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Curriculum Council

TERTIARY ENTRANCE EXAMINATION, 1998

QUESTION/ANSWER BOOKLET

BIOLOGY

Please place your student identification label in this box

STUDENT NUMBER - In figures

In words

TIME ALLOWED FOR THIS PAPER

Reading time before commencing work: Ten minutes
Working time for paper: Three hours

MATERIAL REQUIRED/RECOMMENDED FOR THIS PAPER

TO BE PROVIDED BY THE SUPERVISOR

This Question/Answer Booklet
Separate Multiple Choice Answer Sheet
Standard Answer Book
Paper Binder

TO BE PROVIDED BY THE CANDIDATE

Standard Items: Pens, pencils, eraser or correction fluid, ruler

Special Items: A 2B, B or HB pencil for the separate Multiple Choice Answer Sheet and calculators satisfying the conditions set by the Curriculum Council.

IMPORTANT NOTE TO CANDIDATES

No other items may be taken into the examination room.

It is your responsibility to ensure that you do not have any unauthorised notes or other items of a non-personal nature in the examination room. If you have any unauthorised material with you, hand it to the supervisor BEFORE reading any further.

STRUCTURE OF THE PAPER

Section		Questions	Students should attempt	Marks	Suggested time/minutes
A	Multiple choice	1-30	ALL	60 (30%)	40
B	Short answers	31-35	ALL	100 (50%)	90
C	Extended answers	36*	Two parts	40 (20%)	50
		37*	Two parts		

Total marks = 200

* Questions 36 and 37 each consist of four optional parts, of which two should be attempted in each question.

INSTRUCTIONS TO CANDIDATES

Section A — Write your answers on the separate Multiple Choice Answer Sheet using a 2B, B or HB pencil. Do not use a ball point or ink pen. Marks are not deducted for wrong answers.

Section B — Write your answers in the spaces provided in this Question/Answer Booklet. Use a blue or black pen (not pencil) for this section.

Section C — Write your answers in the Standard Answer Book. Use a blue or black pen (not pencil) for this section. Do not copy the questions when answering; merely write the number of the question in the margin.

AT THE END OF THE EXAMINATION

Make sure that your Student Number is on your Question/Answer Booklet and Standard Answer Book(s).

Attach the Question/Answer Booklet to the FRONT of the Standard Answer Book(s) with the paper binder provided.

SEE NEXT PAGE

SECTION A (60 marks)

Suggested time: 40 minutes

Record an answer for Questions 1-30 by marking your choice of alternatives on the separate Multiple Choice Answer Sheet using a 2B, B or HB pencil.

If you want to change an answer, rub out your first answer and mark the new choice.
The answer sheet for Section A will be collected separately by the supervisor.

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1. It has been claimed that stable mature forests can help reduce the greenhouse effect by absorbing carbon dioxide (CO_2) through photosynthesis. There are many benefits from conserving mature natural forests but it is unlikely that they can effectively decrease atmospheric CO_2. Which of the following is the best explanation of this?

   (a) Too few mature forests are left to absorb large amounts of CO_2.
   (b) CO_2 uptake by green plants in mature forests is balanced by CO_2 released by consumers and decomposers.
   (c) Most CO_2 production occurs in cities which are far away from forests.
   (d) Photosynthetic CO_2 uptake in mature forests is very slow.

2. The following simple food chain was found to operate in a wetland.

   algae → micro invertebrates → macro invertebrates & fish → water birds

   It was estimated that the total biomass increase in the water birds during one season was 45 kg.

   If the efficiency of biomass conversion along this food chain is typical of most food chains, which of the following is the best estimate of the amount of growth by the algae?

   (a) 45,000 kg
   (b) 4,500 kg
   (c) 450 kg
   (d) 4.5 kg

3. A large area of inland Australia receives low average annual rainfall. The rainfall is unreliable, soils have low levels of nutrients and extreme temperatures occur. The tussock grass, *Triodia*, is one of the few types of plants that grow successfully in these areas.

   Which **one** of the following changes to the internal conditions of tussock grass would promote new growth in the normal habitat?

   (a) Increase in nitrogen content
   (b) Increase in carbon dioxide concentration
   (c) Increase in cell water content
   (d) Removal of debris by fire

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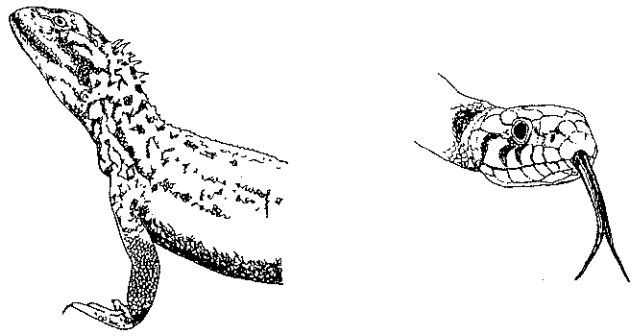
4. As primary producers, tussock grasses provide a resource for animal consumers. Which of the following best describes how animals benefit from eating the tussock grass?

(a) Animals obtain moisture from the cell contents of the grass.
(b) Animals obtain energy from carbohydrate, and nitrogen from protein in the cells.
(c) Grass which is exposed to sunlight provides heat energy for animals.
(d) Grass provides the nitrogen that animals need to produce excretory products.

5. Termites are important consumers in the tussock grass communities. Which of the following **does not** help to explain the success of termites?

(a) Termites are the most numerous animals in the arid region.
(b) Termites feed on dead grass during periods when no new plant growth occurs.
(c) Termites have a low metabolic rate, with consequent low food requirements.
(d) The temperature within termite mounds stays within narrow limits.



6. Many reptiles, especially snakes and lizards, live successfully as carnivores in arid areas of inland Australia. Fewer species of carnivorous mammals are successful. Which **one** of the following partly explains this?

(a) Reptiles are more effective than mammals at capturing animal prey.
(b) More toxic waste is produced by mammal carnivores than by reptile carnivores eating the same amount of food.
(c) Reptiles require less water than mammals to remove toxic waste from their bodies.
(d) The high metabolic rate of mammals results in great stress in high environmental temperatures.

7. Mammals and reptiles have different physiological responses to the temperature of their environment. Which of the following correctly describes one of these responses?

(a) The body temperature of reptiles is controlled entirely by the environmental temperature.
(b) The metabolic rate of a resting mammal drops in low environmental temperatures.
(c) At low environmental temperatures reptiles keep their body temperature above the surroundings by raising their metabolic rate.
(d) In hot conditions mammals use evaporative cooling.

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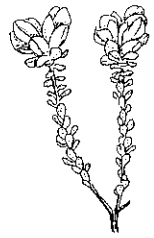

Yellow Bells

8. Yellow Bells is a small flowering shrub which occurs in a few small isolated populations in Western Australia. Recent studies have shown that different populations of Yellow Bells are genetically different. Alleles which occur in some populations do not occur in others. Which of the following is **not** a strong explanation for the genetic differences?

(a) Yellow Bells once grew in a much larger area. By chance, not all of the alleles in the original population occurred in the small remaining populations.
(b) New mutations have appeared in isolated populations in order for Yellow Bells to survive in different local environments.
(c) Alleles are lost from small populations by chance.
(d) Mutations occurred in small isolated populations, resulting in new alleles which have not been spread between the separate populations.

9. Some scientists predict that climate change in the next hundred years will bring about warmer, drier conditions in the south-west corner of Australia. Changed conditions could affect Yellow Bells in different ways. Which of the following is the **least likely** result of climate change?

(a) Soils could become drier for a longer period in each year causing stress to individual plants such that they could fail to produce flowers and seeds.
(b) Desert grasses could extend their range into the area where Yellow Bells occur, compete with them and cause their extinction.
(c) Populations of Yellow Bells could survive in areas further south from their present habitats, in locations where suitable conditions occur.
(d) Plants which presently compete with Yellow Bells could fail to survive in drier conditions, allowing Yellow Bells to thrive.

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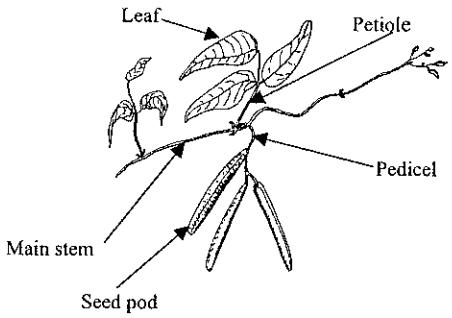
Questions 10 and 11

Questions 10 and 11 are based on the illustration below of a flowering plant.

Hardenbergia comptoniana



10. Which of the following correctly describes how material is transported in the plant?

(a) Carbohydrate in solution moves through the phloem from the roots to the leaves and other structures.
(b) Water and minerals from the soil move through the xylem from the roots to other parts of the plant.
(c) Water and minerals move through the phloem from the roots to other parts of the plant.
(d) Carbohydrate in solution moves through the xylem from the leaves to other structures.

11. Which of the following correctly describes movement of carbohydrate within the plant?

(a) Carbohydrate moves along the petiole by active transport from the leaf to the main stem.
(b) Carbohydrate moves with the transpiration stream along the petiole from the main stem to the leaf.
(c) Carbohydrate moves by diffusion from the seed pod along the pedicel to the main stem.
(d) Carbohydrate moves along a concentration gradient in the pedicel, from the main stem to the seed pod.

12. *All flowering plants have xylem tissue.* Which of the following best describes this statement?

(a) The statement is a generalisation.
(b) The statement is an observation.
(c) The statement is a conclusion.
(d) The statement is a theory.

13. A number of different statements were made during a biology class discussion of reproduction in plants. Which of the following statements is a scientific hypothesis?

(a) Different situations require different methods of plant propagation to be used.
(b) Growing plants from seeds is more rewarding than growing from cuttings.
(c) Plant cuttings which are potted in spring have a greater success rate than those potted in summer.
(d) If a plant has bulbs, these can be used for propagation.

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14. A field study was conducted to measure the effect of nitrate and phosphate fertilisers on the growth of lawn grasses. The table below shows the lawn density achieved with different applications of fertiliser.

Trial	Nitrate $g\ m^{-2}$	Phosphate $g\ m^{-2}$	Lawn density $kg\ m^{-2}$ dry mass
1	100	50	0.55
2	200	100	0.85
3	300	50	0.6
4	200	50	0.86
5	200	200	0.85

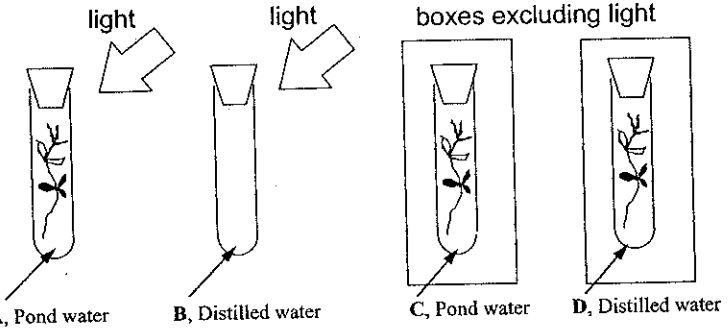
Which of the following is the best conclusion about lawn growth to be drawn from these data?

(a) Additional phosphate does not promote growth if nitrate levels are constant.
(b) The more nitrate is added to the lawn the better it grows.
(c) Lawn grass needs both nitrate and phosphate fertiliser to grow.
(d) The lawn would grow best if no phosphate was added.

15. In agriculture it is important to know how much fertiliser will give the best results. Which of the following best describes a serious ecological result of using excessive amounts of fertiliser?

(a) Agricultural areas with too much fertiliser become degraded by salt.
(b) When fertilisers break down they contribute to global warming.
(c) Excess fertiliser is a major cause of eutrophication in waterways.
(d) Fertilisers can accumulate in soil and cause soil pollution.

16. Students wanted to demonstrate that gas bubbles could be produced in a sealed container of water as a result of photosynthesis. They set up equipment in four ways, as shown in A, B, C & D below.



Which two of these arrangements could be used to make the demonstration convincing?

(a) B and C
(b) A and C
(c) A and D
(d) B and D

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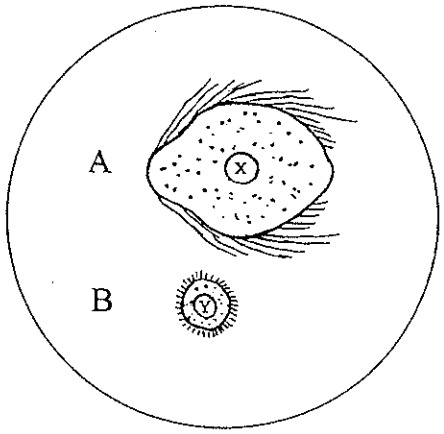
Questions 17, 18 and 19

Questions 17, 18 and 19 are based on the illustration which follows, showing two microorganisms labelled A and B, found in a sample of pond water. A student examines them using a microscope equipped with a 10X ocular lens and a 40X objective lens. The diameter of the field of view is 0.4 mm.



17. Which of the following statements most correctly describes the relative sizes of the two organisms?

(a) A has approximately 5 times the volume of B.
(b) A is approximately 18 μm long and B is approximately 4 μm long.
(c) A is approximately 180 μm long and B is approximately 50 μm long.
(d) The maximum width of A is close to 700 μm and the maximum width of B is close to 400 μm.

18. If the objective lens is changed from 40X to 10X, which of the following will be the new field diameter?

(a) 0.1 mm
(b) 1.0 mm
(c) 1.6 mm
(d) 4.0 mm

19. Organelles X and Y are located at the centres of cells A and B respectively in the diagram. The supply of oxygen to the organelles X and Y occurs entirely by diffusion. Which of the following statements is correct?

(a) More oxygen will reach X than Y because the surface area of A is greater than the surface area of B.
(b) More oxygen will reach Y than X because the surface area of B is greater than the surface area of A.
(c) More oxygen will reach X than Y because the cytoplasm of A contains more oxygen than the cytoplasm of B.
(d) More oxygen will reach Y than X because oxygen has less distance to diffuse from the cell membrane.

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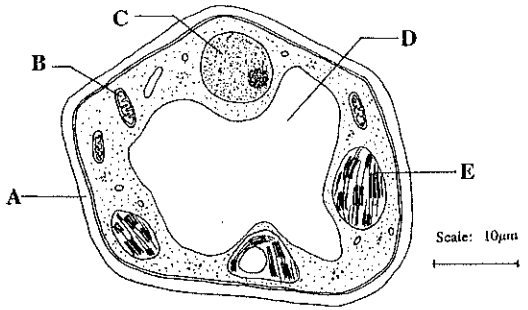
Questions 20, 21 and 22

Questions 20, 21 and 22 relate to the figure below which shows a cell from a plant.



20. Which of the labelled structures listed below distinguish this cell from an animal cell?

(a) A and E
(b) B and D
(c) C and E
(d) A and C

21. If the plant was deprived of water, which structure would be most likely to show observable change?

(a) A
(b) B
(c) C
(d) D

22. A cell from a different part of the plant was observed to have large numbers of organelle E. Which of the following is most likely to be a major function of that cell?

(a) Secretion of a waxy cuticle.
(b) Photosynthesis.
(c) Movement of water through the plant.
(d) Gas exchange in the leaves.

23. Which of the following events does **not** occur in a cell which is undergoing mitosis?

(a) Homologous chromosomes break and rejoin in late prophase.
(b) Centromeres attach themselves to a spindle during metaphase.
(c) DNA in the nucleus replicates itself in early prophase.
(d) Centrioles move to opposite poles of the cell prior to metaphase.

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Questions 24, 25 and 26

Questions 24, 25 and 26 refer to the information below.

In birds, sex is determined by chromosomes designated Z and W. Male birds have two Z chromosomes (ZZ) and female birds have one of each type (ZW). In one type of poultry, plumage colour is controlled by an allele located on the Z chromosome. The allele for silver plumage (S) is dominant to the allele for gold plumage (s).

24. Which of the following statements is true of birds?

(a) Females have homologous sex chromosomes.
(b) Sex of the offspring is determined by the chromosomes of the sperm.
(c) Males produce two types of gamete.
(d) Sex of the offspring is determined by the chromosomes of the egg.

25. In a poultry breeding experiment, a silver-coloured female is mated with a silver-coloured male, resulting in the production of twelve offspring. Six of the offspring are male and six are female. Which of the following would be an **unexpected** outcome of the mating?

(a) All male offspring are silver-coloured.
(b) All female offspring are silver-coloured.
(c) Some male offspring are gold-coloured.
(d) Some female offspring are gold-coloured.

26. Which of the following is a true statement about the expression of the allele for gold plumage colour?

(a) Females are more likely to have gold plumage because they have only one Z chromosome.
(b) Males are more likely to have gold plumage because they have two Z chromosomes.
(c) Males and females are equally likely to have gold plumage.
(d) Males will not have gold plumage because they lack a W chromosome.

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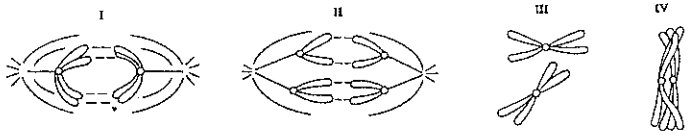
Questions 27 and 28

Questions 27 and 28 refer to the following diagrams of a single pair of homologous chromosomes shown at different times during a meiotic division. Each diagram represents an event at a single stage of meiosis.



27. Which of the following is a genetic consequence of the event shown at IV?

(a) Mutations on chromosomes are shared equally in the resulting daughter cells.
(b) All resulting cells are genetically identical.
(c) Homologous chromosomes become genetically more similar.
(d) Gametes from the same parent cell become genetically more different.

28. Which of the diagrams above represents the final stage in the movement of the chromosomes during cell division?

(a) I
(b) II
(c) III
(d) IV

29. The total number of humans in the world is now more than at any previous time. Which of the following is the most direct consequence of the large number of humans?

(a) Failure of many important open ocean fisheries in recent years.
(b) Loss of agricultural land to rising levels of salt.
(c) Increase in ultraviolet radiation through a weakened ozone layer.
(d) Loss of biodiversity as more resources are directed to humans.

30. In recent years many people have expressed concern that human activity is causing harmful changes on planet Earth. Which of the following is most likely to be a direct consequence of human activity?

(a) Chemicals in the atmosphere causing weakening of the ozone layer above the poles.
(b) Prolonged droughts in eastern Australia associated with the El Nino Southern Oscillation.
(c) Changes to the area of Antarctic sea ice between summer and winter of each year.
(d) Atmospheric carbon dioxide acting as an insulating layer which keeps the Earth warm.

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SECTION B (100 marks) Suggested time: 90 minutes

Attempt all questions in this section. Write answers in the spaces provided. Use black or blue ink or ball point pen.

31. (20 marks)

Research in a forest ecosystem produced data on the diets of some of the common animals.

Animal	Diet
Small mammals	Seeds, insects
Owls	Small mammals, lizards
Insects	Leaves
Hawks	Small mammals, small birds
Lizards	Insects

(a) Construct a food web to show the feeding relationships of the organisms listed above. (4 marks)

(b) (i) Name the feeding niche of

the owls _____ and the insects _____

(ii) The data indicate that some animals are in competition for resources.

Name **two** competing animals. _____ and _____

and the resource for which they compete: _____ (4 marks)

(c) An orchard close to the forest was sprayed with a fungicide which, at the recommended levels of application, was not directly harmful to animals. Some time later, dead owls and hawks were found in the forest. No other animals were affected. Briefly explain how these deaths might have been caused. (4 marks)

_____

_____

_____

_____

(d) Human activity close to natural ecosystems almost always causes changes to the way in which the ecosystems function. Name one biotic and one abiotic factor resulting from human activity and explain how each could affect a natural ecosystem such as a forest.

Biotic factor: _____

_____

_____

Abiotic factor _____

_____

_____ (4 marks)

(e) Most Australian cities have some areas set aside for conservation of natural bushland. However, many of these areas are small and they are isolated. Explain why conservation areas should be large and interconnected to be of greatest value. (4 marks)

(i) Conservation areas should be large because _____

_____

_____

_____

(ii) Conservation areas should be interconnected because _____

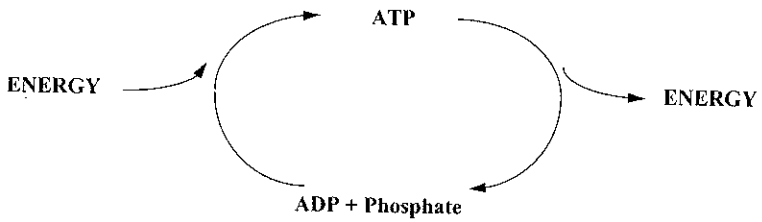
_____

_____

_____

32. (20 marks)

The diagram below shows the ATP cycle. This represents the formation of ATP within a cell and its breakdown to ADP and phosphate. Energy is needed for the formation of ATP and energy is released when it breaks down. In a typical cell, 10 million molecules of ATP are consumed and regenerated in this way every second.



(a) Name **two** possible sources of energy for this process in a plant cell and two possible sources of energy in an animal cell.

Plant cell (i) _____

(ii) _____

Animal cell (i) _____

(ii) _____

(4 marks)

(b) Name **four** cellular processes which depend on the energy provided by ATP.

(i) _____

(ii) _____

(iii) _____

(iv) _____

(4 marks)

(c) State two properties of ATP which make it effective as a substance for transferring energy in cells.

(4 marks)

(i) _____

(ii) _____

(d) Yeast is a unicellular fungus which can thrive and grow in a wide variety of conditions. In bread making, yeast is evenly distributed through the dough and left for some hours before baking.

Yeast cells on the surface of the dough and yeast cells at the centre of the mixture are in different environments. Describe how this could affect the metabolism of the cells

(4 marks)

on the surface _____

_____

at the centre _____

_____

(e) Methane is an energy-rich flammable gas which bubbles to the surface of deep, still lakes with rich organic sediments. Carbon dioxide is the end product of metabolism in other lakes. Explain why respiration in some lake sediments results in an energy-rich end product rather than carbon dioxide.

_____

_____

_____

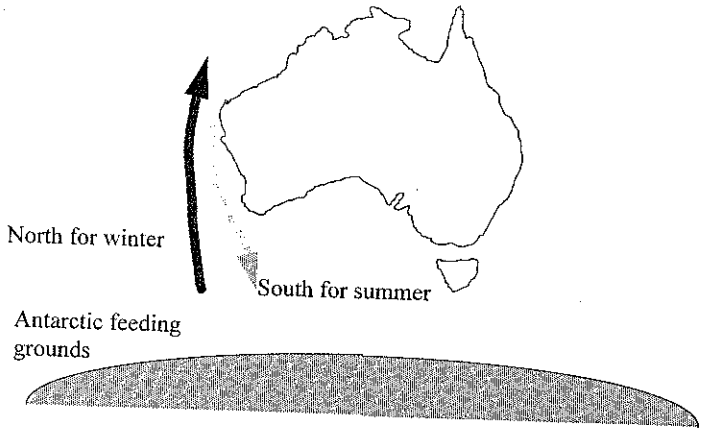
_____

_____

(4 marks)

33. (20 marks)

Each year humpbacked whales migrate along the coast of WA. During summer, when the waters of the Southern Ocean are highly productive, they feed and gain weight. During the winter they occur in waters to the north of WA. Whales must use a lot of energy during the long migration between their summer and winter locations.



(a) State **one** likely advantage or disadvantage to the whales of spending time in each different habitat

Advantage of being in the south in summer	
Disadvantage of being in the south in winter	
Advantage of being in the north in winter	
Disadvantage of being in the north in summer	

(4 marks)

(b) Even in very cold water the internal temperature of whales is close to that of other mammals in more moderate environments. State **two** different ways in which heat energy would be gained and heat energy would be lost by whales.

Heat energy gain:

(i) _____

(ii) _____

Heat energy loss:

(i) _____

(ii) _____

(4 marks)

(c) During summer whales, penguins and some fish feed on small crustaceans called krill. A diet of krill results in nitrogenous wastes. Complete the table below naming the excretory substance and describing the form in which it leaves the body of each type of animal.

(4 marks)

Type of animal	Excretory substance	The form in which it leaves the body
Fish		
Penguin		
Seal		

(d) The rate at which an animal uses energy is called the metabolic rate (MR). MR is usually stated for each gram of animal body mass.

(i) Give an example of suitable units for stating MR.

_____

(ii) Explain an advantage of stating MR in terms of one gram of body mass.

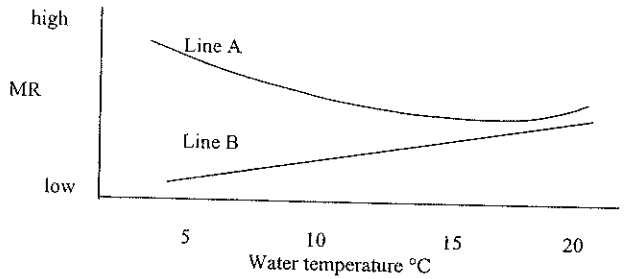
_____

_____

(4 marks)

Question 33 (continued)

(e) The figure below shows the MR of a resting fish and a resting small whale over a range of water temperatures. Decide which line represents the fish and which the whale and briefly explain your decision.



The fish is represented by line _____ (A or B) because _____

_____

The whale is represented by line _____ (A or B) because _____

_____

(4 marks)

34. (20 marks)

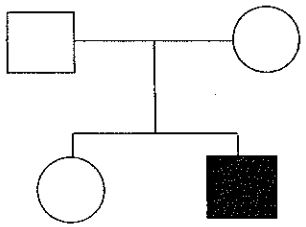
Albinism in mammals is a lack of skin pigmentation caused by a recessive autosomal allele. In the pedigree shown below, a man and a woman, both normally pigmented, have one albino child and one normally pigmented child.

Male without the trait

Male with the trait

Female without the trait

Female with the trait



(a) Explain the term "recessive autosomal allele". (4 marks)

_____

_____

_____

(b) Using the letter P for the dominant allele for normal pigmentation, write the genotype of

(i) the mother _____ (ii) the father _____

(iii) the son _____ (iv) the daughter _____

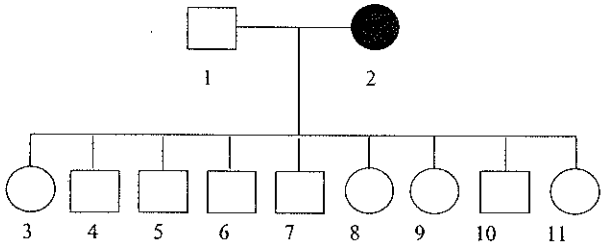
If the couple has a third child, what is the probability that it will be a boy with normal pigmentation?

_____

(4 marks)

Question 34 (continued)

While investigating inheritance of albinism, a student obtains an albino female mouse and a male mouse with normal pigmentation and allows them to breed. All offspring (the F1 generation) have normal pigmentation, as shown below.



When they reached sexual maturity, mice 3 and 6 were allowed to breed to produce an F2 generation.

(c) In the space below, show the genotype and phenotype ratios that would be expected in the F2 generation. (4 marks)

A normally pigmented mouse in the F2 generation is selected for further study but the student is unsure whether it is heterozygous or homozygous for the characteristic. (4 marks)

(d) Define the terms

(i) Heterozygous _____

_____

(ii) Homozygous _____

_____

(e) Describe a proceuure the student could use to determine the genotype of the normally pigmented mouse. (4 marks)

_____

_____

_____

35. (20 marks)

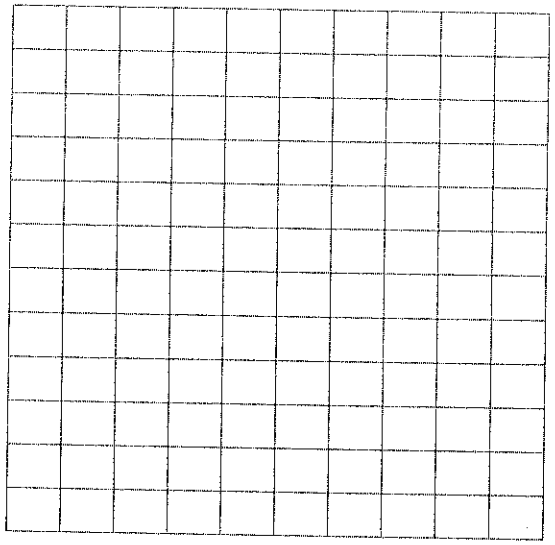
Chaetoceros sp. is a single celled alga. In a study of the effect of silica on the growth of *Chaetoceros* sp. cultures were set up with and without silica in the culture medium. On Day 0 each culture had 400,000 *Chaetoceros* cells per mL. The table below shows the cell numbers in each culture at intervals during the following eight days.

Table X: Number of *Chaetoceros* cells (millions per mL)

	Day 1	Day 4	Day 7	Day 8
Chaetoceros with silica	1.105	3.510	5.200	5.210
Chaetoceros without silica	1.005	2.050	2.250	2.300

(a) Use the grid below to present these data graphically.

(In case you wish to have a second attempt at this item, the grid is repeated at the end of the examination book. Indicate clearly if you have used the second grid.)



(4 marks)

(b) (i) State an hypothesis that the investigators may have been testing in this study.

_____

_____

(ii) Name the independent variable _____

Name the dependent variable _____ (4 marks)

(c) (i) Write a conclusion from these data on growth of *Chaetoceros*.

_____

_____

(ii) Suggest an explanation for the patterns in the data during each of the periods:

Day 0 to Day 4 _____

_____

Day 7 to Day 8 _____

_____ (4 marks)

(d) Name **four** possible variables that should be controlled in this work on *Chaetoceros*.

1. _____

2. _____

3. _____

4. _____ (4 marks)

(e) Briefly describe **two** procedures which could be used to increase reliability of data in work such at this.

_____

_____

_____

_____ (4 marks)

SECTION C (40 marks)

Suggested time: 50 minutes

ANSWER SECTION C IN THE STANDARD ANSWER BOOK

SECTION C consists of two questions, 36 and 37. There are four parts to each question. You must answer **two** parts from 36 and **two** parts from 37. Each part carries ten (10) marks.

Question 36 mainly tests your **knowledge** of syllabus content. Question 37 mainly tests **how you apply** your understanding of biological principles.

Answers may be presented in different ways provided that they communicate your ideas effectively. You may choose to

- present a clearly labelled diagram
- write notes beside a clear diagram
- write lists of points, with sentences which link them
- present information as a table
- write concisely worded sentences
- use some other appropriate way to present ideas.

Marks may be deducted for answers which are poorly presented or difficult to read. Use black or blue pen or ball point for written answers and pencil for diagrams.

Question 36. Answer any two from 36a to 36d. (10 marks for each)

36a. Biological processes such as photosynthesis and respiration involve chemical reactions which proceed in distinct stages, each stage being catalysed by a different enzyme.

Explain why these reactions must proceed in stages and describe the features of enzymes that make that possible.

36b. In a natural woodland and in a city the ecological processes of energy flow and nutrient movement take place.

Describe the movement of biological energy and the movement of nutrients that take place as humans live in a modern city.

36c. Antibiotics have been used for about 50 years to combat bacterial infections in humans and in livestock. In recent years concern has been expressed that more and more strains of bacteria have become resistant to almost all antibiotics.

Explain the possible processes by which bacteria have developed resistance.

36d. Increasing soil salinity is reported for large areas of Australia. This has serious economic and ecological consequences because the growth of plants is affected.

Explain the effects of soil salt on the physiology of plants such that they are unable to grow.

SEE NEXT PAGE

Question 37. Answer any two from 37a to 37d. (10 marks for each)

37a. Hundreds of different species of marine gastropods live around the coast of Australia. In some species, reproduction involves release of a few eggs which hatch as small snails in the same locality as the parents. In others, large numbers of larvae hatch from eggs and swim freely for periods between a week and a year, depending on the species.

Explain how each of the two life history patterns might affect how frequently new species of gastropod are formed and how frequently species become extinct.

37b. From generation to generation information controlling the processes that occur in living cells is carried in DNA. Explain how the structure of DNA can carry information which can be accurately copied during cell division.

37c. Most aquatic mammals are large animals and many of them are able to live in very cold water. Some quite small land mammals can live in cold environments but they live on land, immersed in air, not in water.

Explain why being small might be more of a disadvantage for aquatic mammals than for land mammals.

37d. Gardeners in Western Australia who prefer to grow native Australian plants have been advised to plant local area plants rather than plants brought from other parts of the country. Many have resisted this advice, claiming that local plants become more badly damaged by insects than plants from other areas.

Explain the ecological benefits that could come from maintaining local native plants in gardens.

END OF PAPER