of the following correctly identifies the instrument and the abiotic variable in an ecosystem it is used to measure?

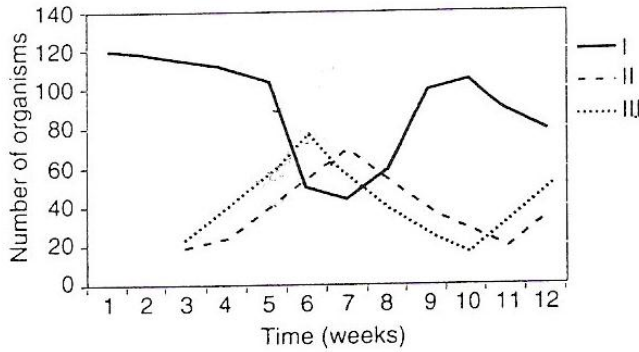
| | Abiotic Variable | Instrument |
|-----|------------------|---------------------|
| (A) | Wind speed | Barometer |
| (B) | Acidity | Universal Indicator |
| (C) | Humidity | Anemometer |
| (D) | Specific gravity | Thermometer |

14. Which of the following would be two of the most important abiotic factors determining the abundance and distribution of Australian organisms?

- (A) predators and food source
- (B) temperature and rainfall
- (C) water availability and introduced species
- (D) humidity and soil fertility

15. The graph shows the change in population size for three (3) freshwater pond species.

Figure TT.1 Population changes in a freshwater pond



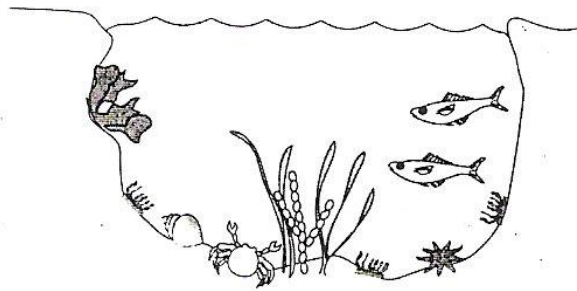
Animal Y was in abundance when Animals X and Z were introduced.
 Animal X preys on Animal Y
 Animal Z preys on Animal X

Which of the following correctly identifies each animal?

| | Line I | Line II | Line III |
|-----|----------|----------|----------|
| (A) | Animal X | Animal Y | Animal Z |
| (B) | Animal Y | Animal X | Animal Z |
| (C) | Animal Y | Animal Z | Animal X |
| (D) | Animal Z | Animal Y | Animal X |

16. The following diagrams shows the profile of a medium-sized rock pool.

Figure TT.8 Medium-sized rock pool profile

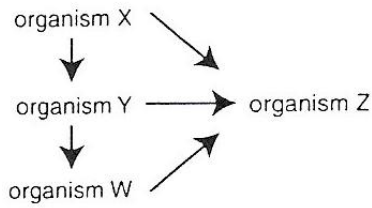


Which of the following correctly describes the temperature of this rock pool?

- (A) the same temperature as the ocean
- (B) higher than ocean temperature
- (C) lower than ocean temperature
- (D) higher during the day and lower at night than ocean temperature

17. The diagram shows part of a food web in an ecosystem

Figure TT.3 Food web

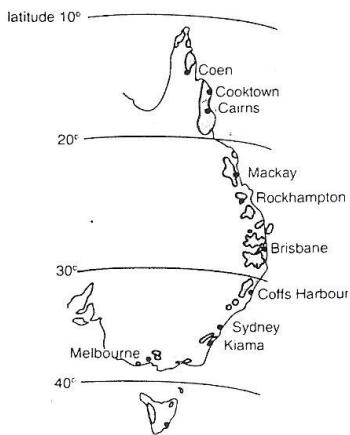


What can you deduce from this food web?

- (A) organism X provided chemical energy to all other organisms
- (B) organisms X, Y, W and Z must all be producers
- (C) the biomass of organisms Z is greater than the biomass of any other organism
- (D) organisms Y and W are parasites and organism Z is a decomposer

18. The map shows the distribution of rainforests in eastern Australia.

Figure TT.4 Rainforests in eastern Australia

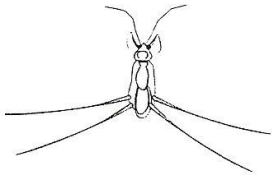


What can be concluded from this map?

- (A) all large rainforests are above 20° latitude
- (B) rainforests are only found in tropical areas
- (C) rainforests prefer conditions between latitudes 20° and 30°
- (D) factors other than latitude help determine the size of rainforests

19. The diagram shows an organism found in freshwater ponds.

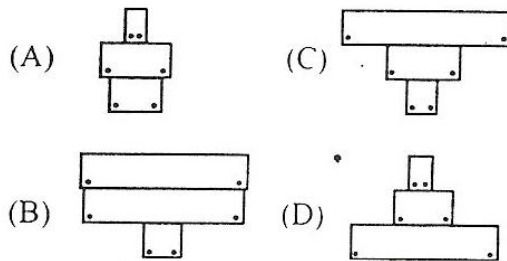
Figure TT.5 Invertebrate from a freshwater pond



Consider the structure of its legs and general body shape to determine its locomotion in the pond and where you would most likely find this animal.

- (A) swimming in the bottom layers of a quiet lake
- (B) burrowing into mud and ooze at the bottom of a quiet lake
- (C) walking on the surface of the water
- (D) clinging to rocks in a fast-flowing stream

20. Which of the following energy pyramids shows a balanced, self-sustaining ecosystem?



END OF PART A

PART B

30 marks

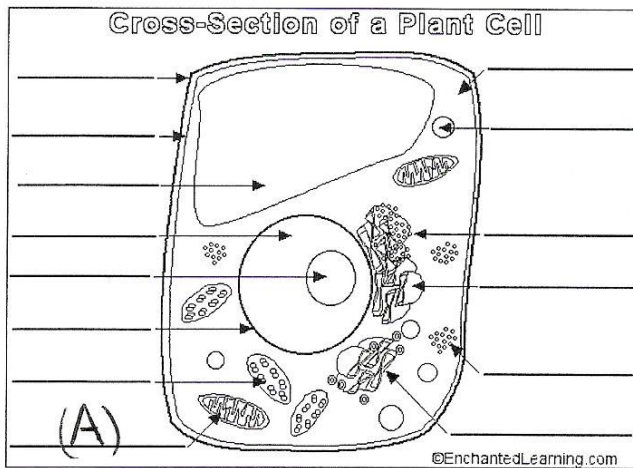
Attempt ALL questions

Answer the questions in the spaces provided

Marks

Question 21 (2 marks)

Study the diagram of the organelle below



- a) Identify the organelle labelled A. _____ **1**
- b) State its function _____ **1**

Question 22 (2 marks)

Write a word equation for photosynthesis.

2

Question 23 (2 marks)

Write a word equation for aerobic cellular respiration.

2

Question 24 (3 marks)

- a) Define adaptation. _____ **1**
- b) Identify one adaptation of a living organism to its particular environment. **2**

Marks

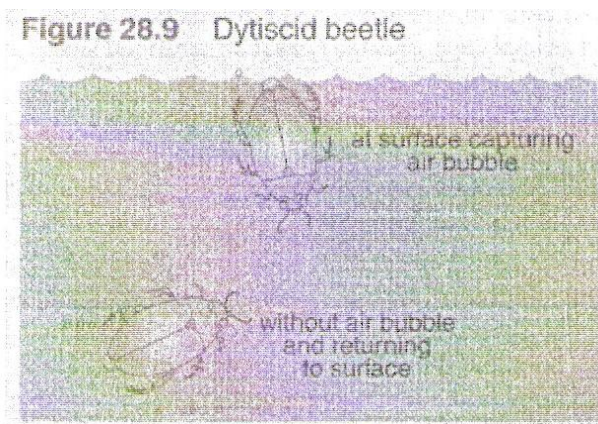
Question 25 (3 marks)

Construct a table to show the difference in TWO (2) named abiotic features between aquatic and terrestrial environments.

3

Question 26 (3 marks)

Dytiscid beetles are large black carnivorous beetles found at all levels in a freshwater pond.



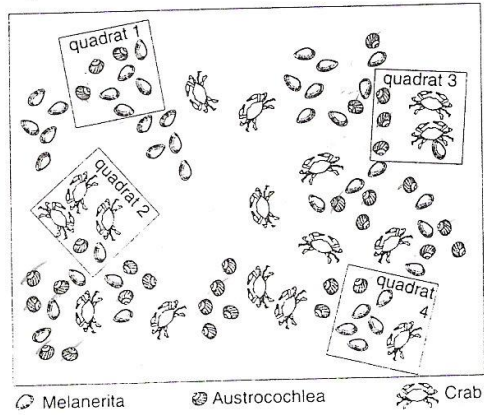
These beetles can be seen swimming to the surface ‘capturing’ a bubble of air between their wing tips and the end of their abdomen and then diving down again. Explain this behaviour.

3

Question 27 (9 marks)

Some senior biology students wished to estimate the abundance of each species on an area of rock platform. They decided to place four quadrats within the area, the following diagram shows an area of a rock platform with three (3) species and the location of the four (4) quadrats.

Figure TT.10 Three species on a rock platform



a) Construct a table to show the number of species in each four (4) labelled quadrats. 2

b) Calculate the average density of Austrocochlea per quadrat. _____ 1

c) If each quadrat is 1m x 1m in dimension and the total area is 19.2m², how many Austrocochlea would you ESTIMATE to be in the whole area? 1

d) How many Austrocochlea are actually in the whole area? 1

e) Calculate the percentage error in this quadrat method of calculating the number of organism in an area, using the formula:

$$\% \text{ deviation} = \frac{\text{difference between estimated and actual total}}{\text{actual total}} \times 100\% \quad 1$$

Marks

Question 27 (continued)

f) Comment on the validity and accuracy of these results. _____

g) Suggest one (1) way to improve the accuracy of this method. _____

1

Question 28 (6 marks)

Evaluate the method you used to estimate the abundance of a named species on your field trip.

6

END OF PART B

END OF EXAMINATION

DAPTO HIGH SCHOOL



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| <h2>YEAR 11 BIOLOGY</h2> <p>Preliminary Mid-Course Examination 2009</p> |
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Name: Result: $\frac{\quad}{20} + \frac{\quad}{30} = \frac{\quad}{50}$ %

PART A

MULTIPLE CHOICE ANSWER SHEET

Choose the BEST answer and place an X in the space on the grid provided.

| | A | B | C | D |
|----|---|---|---|---|
| 1 | | | | |
| 2 | | | | |
| 3 | | | | |
| 4 | | | | |
| 5 | | | | |
| 6 | | | | |
| 7 | | | | |
| 8 | | | | |
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| 17 | | | | |
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| 20 | | | | |

This paper MUST NOT be removed from the examination room