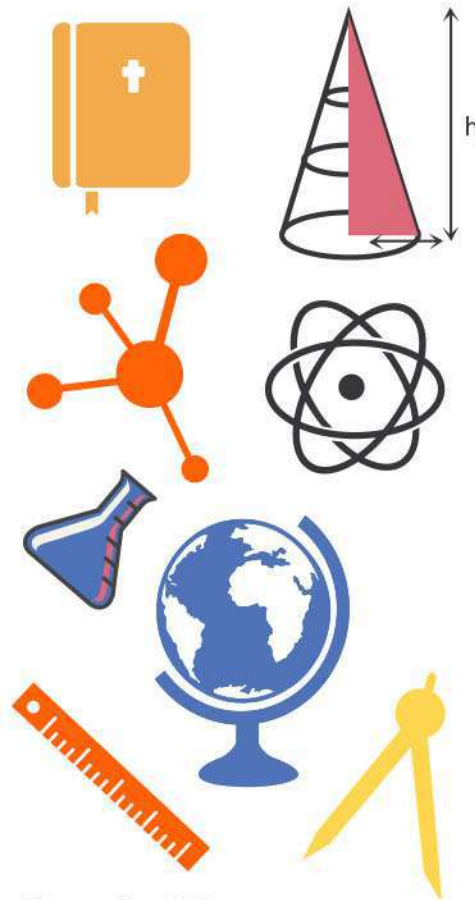


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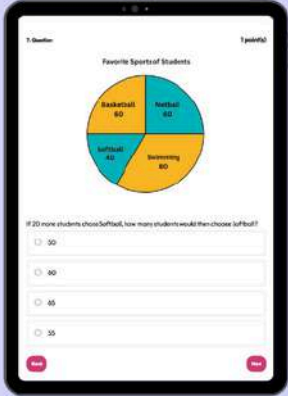


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3009/1

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BIOLOGY

PAPER 1 3009/1

Monday

19 MAY 2025

9:00 a.m.–10:15 a.m.
(1 hr. 15 mins.)

MINISTRY OF EDUCATION NATIONAL EXAMINATIONS

BAHAMAS GENERAL CERTIFICATE OF SECONDARY EDUCATION

INSTRUCTIONS AND INFORMATION FOR CANDIDATES

Do not open this booklet until you are told to do so.

Write your school number, candidate number, surname, name and initials in the spaces provided above.

There are fifty questions on this paper.

Answer **ALL** questions.

For each question, there are four possible answers labelled **A, B, C, and D.**

Choose the one you consider correct and circle the **LETTER** of your choice in the booklet.

Calculators are permitted however **NO** graphing calculators are allowed.

FOR EXAMINER'S USE ONLY

Total marks

This question paper consists of 22 printed pages and 2 blank pages.

1. The scientific name for a ruby-throated hummingbird is *Archilochus colubris*.

What do the two words in the name *Archilochus colubris* represent?

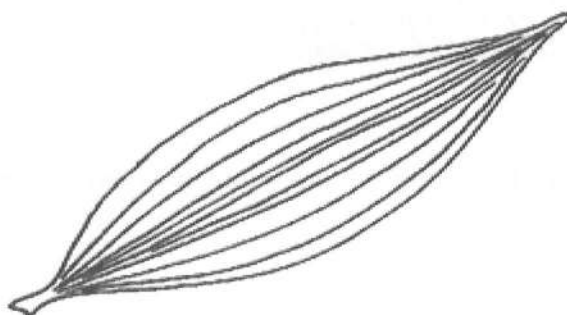
- A family, class
 - B genus, species
 - C kingdom, phylum
 - D order, taxon
2. Which equipment would be most suitable for carrying out a study of vegetation in a woodland?
- A a measuring tape and a pit fall trap
 - B a measuring tape and a quadrat
 - C a quadrat and a sweep net
 - D a pit fall trap and a sweep net
3. Which of the following includes organisms of only one species?
- A community
 - B ecosystem
 - C kingdom
 - D population
4. Which of the following is an example of an abiotic factor in an ecosystem?
- A competition
 - B fern
 - C predation
 - D sunlight



5. What are characteristics of the Nassau Grouper?

	body covered with scales	body temperature changes	has a lateral line
A	✓	✗	✗
B	✓	✓	✓
C	✗	✗	✗
D	✗	✓	✓

6. The diagram shows a leaf from a plant.

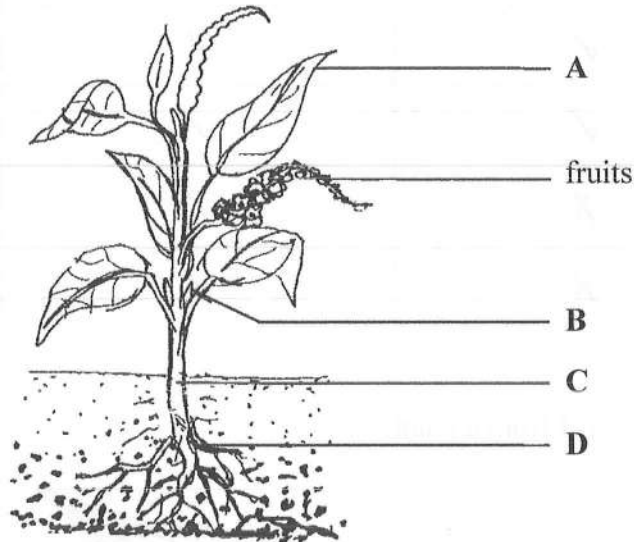


Which feature is **not** expected in a plant with leaves of this type?

- A flowers have petals in multiple of three
- B narrow leaves with parallel veins
- C one cotyledon
- D vascular bundles in the stem are arranged in a distinct ring so that they are all about the same distance from the centre

7. The diagram shows a growing plant.

Which of the labelled parts provides sugars to the developing fruits for growth?



8. Which term refers to the place within an environment where a species of organism lives?

- A community
- B ecosystem
- C habitat
- D niche

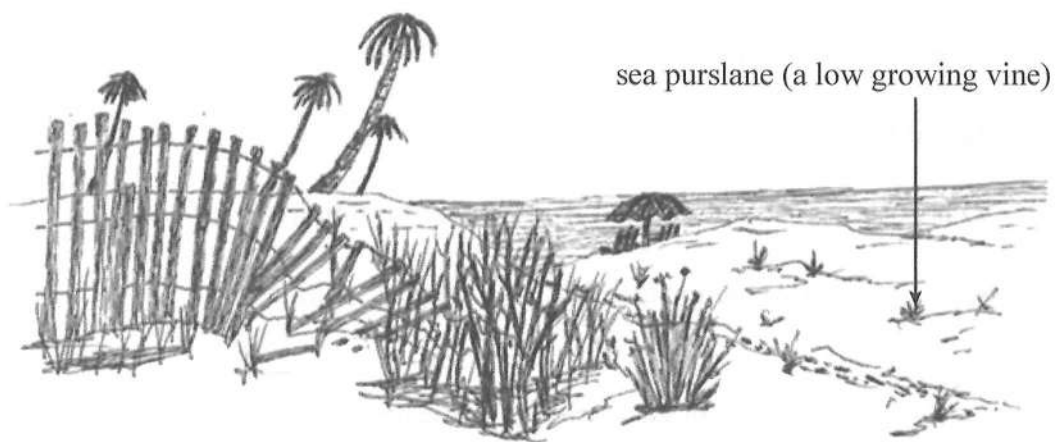
9. Bahamian Pine forests are regularly affected by forest fires. These fires kill competitor species, and create space for seeds of Caribbean pine trees to germinate and grow.

Which statement about Bahamian pine forests is correct?

- A Adult Caribbean pine trees are usually killed by forest fires.
- B Seedlings and young Caribbean pine trees are very resistant to heat and survive forest fires unharmed.
- C The bark of Caribbean pine trees burns easily and for long periods of time due to the resin that the bark contains.
- D Without forest fires, Bahamian pine forests would be replaced by hardwood forest.



10. Why are bacterial cells classified as prokaryotic cells?
- A Their genetic material is not found within the nucleus.
 - B They are simple and small.
 - C They have a cell wall.
 - D They reproduce by budding.
11. Which organism does **NOT** have protected status in a Bahamian National Park?
- A Bahamian boa constrictor
 - B Bahamian parrot
 - C Bahamian swallow tail butterfly
 - D green turtle
12. The diagram shows a section of a sandy seashore.



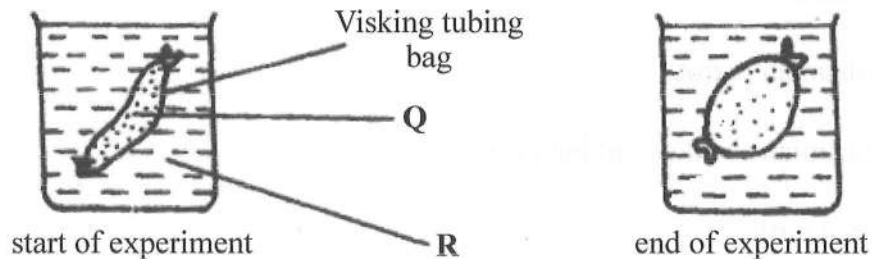
In which zone of the sandy seashore are low-growing vines such as sea purslane typically found?

- A intertidal zone
- B fixed dune zone
- C pioneer zone
- D spray zone

13. Which National park is the site of the largest breeding colony of West Indian flamingoes?

- A Abaco National Park
- B Bonefish Pond National Park
- C Inagua National Park
- D Lucayan National Park

14. The diagram shows an experiment that is set up to show the movement of substances across Visking tubing. Visking tubing is partially permeable.

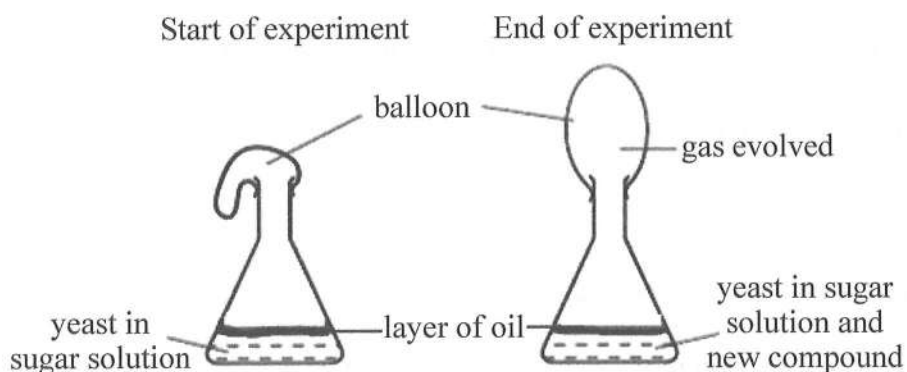


Which statement identifies a combination of Q and R that could lead to the results shown in the diagram?

- A Q and R are both distilled water.
 - B Q and R are both 20% sucrose solution.
 - C Q is 20% sucrose solution and R is 1% sucrose solution.
 - D Q is 1% sucrose solution and R is 20% sucrose solution.
15. Which process is responsible for gas exchange in the lungs?
- A active transport
 - B diffusion
 - C osmosis
 - D translocation



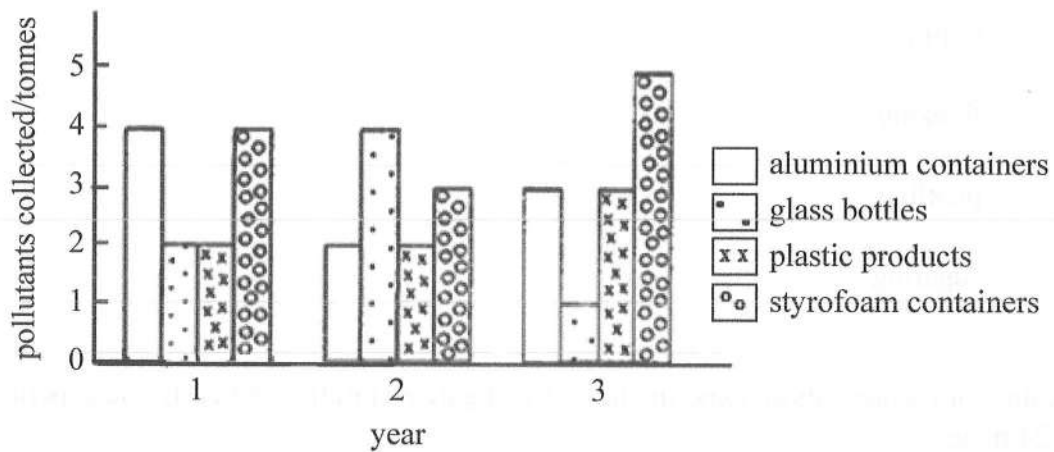
16. Which of the following food preservation technique creates a high solute concentration that restricts the growth of microbes?
- A boiling
 - B freezing
 - C pickling
 - D sugaring
17. The diagram represents an experiment to investigate respiration in yeast. The experiment was left for 24 hours.



Which statement correctly explains the increase in the size of the balloon?

- A Oxygen is produced because of aerobic respiration.
- B Oxygen is produced because of anaerobic respiration.
- C Carbon dioxide is produced because of aerobic respiration.
- D Carbon dioxide is produced because of anaerobic respiration.

18. The diagram shows the quantities of various land pollutants that were collected on a beach in southern New Providence over a 3 year period.



Which pollutant was collected in the largest quantities over the three years?

- A aluminium cans
- B glass bottles
- C plastic containers and rings
- D styrofoam containers
19. Which of the following statements about haemoglobin is correct?
- A Haemoglobin binds tightly to both oxygen and carbon dioxide.
- B Haemoglobin decreases the ability of the blood to transport carbon dioxide.
- C Haemoglobin increases the ability of the blood to transport oxygen.
- D Most of the haemoglobin is dissolved in the plasma.
20. Which type of tooth is most efficient in breaking up pieces of food for chemical digestion to occur?



A



B



C



D



21. Which row correctly describes the functions of the large intestine and stomach respectively?

	large intestine	stomach
A	breaks down carbohydrates	filters the blood to remove wastes
B	breaks down food into smaller molecules	reabsorbs water from undigested food
C	filters the blood to remove wastes	breaks down carbohydrates
D	reabsorbs water from undigested food	breaks down molecules of food into smaller molecules

22. What is one function of white blood cells?

- A** carry oxygen around the body
- B** engulf invading bacteria
- C** heal cuts and bruises
- D** produce mucous

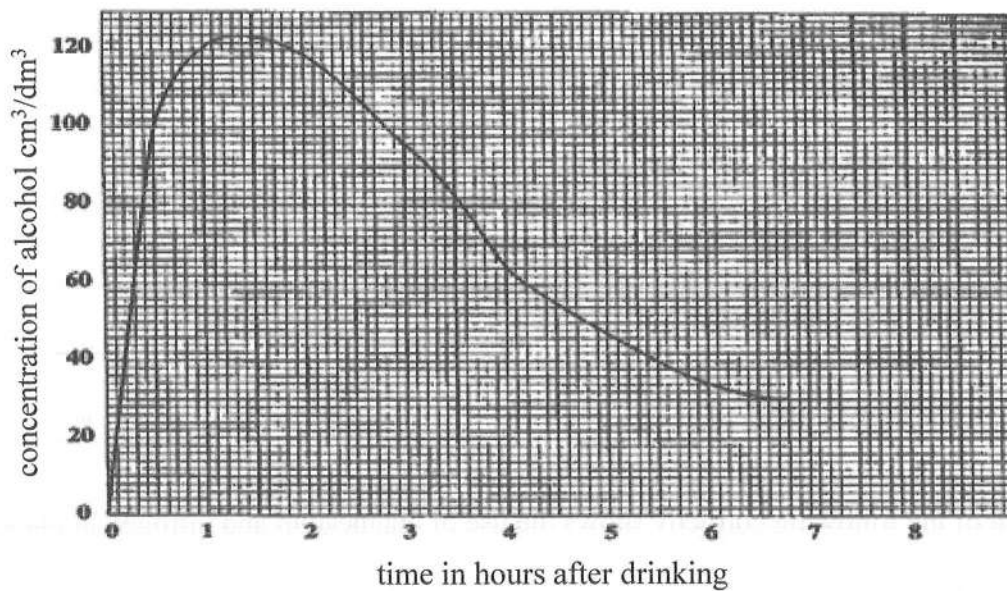
23. Which of the following correctly shows the use of magnesium and nitrogen in plants?

	magnesium	nitrogen
A	to make carbohydrates	to make chlorophyll
B	to make chlorophyll	to make proteins
C	to make proteins	to make roots healthy
D	to make roots healthy	to make carbohydrates

24. Which of the following statements is correct about lymphatic vessels that are rich in fats?

- A They are found only in the large intestines.
- B They are found only in the pancreas.
- C They are found in the small intestines.
- D They are found in the stomach.

25. The diagram shows the concentration of alcohol in cm^3/dm^3 blood over an 8 hour period.



If the legal limit to drive is $80 \text{ cm}^3/\text{dm}^3$ and under, how long will it take after drinking alcohol for it to be legal to drive again?

- A 1 hour
- B 2.5 hours
- C 3 hours
- D 3.5 hours



26. In an experiment to determine the weight loss from different leaf surfaces, four leaves of equal surface area were taken from a leafy shoot of a well-watered plant. Four leaves were treated as follows:

Leaf	Treatment administered
1	Both surfaces were smeared with vaseline
2	Only the upper surface vaseline
3	Only the lower surface was smeared with vaseline
4	Neither surface was smeared with vaseline

The leaves were weighed and left for 48 hours, after which they were reweighed.

Which treatment resulted in the greatest loss in mass in ascending order?

- A 1, 2, 4, 3
- B 1, 3, 2, 4
- C 2, 4, 3, 1
- D 3, 4, 1, 2
27. Which statement correctly describes genetically modified foods (GMF)?
- A foods that have been produced from plants and animals grown under laboratory conditions.
- B foods produced from plants and animals that have been sprayed with chemicals to destroy predators.
- C foods produced from plants and animals that have little nutritional value.
- D foods produced from plants and animals that have been given genes from a different species.

28. Plants in habitats with limited water availability have adaptations to reduce the rate of transpiration.

Which row correctly describes adaptations of a plant that will reduce the rate of transpiration?

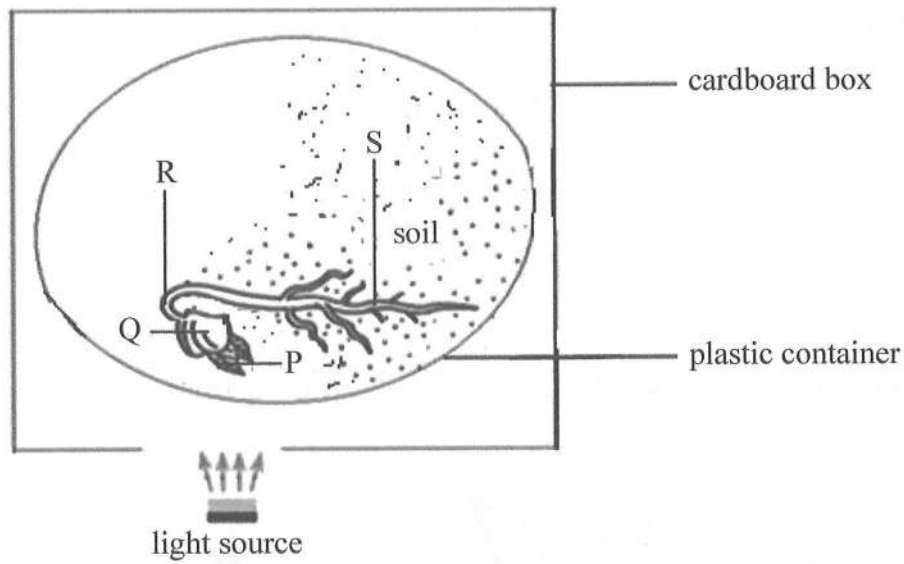
	plant	adaptation
A	cactus	broad flat leaves with many stomata
B	mangrove	leaves with thick waxy cuticle with few stomata
C	rhizome	thick stems with spike-like leaves
D	water hyacinth	rolled leaves with interlocking hairs

29. Which row correctly defines homeostasis and osmoregulation?

	homeostasis	osmoregulation
A	The maintenance of the correct pH in the blood.	The secretion of water by cells.
B	The regulation of internal conditions in the body.	The regulation of water in the body.
C	The removal of excess materials from the body.	The maintaining of body temperature of 37°C.
D	The regulation of the temperature of the body.	The stimulation of endocrine glands.



30. The diagram shows a bean seedling growing in a horizontal position.



Where is there a collection of auxins that cause the plumule to bend towards light?

- A P
- B Q
- C R
- D S
31. Which term describes the growth of a plant root towards gravity?
- A negative geotropism
- B positive geotropism
- C negative phototropism
- D positive phototropism

32. Which of the following is true of a germinating seed?

- A The cotyledons protect the internal parts of a seed.
- B The embryo is made of the plumule and radicle.
- C The micropyle emerges first to absorb water.
- D The testa contains the stored food.

33. Which of the following seeds is dispersed by mechanical explosion?



A



B



C



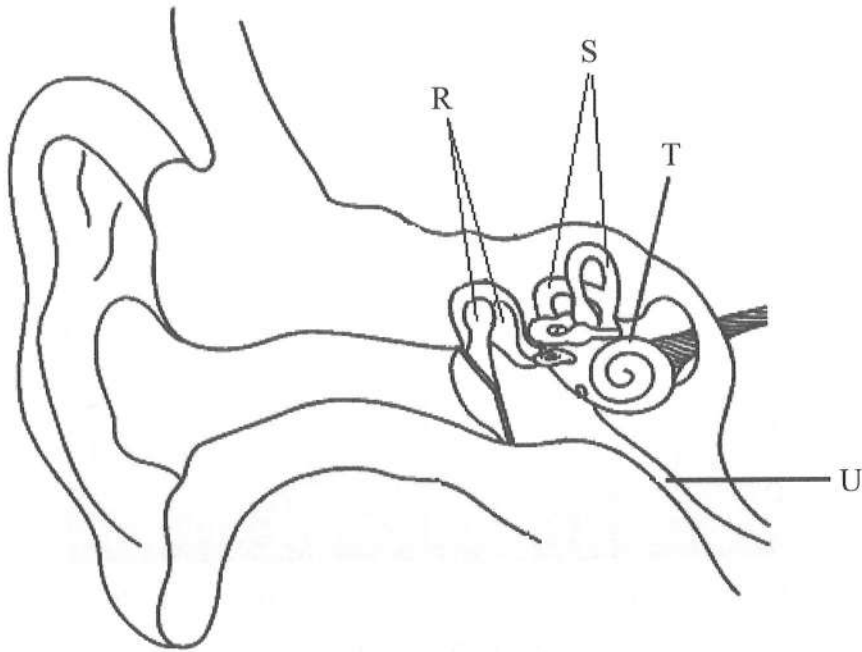
D

34. Which sequence correctly shows what happens for a sound to be heard?

- A sound waves in the air → outer ear → tympanic membrane → middle ear → round window → inner ear → brain
- B sound waves in the air → oval window → inner ear → tympanic membrane → middle ear → brain
- C sound waves in the air → oval window → inner ear → tympanic membrane → outer ear → brain
- D sound waves → tympanic membrane → middle ear → oval window → inner ear → brain



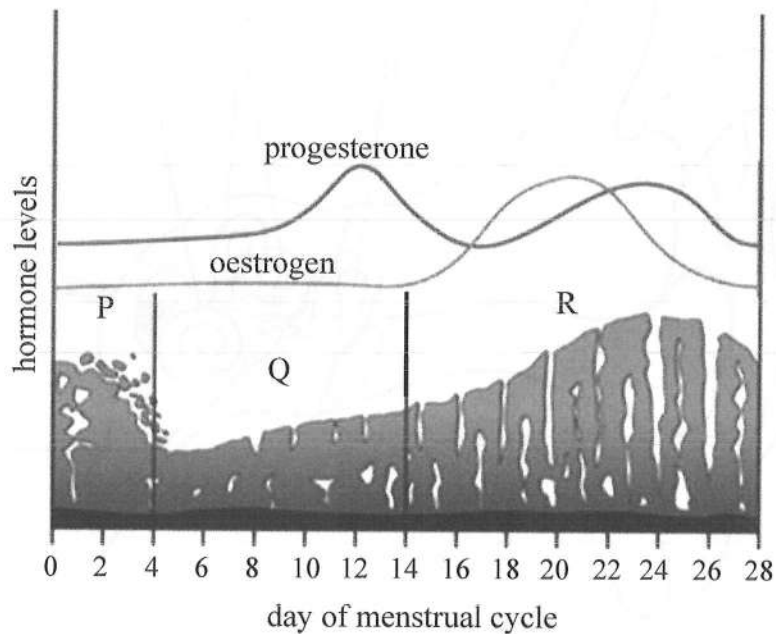
35. The diagram shows a cross-section of the human ear.



Which labelled structure helps to amplify the vibrations in the ear?

- A R
- B S
- C T
- D U

36. The diagram shows changes in hormone levels and the thickness of the uterus lining during the menstrual cycle.

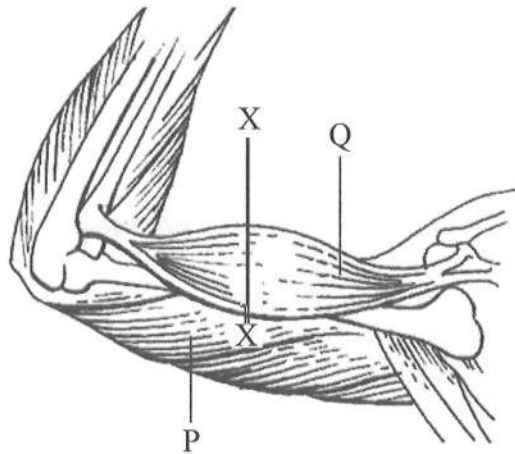


Which stage of the menstrual cycle is shown by the part labelled P?

- A A new lining is built up on the uterine wall and ovulation occurs.
- B If a fertilised egg is not received, the uterine lining begins to break down.
- C The lining of the uterus leaves the uterine wall and menstruation begins.
- D The uterus is ready to receive a fertilised egg.



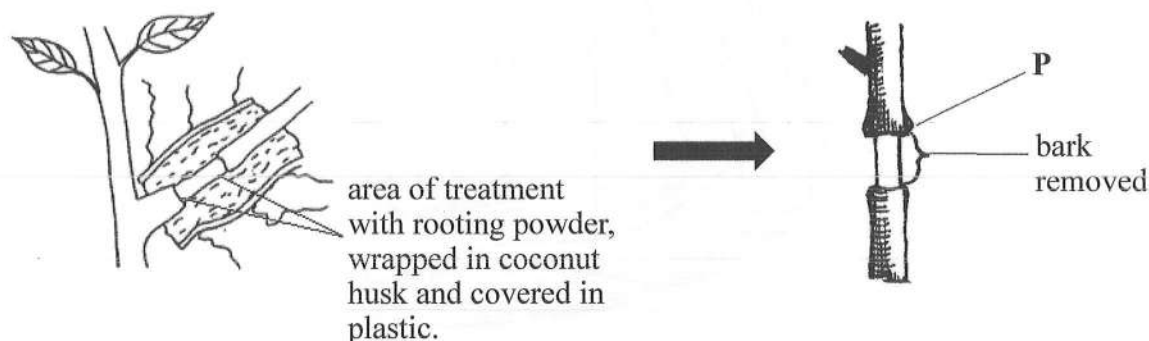
37. The diagram below shows the two muscles labelled P and Q in the human upper arm.



What would be the effect of severing the muscle Q across line across the line X-X?

- A** The elbow cannot be flexed.
- B** The elbow cannot be extended.
- C** The muscle at P cannot contract.
- D** The muscle at P cannot relax.

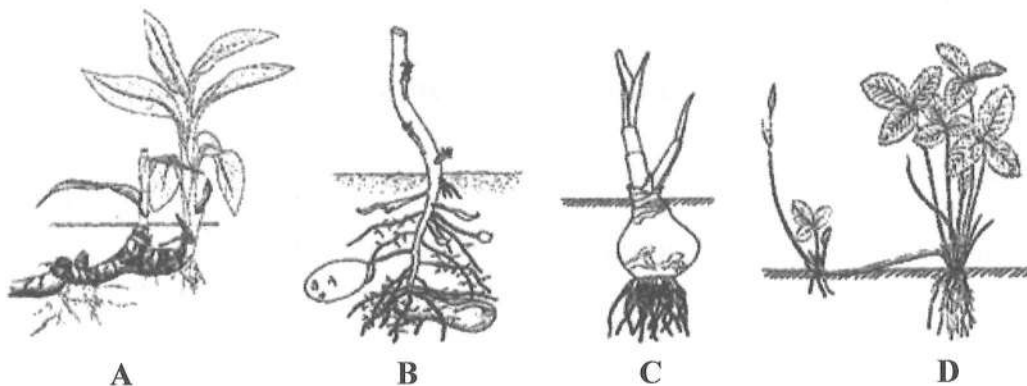
The first diagram shows part of a stem of a woody plant that has had a ring of bark removed. The damaged area has been wrapped with coconut husk. The second diagram shows the appearance of the damaged area after several months. Questions 38 and 39 refer to the diagram.



38. What is the main function of the husk?
- A to prevent the entry of carbon dioxide
 - B to prevent entry of light
 - C to prevent the loss of oxygen
 - D to prevent the loss of water
39. Which processes must have occurred to explain the changes in appearance of part P?
- A transport of water from the leaves and translocation from the leaves
 - B transport of water from the leaves and translocation from the roots
 - C transport of water from the roots and translocation from the leaves
 - D transport of water from the roots and translocation from the roots
40. Which type of cell division results in the formation of haploid daughter cells from a diploid cell?
- A budding
 - B fission
 - C meiosis
 - D mitosis



41. Which diagram shows a natural method of asexual reproduction that involves the use of a rhizome?



42. Which hormones are present in birth control pills to prevent fertilisation?

- A follicle stimulating hormone (FSH) and progesterone
- B luteinizing hormone (LH) and follicle stimulating hormone (FSH)
- C luteinizing hormone (LH) and oestrogen
- D oestrogen and progesterone

43. The table shows the number of persons, in a section of New Providence, who used various methods of contraception between 2015 and 2018.

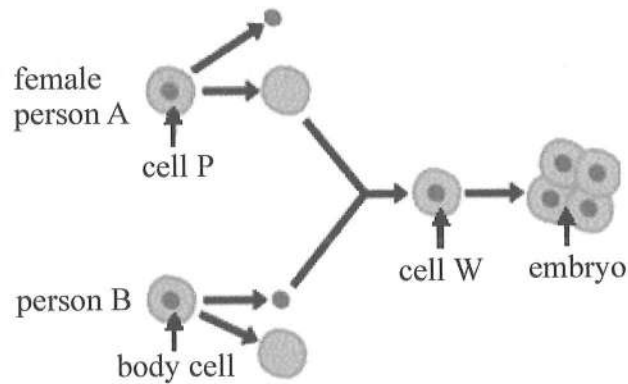
	2015	2016	2017	2018
diaphragm	320	516	616	700
condom	8 000	10 260	15 350	20 500
spermicide	859	530	400	400
birth control pill	5 300	6 000	6 500	7 500

Which factor could explain the figures for the use of condoms?

- A decrease in the availability of the pill
 - B decrease in sexual activity
 - C increase in the cost of contraceptives
 - D increase in awareness about sexually transmitted diseases
44. What is the main function of the scrotum?
- A to assist sperm cells to travel quickly into the vagina
 - B to allow sperm cells to develop in cooler temperatures
 - C to provide extra storage space for sperm cells
 - D to transport sperm cells from the vas deferens to the urethra
45. Which is an example of discontinuous variation within the human species?
- A blood group
 - B hair colour
 - C skin colour
 - D mass



46. The diagram shows a method that could be used in the future to produce a human.



Which method of reproduction is shown in the diagram above?

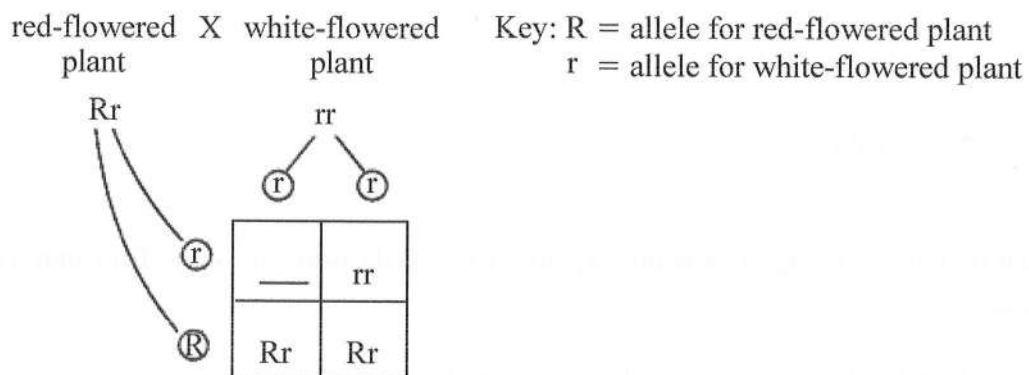
- A adult cell cloning
- B embryo transplant
- C sexual reproduction
- D tissue culture
47. Which of the following statements explains why seeds from the same fruit may be genetically different?
- A Fertilisation often causes the mutation of seeds.
- B Pollination causes different chromosome combinations.
- C Seeds grow differently because of environmental conditions.
- D The seeds are active sites of meiosis.
48. Which feature is common to both RNA and DNA molecules?
- A double-stranded helix
- B nitrogenous bases that include uracil
- C phosphate group attached to a 5-carbon sugar
- D single helix strand

49. Two black coated rabbits, heterozygous for the gene controlling coat colour were mated, and 12 offsprings were produced.

Which is the expected number of offspring in this litter with the dominant phenotype for coat colour?

- A 3
- B 6
- C 9
- D 12

50. The Punnett square diagram shows the possible genotypes of hibiscus flowers resulting from a cross between a red-flowered hibiscus plant and a white-flowered hibiscus plant.



What is the missing genotype from the Punnett square?

- A RR
- B Rr
- C rR
- D rr



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3009/2

BGCSE

School Number	Candidate Number
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BIOLOGY

PAPER 2 3009/2

Monday

19 MAY 2025

10:30 a.m.–12 noon
(1 hr. 30 mins.)

MINISTRY OF EDUCATION NATIONAL EXAMINATIONS

BAHAMAS GENERAL CERTIFICATE OF SECONDARY EDUCATION

INSTRUCTIONS AND INFORMATION FOR CANDIDATES

Do not open this booklet until you are told to do so.

Write your school number, candidate number, surname, name and initials in the spaces provided above.

Answer **ALL** questions on this paper.

Read each question carefully and make sure you know what you have been asked to do before starting your answer.

Confine your answer to the lines following each question. The mark for each part-question is given in brackets [].

Calculators are permitted. However, **NO** graphing calculators are allowed.

For Examiner's Use	
1	
2	
3	
4	
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7	
8	
TOTAL	

This question paper consists of 17 printed pages and 3 blank pages.

1. Diagram X and diagram Y represent some of the characteristics of living organisms.

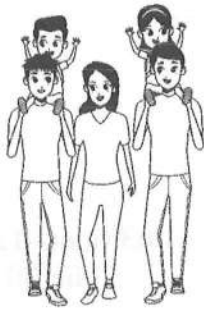


diagram X



diagram Y

- (a) (i) One of the characteristics of living organisms shown in both diagrams is reproduction.
- Name **ONE** other characteristic of living organisms shown in both diagrams.
- _____ [1]
- (ii) Diagram X and diagram Y represent examples of the two main types of reproduction.
- Name the **TWO** main types of reproduction represented in diagram X and diagram Y.
- _____ [2]
- (iii) Name the **TWO** types of specialised cells that are needed to carry out the type of reproduction represented in diagram X.
- _____ [2]
- (b) Plants need light in order to make complex organic compounds from simple molecules.
- (i) Name the process that needs light and which plants use to make complex organic compounds from simple molecules.
- _____ [1]



- (ii) Name the characteristic of living organisms that includes the process named in (b) (i).

_____ [1]

- (iii) Describe a difference between the way in which the organisms in diagram X obtain their food and the way in which the organisms in diagram Y obtain their food.

_____ [1]

- (iv) State how organisms in diagram X are adapted to their mode of feeding.

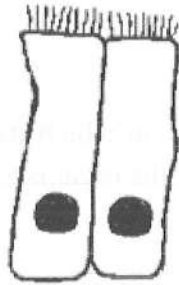
_____ [1]

- (v) State the term used for an animal that gets its energy by eating plants and animals.

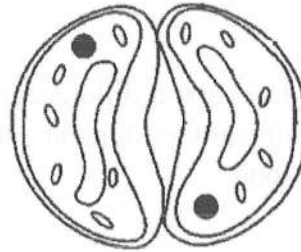
_____ [1]

TOTAL MARKS [10]

2. The diagram below shows two different types of cells, X and Y.



X



Y

- (a) Identify cell X and cell Y.

X _____ [1]

Y _____ [1]

- (b) Describe a feature and a function of each of the two types of cell, X and Y.

(i) feature of X _____
_____ [1]

function of X _____
_____ [1]

(ii) feature of Y _____
_____ [1]

function of Y _____
_____ [1]



- (c) For each of the two types of cells, X and Y, state the name of an organ where the cell type can be found.

organ containing X _____ [1]

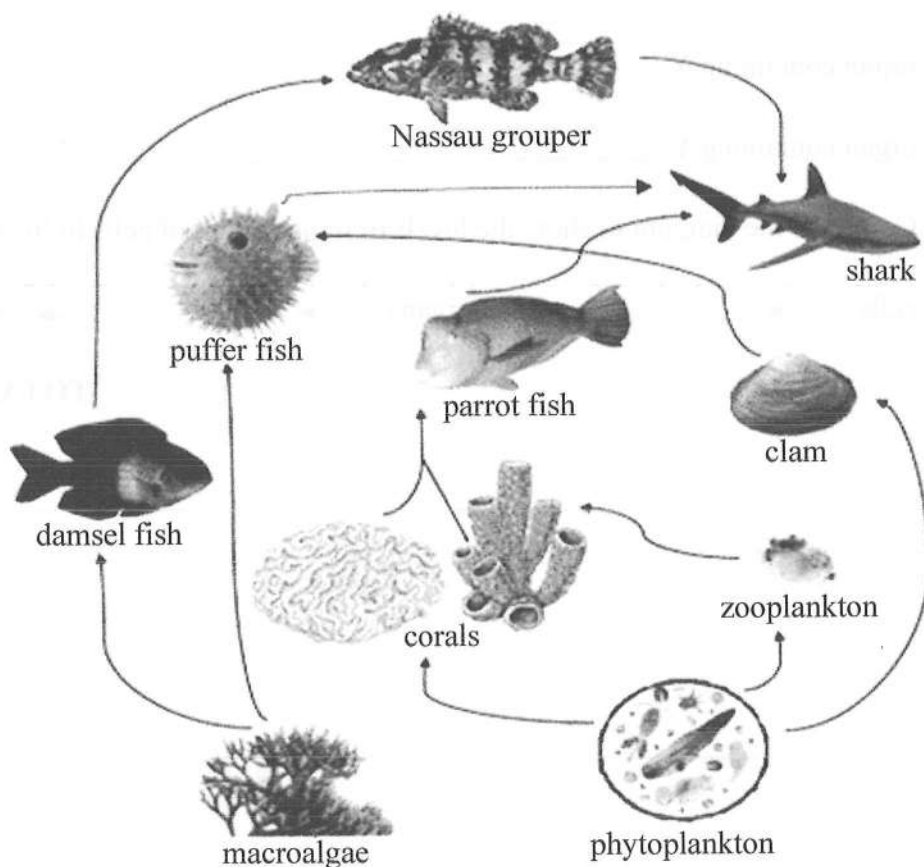
organ containing Y _____ [1]

- (d) Complete the diagram to show the levels of organisation of cells in living organisms.

cells → _____ → organs → _____ → organisms [2]

TOTAL MARKS [10]

3. The illustration below represents a coral reef ecosystem in The Bahamas.



- (a) (i) State the main source of energy for this ecosystem.
- _____ [1]
- (ii) Name the type of energy that is passed down from one organism to another in the food web.
- _____ [1]
- (b) Describe what a food web represents.
- _____ [1]
- (c) State the name of **ONE** producer in this food web.
- _____ [1]



- (d) Suggest, with a reason, what would happen to the parrot fish population if the shark population became extinct.

Suggestion _____
_____ [1]

Reason _____
_____ [1]

- (e) (i) Identify an invasive species that has threatened this ecosystem in The Bahamas.
_____ [1]

- (ii) Suggest **ONE** negative effect the invasive species named in (e)(i) would have in this ecosystem.
_____ [1]

- (f) Use the information in the food web of a coral reef ecosystem to draw a food chain, include only the following organisms: clam, puffer fish, phytoplankton and shark.

[2]

TOTAL MARKS [10]

4. The diagrams below show fishing gears:



figure 1

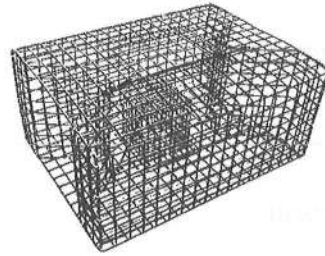


figure 2

(a) Identify the fishing gears in the diagrams above.

figure 1: _____ [1]

figure 2: _____ [1]

(b) State **ONE** advantage and **ONE** disadvantage of using each of the fishing gear above.

advantage:

figure 1: _____
_____ [1]

figure 2: _____
_____ [1]

disadvantage:

figure 1: _____
_____ [1]

figure 2: _____
_____ [1]



- (c) State the closed season period for a named marine organism.

name of marine organism _____ [1]

closed season period _____ [1]

- (d) Identify **ONE** illegal fishing method practised in The Bahamas.

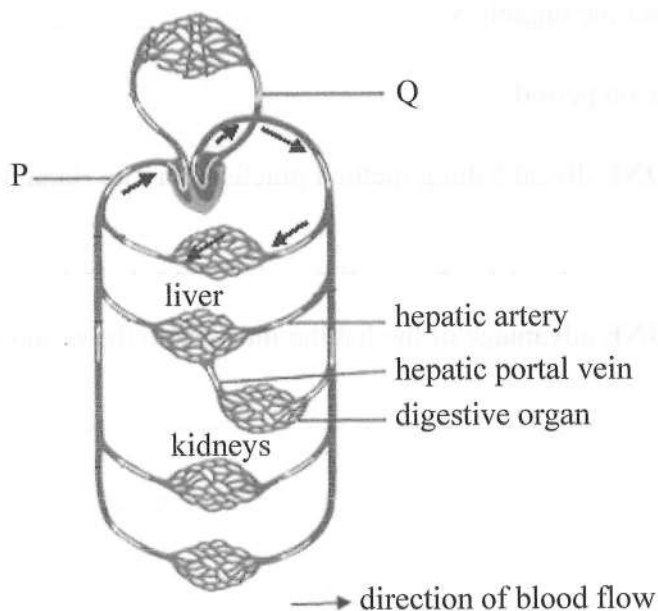
_____ [1]

- (e) Suggest **ONE** advantage of the fishing industry to the economy of The Bahamas.

_____ [1]

TOTAL MARKS [10]

5. The diagram below represents the flow of blood throughout the body.



- (a) Explain what is meant by the term double circulation.

_____ [2]

- (b) Name the blood vessels labelled P and Q in the above diagram.

P _____

Q _____ [2]

- (c) Describe how the composition of blood changes as blood flows through the lungs.

_____ [2]

- (d) State the name of the type of circulation that describes the flow of blood:

- (i) from the right ventricle to the lungs and back to the left auricle/atrium.

_____ [1]

- (ii) from the left ventricle to the body and back to the right auricle/atrium.

_____ [1]



- (e) Name and describe a disease caused by the long term consumption of a diet high in fat.

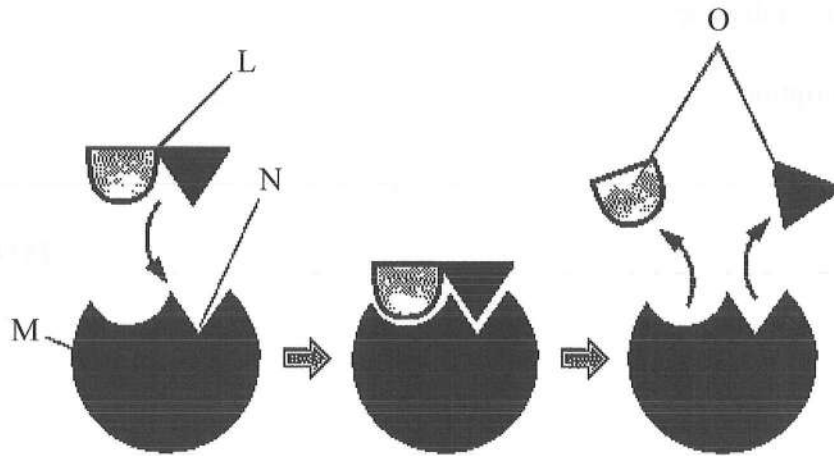
name of disease _____ [1]

description _____

_____ [1]

TOTAL MARKS [10]

6. The diagram shows how enzymes work.



(a) Name the parts labelled L and M.

L: _____

M: _____ [2]

(b) Explain why enzymes can be referred to as “biological catalysts”.

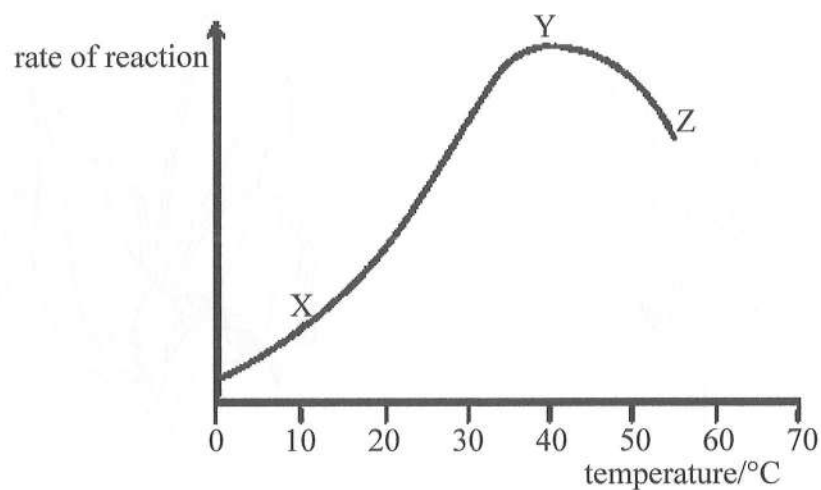
_____ [1]

(c) With reference to L, M, N and O in the diagram, explain how enzymes work.

_____ [2]



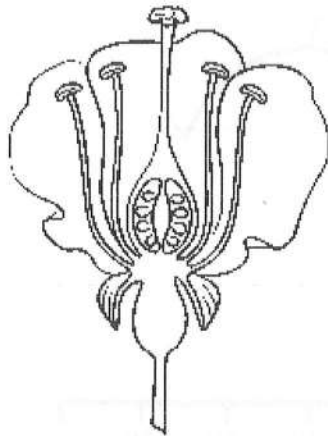
- (d) The graph shows the effect of temperature on the rate of an enzyme-catalysed reaction.



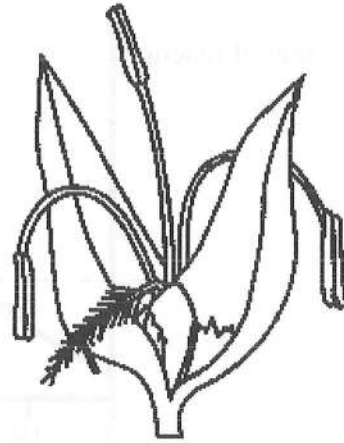
- (i) Describe **and** explain what is happening between points X to Y.
- _____
- _____ [2]
- (ii) Describe **and** explain what is happening between points Y to Z.
- _____
- _____ [2]
- (e) Name a factor, other than temperature, that can affect the activity of an enzyme.
- _____ [1]

TOTAL MARKS [10]

7. The diagram below shows two different types of flowers.



flower G



flower H

- (a) (i) Identify the method of pollination for flower G and flower H.
- flower G _____
- flower H _____ [2]
- (ii) State **TWO** visible differences between flower G and flower H, based on their method of pollination.
- _____
- _____
- _____ [2]
- (iii) State how it is possible for flower H to be self-pollinated.
- _____
- _____
- _____ [1]



- (b) (i) Describe the process of fertilisation that occurs after pollination in flower G.

[3]

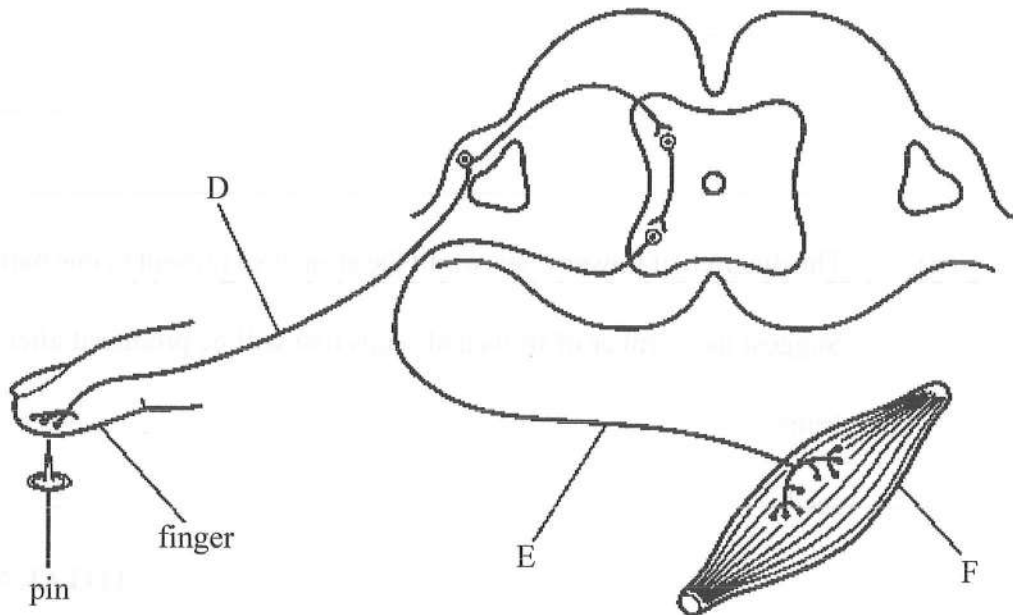
- (ii) The diagram of flower G shows all the structures present in one half of the flower.
Suggest the number of fruits and seeds that will be produced after fertilisation.

fruits _____

seeds _____ [2]

TOTAL MARKS [10]

8. The diagram below shows a reflex arc.



- (a) State the importance of reflex actions to human beings.

_____ [1]

- (b) (i) Give **TWO** structural differences between structures D and E.

_____ [2]

- (ii) Describe the function of structure D.

_____ [1]



(c) (i) Using the letter **X**, label a synapse on the diagram. [1]

(ii) State the function of a synapse.

_____ [1]

(iii) Name a location, (other than the location shown in the diagram), where a synapse can be found.

_____ [1]

(d) Describe the pathway shown in the diagram along which a nerve impulse is passed when the skin is pricked by a pin.

_____ [2]

(e) Suggest **ONE** reason that could explain why the speed of transmission of a nerve impulse in an individual neurone is slower than the speed of transmission in other neurones within the same person.

_____ [1]

TOTAL MARKS [10]

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3009/3

BGCSE

School Number	Candidate Number
Surname, Name and Initials	

BIOLOGY

PAPER 3 3009/3

Thursday

22 MAY 2025

12:30 p.m.–2:00 p.m.
(1 hr. 30 mins.)

MINISTRY OF EDUCATION NATIONAL EXAMINATIONS

BAHAMAS GENERAL CERTIFICATE OF SECONDARY EDUCATION

INSTRUCTIONS AND INFORMATION FOR CANDIDATES

Do not open this booklet until you are told to do so.

Write your school number, candidate number, surname and initials in the spaces provided above.

Answer **ALL** questions in **Section A** in the space provided. Candidates are advised to spend no more than **35 minutes** on **Section A**.

Answer **TWO** out of **THREE** questions in **Section B**, the answer lines are provided at the end of the Question Paper.

The mark for each part question is given in brackets [].

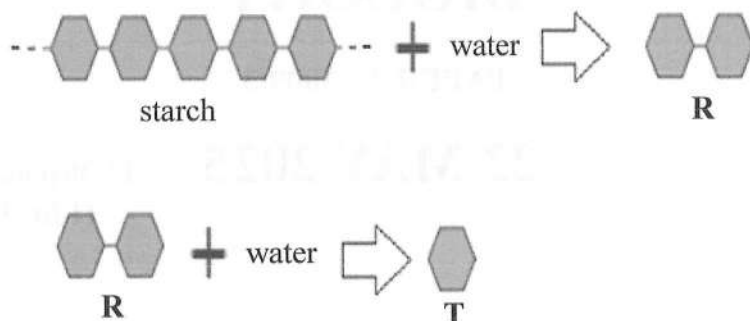
Calculators are permitted. However, **NO** graphing calculators are allowed.

For Examiner's Use	
1	
2	
3	
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7	
TOTAL	

This question paper consists of 22 printed pages and 2 blank pages.

SECTION A

1. The diagram below shows a chemical process acting on a molecule of starch.



- (a) Explain the process occurring in the diagram above.

_____ [2]

- (b) Name the molecules labelled **R** and **T**.

R: _____ [1]

T: _____ [1]

- (c) State the name of an enzyme that is used in the reaction that changes **R** into **T**.

_____ [1]

- (d) Starch is one type of carbohydrate.

Name another type of carbohydrate found in the walls of plant cells and state its function.

type of carbohydrate _____ [1]

function _____ [1]



- (e) Explain why sugars are more easily transported around the body than starches.

_____ [2]

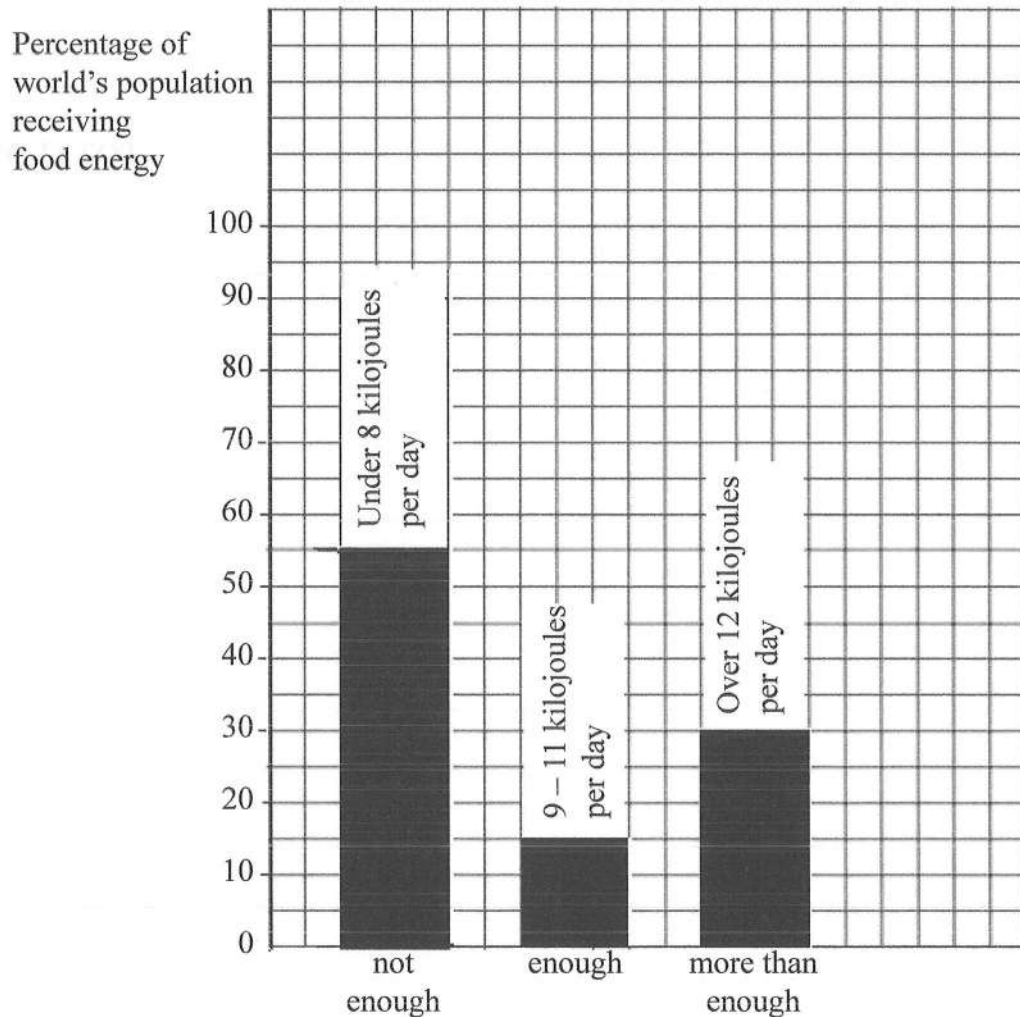
- (f) State the name of the organ in the human body to which molecule **T** is transported for storage after being absorbed in the small intestine.

_____ [1]

TOTAL MARKS [10]

2. The bar chart shows the percentage of the world's population in each of the three groups:

- People whose diets provide under 8 000 kilojoules per day.
- People whose diets provide 9 000 – 11 000 kilojoules per day.
- People whose diets provide over 12 000 kilojoules per day.



- (a) (i) Calculate the difference in the percentage of the world's population whose diets provide **under 8 000 kilojoules per day** and the world's population whose diets provide **over 12 000 kilojoules per day**.

[1]



- (ii) State the **minimum** difference in the energy intake per day for people whose diets did **not provide enough energy** and people whose diets provide **more than enough** energy.

_____ [1]

- (iii) People whose diets provide **more than enough energy** per day are susceptible to a health condition, which can lead to numerous health problems and diseases.

State the name of this health condition.

_____ [1]

- (b) A mother whose diet is **not providing enough energy** per day is breast-feeding her baby.

- (i) Name a deficiency disease that a breast-fed baby is at risk of developing, if the mother is not receiving sufficient energy and protein in her diet.

_____ [1]

- (ii) Describe **TWO** signs or symptoms of the deficiency disease named in part (b)(i).

_____ [2]

- (c) State **TWO** consequences of climate change that can result in low food production by farmers.

_____ [2]

- (d) In recent years, there has been a significant increase in war and civil unrest in many regions.

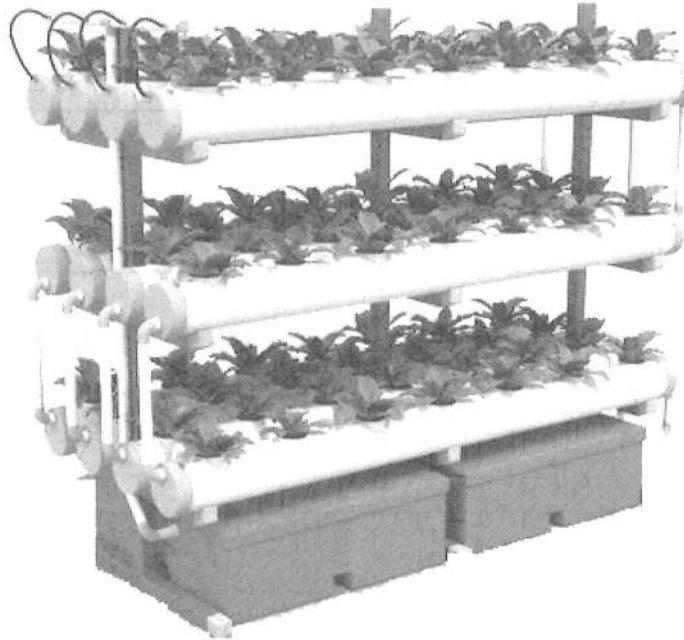
Describe **TWO** ways in which war and civil unrest can reduce the food supplies for populations living in these regions.

[2]

TOTAL MARKS [10]



3. The photograph below represents a modern farming technique known as a vertical hydroponic system.



- (a) Define hydroponics.

_____ [2]

- (b) Outline **TWO** advantages and **TWO** disadvantages of this type of modern farming practice.

- (i) advantages:

1. _____ [1]

2. _____ [1]

- (ii) disadvantages:

1. _____ [1]

2. _____ [1]

- (c) Name **TWO** other modern farming techniques and explain how each have helped to increase crop yields.

1. _____
_____ [1]

2. _____
_____ [1]

- (d) Name and describe the negative effects of **TWO** agricultural practices in The Bahamas.

1. _____
_____ [1]

2. _____
_____ [1]

TOTAL MARKS [10]



4. The diagram shows a frontal view of the human eye in dim light and in bright light. The pupil is not shown.



- (a) (i) Complete the diagrams to show what happens to the pupil when the lighting changes from dim to bright. [1]
- (ii) Explain how the muscles in the iris work together to bring about this reflex response when the light changes from dim to bright.

- (b) Describe what happens to the suspensory ligaments, the ciliary muscles and the lens when the eye changes focus from a distant object to a near object.

(i) Suspensory ligaments: _____ [1]

(ii) Ciliary muscle: _____ [1]

(iii) Lens: _____ [1]

(c) Some eye defects can result in a blurred image if the distance from the eye to the object being viewed is outside a limited range.

(i) State the name of an example of this type of eye defect.

_____ [1]

(ii) State **ONE** possible cause for the eye defect named in (c)(i).

_____ [1]

(iii) State a corrective measure that could be taken to reduce the effect of the eye defect named in (c) (i) and describe the effect of this corrective measure.

corrective measure _____ [1]

effect _____

_____ [1]

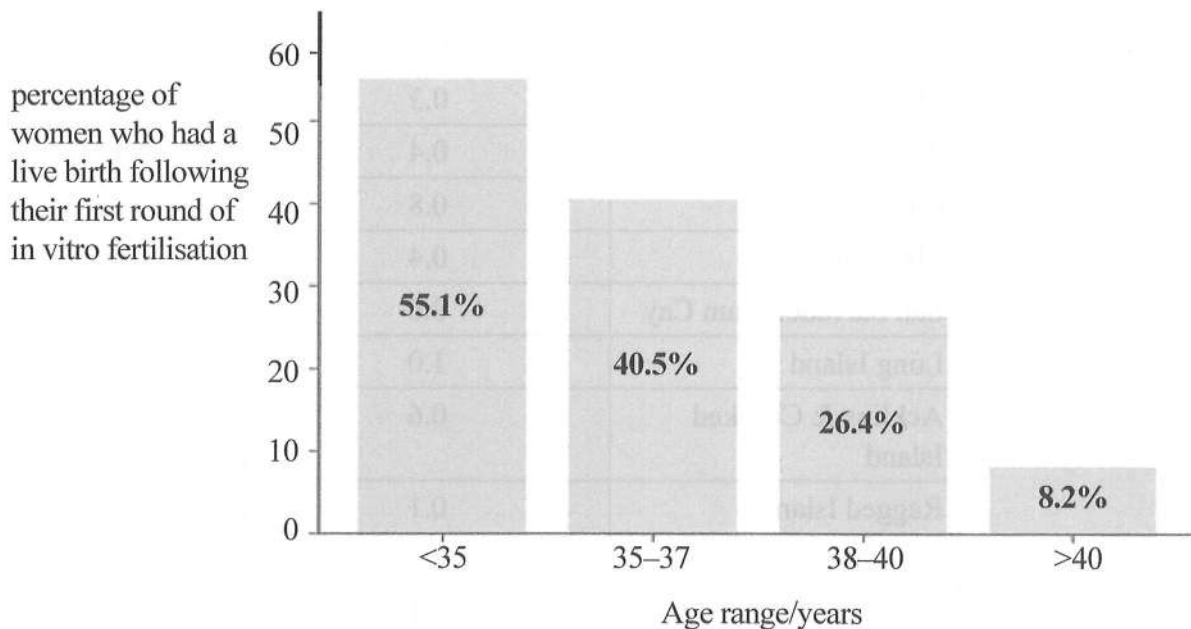
TOTAL MARKS [10]



SECTION B

Answer **TWO** of the three questions in the spaces provided at the back of this question booklet.

5. The bar chart shows, for each age range, the percentage of women who had a live birth following their first round of in vitro fertilisation (IVF).



- (a) Use the bar chart to identify the age group having the most success with IVF treatment. [1]
- (b) Calculate the increase in the percentage of women having live births between age ranges of 35-37 years and age range of 38-40 years. [1]
- (c) Define in vitro fertilisation [IVF] and outline the steps involved in this process. [7]
- (d) Describe **TWO** disadvantages for potential mothers when using IVF. [2]
- (e) Explain **TWO** advantages and **ONE** disadvantage to the use of surrogacy. [3]
- (f) Describe **TWO** ethical concerns of surrogacy. [2]
- (g) Alcohol, cocaine and marijuana, can have adverse effects on the development of the foetus.

Choose **TWO** of these drugs. State the names of the drugs you have chosen and, for each, describe **TWO** adverse effects on the developing foetus. [4]

TOTAL MARKS [20]

[Turn over]

6. The table shows the percentage reduction in area covered by mangroves (wetlands), for each of the different islands in The Bahamas from 2016 to 2022.

Islands of The Bahamas	Percentage reduction area
Grand Bahama	10.6
Abaco	4.4
Bimini	0.1
New Providence	0.3
Eleuthera	0.3
Andros	0.4
Cat Island	0.8
The Exumas	0.4
San Salvador/Rum Cay	0.6
Long Island	1.0
Acklins & Crooked Island	0.6
Ragged Island	0.1
Mayaguana	0.3
Inagua	0.1

The mangrove ecosystem is classified as a wetland.

- (a) (i) Explain the term wetland and give another example. [2]
- (ii) State **THREE** reasons why the mangrove ecosystem is important. [3]
- (b) (i) Name the islands of The Bahamas where the area covered by mangroves has been reduced by between 0.5% and 4.0% from 2016 to 2022. [1]
- (ii) Describe **FOUR** ways by which these mangrove losses could have occurred. [4]
- (iii) Suggest **TWO** ways to reduce or prevent the continued loss of area covered by the mangrove ecosystem in The Bahamas. [2]
- (c) (i) State the name of any **TWO** mangrove plants found in the mangrove ecosystem. [2]
- (ii) Describe **THREE** adaptations of mangrove plants for living in their environment and explain how each adaptation is beneficial to the plant. [6]



TOTAL MARKS [20]

7. This question is about photosynthesis.

- (a) Write a complete chemical equation that represents photosynthesis (include the conditions). [2]
- (b) Name the tissue in the leaf where most photosynthesis takes place and describe how this tissue is adapted for photosynthesis. [3]
- (c) There are many specialised cells in the leaf.
- (i) Name the specialised cell in the leaf that regulates gas exchange and name the structure it forms. [2]
- (ii) Describe how a decrease in water potential of the specialised cells named in (c) (i) affects gas exchange in the leaf. [6]
- (d) An experiment was conducted to determine the effect of light intensity on the rate of photosynthesis of a pond plant *Elodea*. The experiment was repeated to obtain five complete sets of results and the average rate of photosynthesis was calculated at each light intensity.

The results are shown in the table.

Light intensity/lux	Rate of photosynthesis/mm ³ of oxygen per minute					
	Trial 1	Trial 2	Trial 3	Trial 4	Trial 5	Average
2 000	2	1	2	2	3	2
4 000	6	7	5	6	6	6
6 000	17	15	15	16	17	██████
8 000	23	23	22	23	24	23
10 000	37	30	31	28	29	31

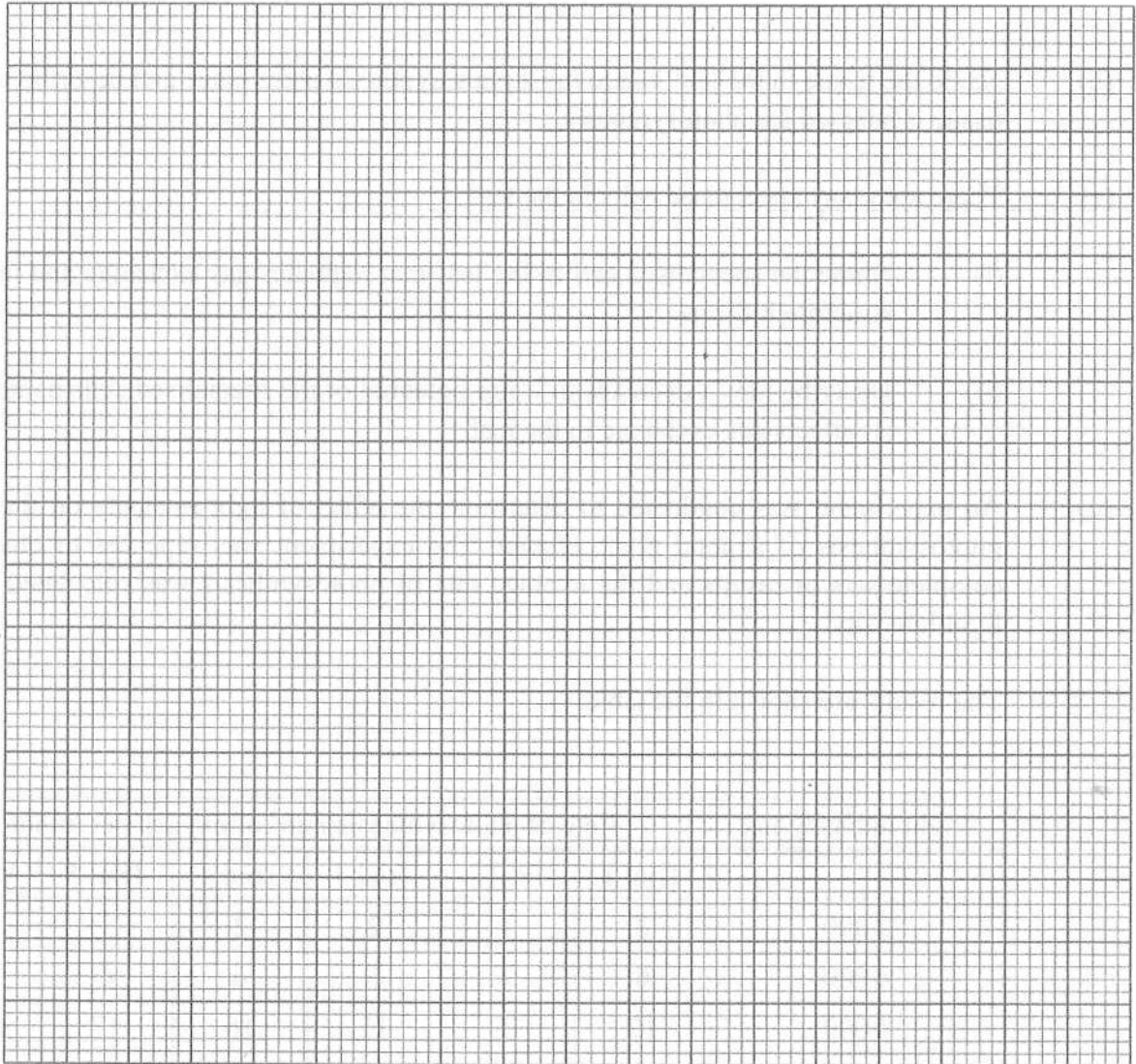
- (i) Calculate the average rate of photosynthesis for the plant when the light intensity is 6 000 lux. [1]
- (ii) On the grid provided on page 14, use the table of results to construct a graph showing the average rate of photosynthesis of the plant at varying light intensities. [4]
- (iii) Describe and explain the results shown in the graph. [2]

TOTAL MARKS [20]

[Turn over]

Question.....

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(4)



Question.....
Write on both sides of the paper

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Question.....

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Question.....

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Question.....

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Question.....

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