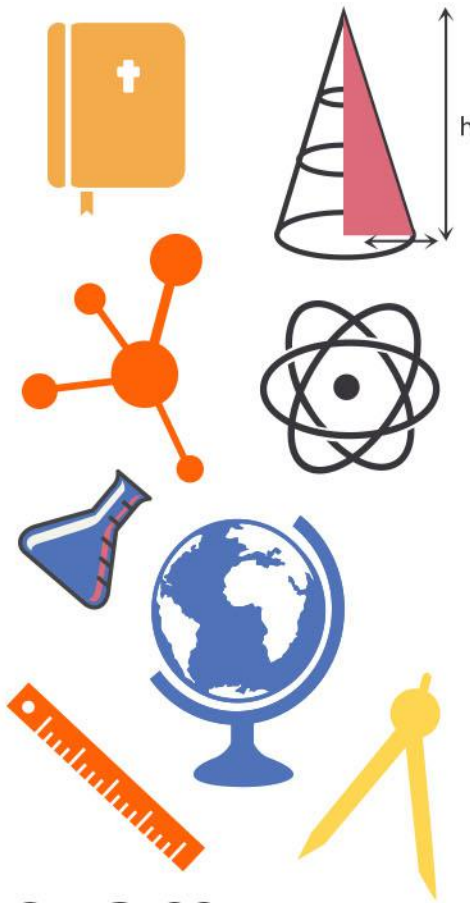
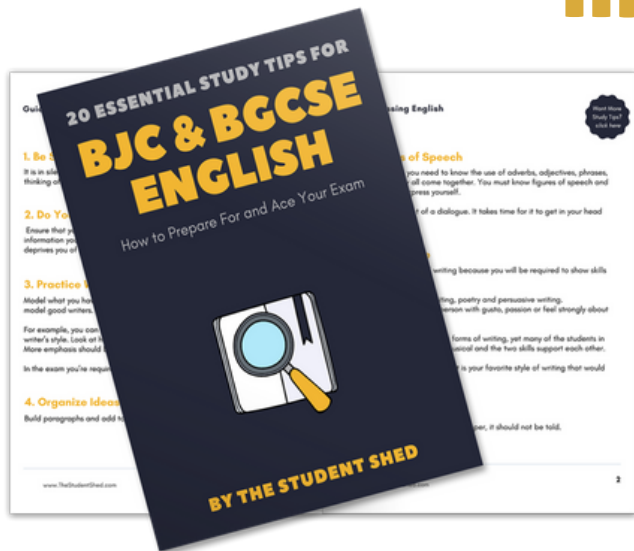


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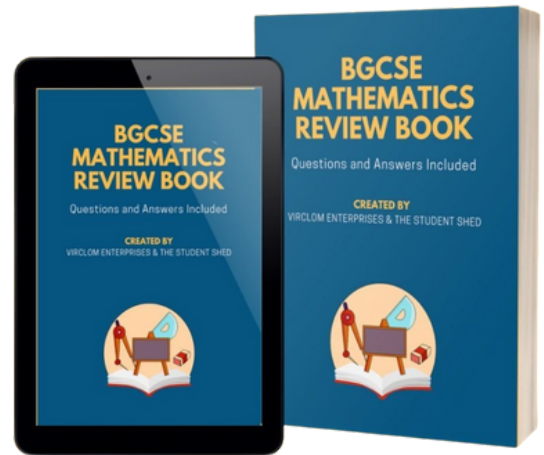


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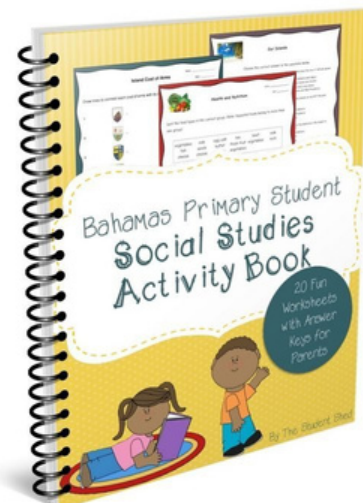
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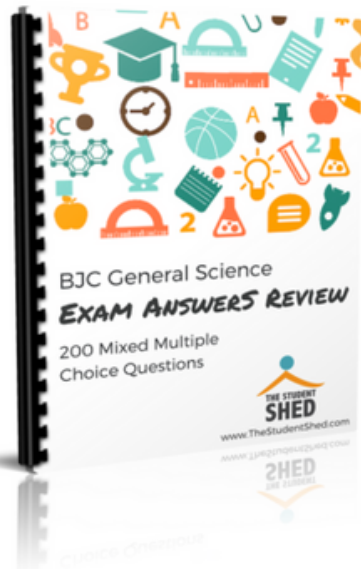
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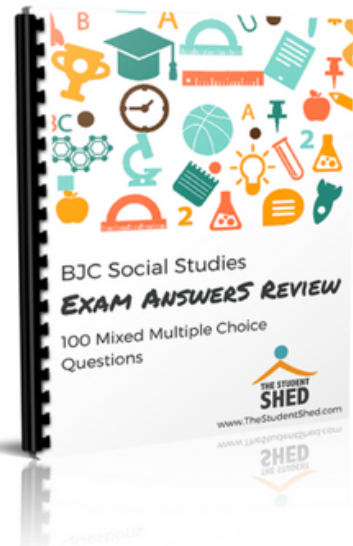
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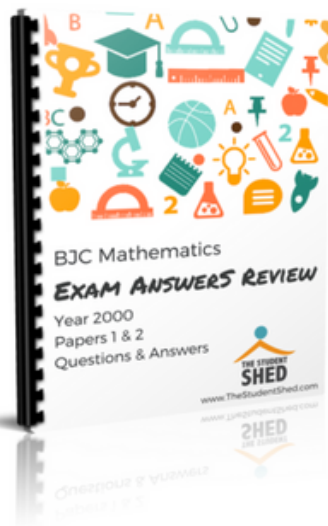
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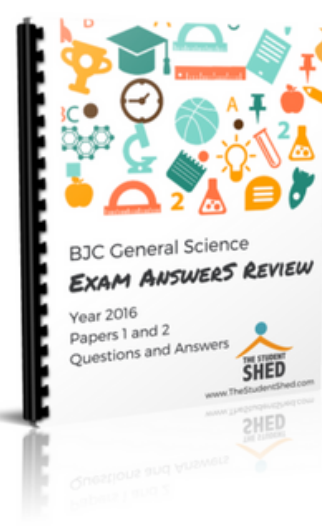
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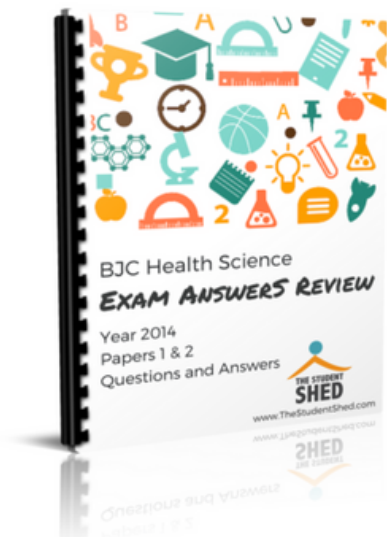
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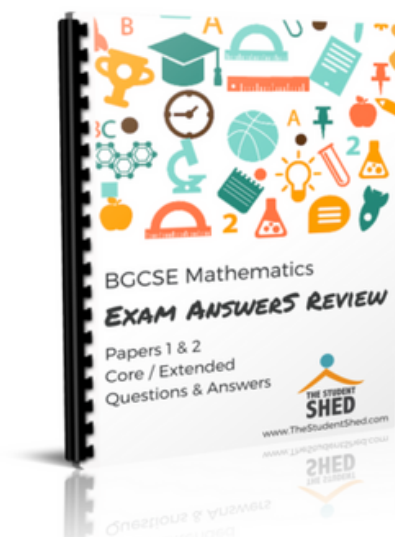
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3009/1

BGCSE

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BIOLOGY

PAPER 1 3009/1

Thursday **17 MAY 2018** 9:00 A.M.–10:15 A.M.

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.

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.

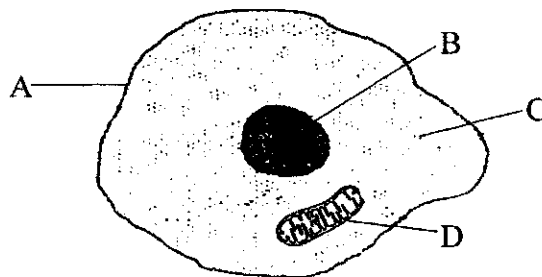


This question paper consists of 19 printed pages and 1 blank page.

1. Which term is used to describe the process by which metabolic wastes are removed from organisms?
 - A assimilation
 - B egestion
 - C excretion
 - D ingestion

2. Which is the correct way for writing the scientific name for the Nassau grouper?
 - A *Epinephelus Striatus*
 - B *Epinephelus striatus*
 - C *epinephelus Striatus*
 - D *epinephelus striatus*

3. The diagram below represents a cell. Which labelled structure is semi-permeable?



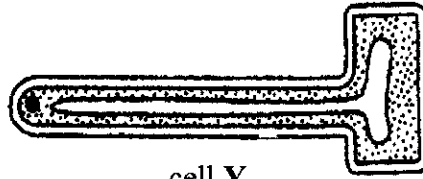
4. Which is found in a plant cell and **not** in an animal cell?
 - A cytoplasm
 - B glycogen granules
 - C nucleus
 - D starch grains



5. The diagrams show two cells, cell X and cell Y.



cell X



cell Y

Which is the correct description of their functions?

	cell X	cell Y
A	kills germs	stores food
B	produces antibodies	absorbs sugar
C	transports oxygen	transports sugar
D	transports oxygen	absorbs water

6. Which of the following is a biotic factor in the environment?

- A plant life
- B rainfall
- C soil type
- D temperature

7. What is the correct biological term for all of the inter-connected feeding relationships in an ecosystem?

- A food chain
- B food interaction
- C food network
- D food web

8. The flow diagram shows one set of feeding relationships in a pond.

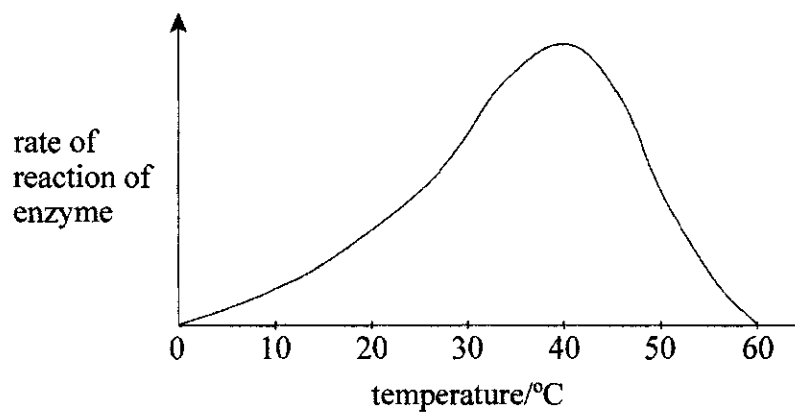
pond weed → mosquito larva → small fish → large fish

At which trophic level is the small fish?

- A 1
 - B 2
 - C 3
 - D 4
9. Which enzyme can be used to speed up the digestion of fat?

- A amylase
- B carbohydrase
- C lipase
- D protease

10. The graph shows the effect of temperature on the rate of enzyme activity in the mouth.



At which temperature (°C) will starch be changed to sugar fastest in the mouth?

- A 10
- B 20
- C 30
- D 40

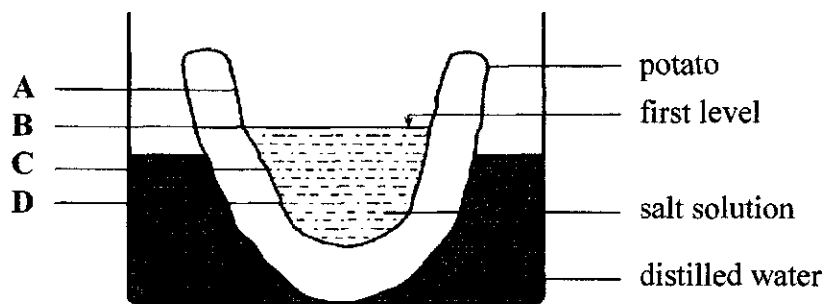


11. Which diagram shows an enzyme-substrate complex?



12. The diagram shows the beginning of an experiment on osmosis.

Which level of salt solution would be shown after 3 hours?



13. Which part of a leaf is correctly matched to its function?

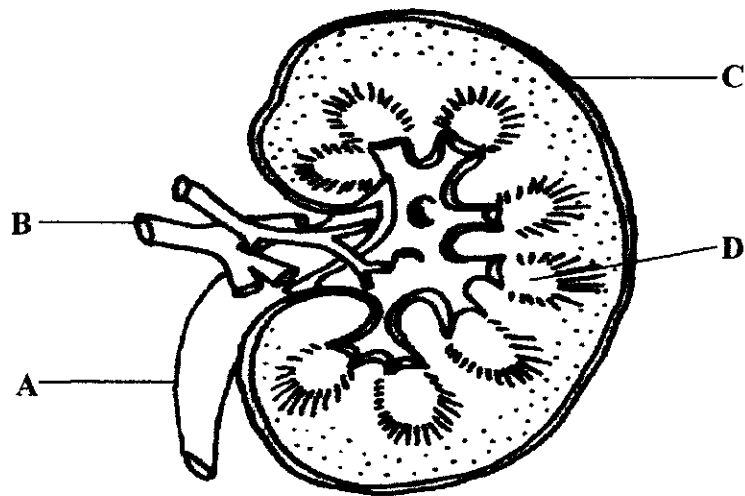
	part of leaf	function
A	palisade mesophyll	contains numerous chloroplasts for photosynthesis
B	spongy mesophyll	tightly packed to absorb carbon dioxide
C	stoma	transports water
D	waxy cuticle	reduces water loss from lower leaf surface

14. Which substance is responsible for giving plants a green colour?

- A auxin
- B chlorophyll
- C starch
- D sucrose

15. The diagram shows the internal structure of a human kidney.

Which structure is responsible for transporting urine to the bladder?



16. Which substance would be present in the urine of a healthy person?

- A amino acid
- B glucose
- C protein
- D urea

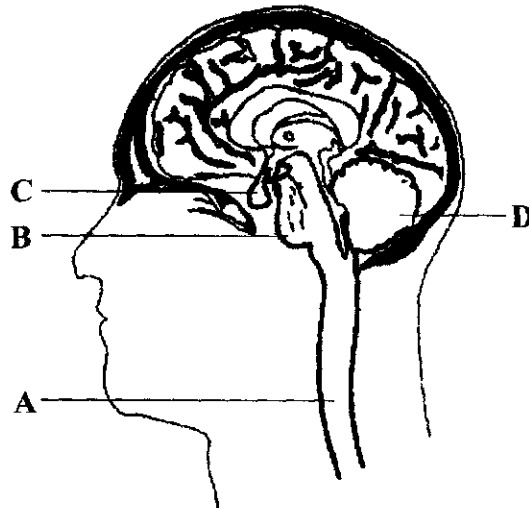
17. What is the name of the fluid that is found at a moveable joint?

- A cartilage
- B serum
- C synovial
- D tissue

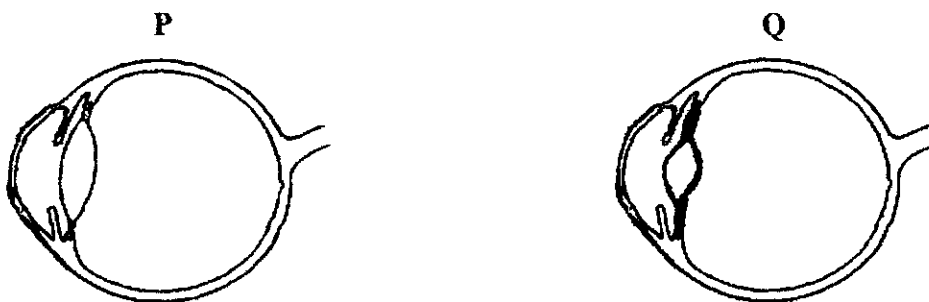


18. The diagram shows a human brain.

Which label on the diagram points to the cerebellum?



19. The diagrams show a section of part of the human eye when looking at an object in **TWO** different positions.

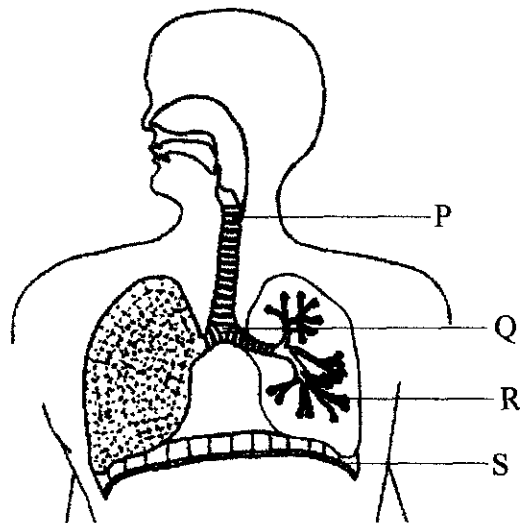


What has happened to cause the change in the lens from P to Q?

The object has moved from:

- A dark to light
- B far to near
- C light to dark
- D near to far

The diagram shows the respiratory system. Use the diagram to answer questions 20 and 21.



20. What is the function of the cartilage rings in tube P?
- A To filter dust and bacteria out of inhaled air.
 - B To force air out of the lungs.
 - C To prevent the collapse of the tube.
 - D To protect the blood vessels supplying the lungs.
21. Which labelled structure shows where gaseous exchange takes place?
- A P
 - B Q
 - C R
 - D S

22. Which row shows the correct composition of expired air?

	oxygen %	nitrogen %	carbon dioxide %	water vapour
A	10	79	4	saturated
B	16	79	4	saturated
C	20	79	1	none
D	21	79	0.04	varies

23. A human at complete rest has an energy usage of 4 kJ per minute. Glucose has an energy value of 16 kJ per gram.

How long will 1g of glucose last as a source of energy?

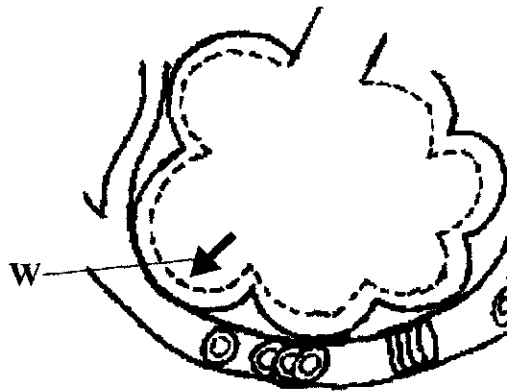
- A** 4 minutes
- B** 12 minutes
- C** 20 minutes
- D** 64 minutes

24. Which of the following are necessary for the process of aerobic respiration to occur?

- A** glucose and carbon dioxide
- B** glucose and oxygen
- C** glucose and sunlight
- D** sunlight and carbon dioxide



25. The diagram represents an alveolus and its blood supply.



What process is represented by arrow W?

- A active transport of carbon dioxide
 - B active transport of oxygen
 - C diffusion of carbon dioxide
 - D diffusion of oxygen
26. Which equation correctly represents anaerobic respiration?
- A carbon dioxide + water \longrightarrow glucose + oxygen
 - B glucose + oxygen \longrightarrow carbon dioxide + water
 - C glucose \longrightarrow ethanol
 - D glucose \longrightarrow carbon dioxide + ethanol

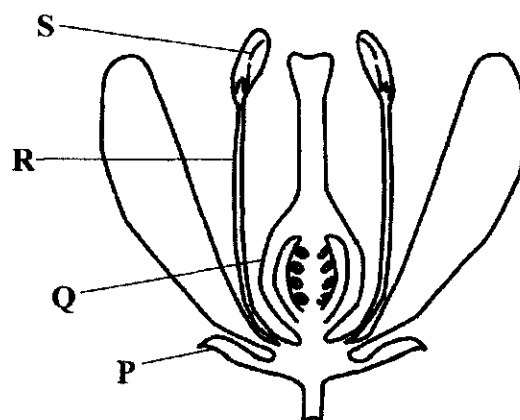


27. Which gas is needed to remove lactic acid made in the muscle during anaerobic respiration?

- A carbon dioxide
- B hydrogen
- C oxygen
- D water vapour

The diagram represents a longitudinal section of a flower. Use the diagram to answer questions 28 and 29.

28. Which part of the flower is responsible for the production of male gametes?

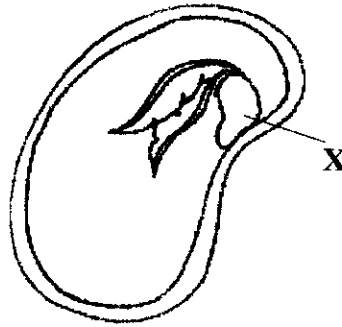


- A P
- B Q
- C R
- D S

29. Which structures make up the stamen?

- A P and Q
- B R and S
- C Q and R
- D P and S

30. The diagram represents a cross-section of a seed.

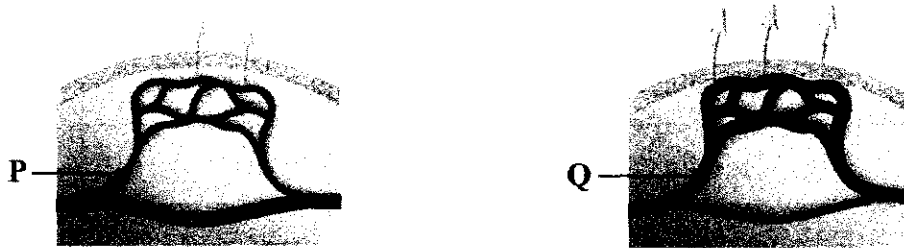


What is the name of the part labelled X?

- A plumule
 - B radicle
 - C testa
 - D zygote
31. In addition to a suitable temperature, what else is necessary for seed germination?
- A carbon dioxide and sunlight
 - B minerals and ions
 - C sunlight only
 - D water and oxygen
32. Which statement best describes homeostasis?
- A lowering of body temperature
 - B maintenance of constant conditions in the body
 - C production of antibodies
 - D removal of toxic wastes from the body



33. The diagram shows the response to changes in temperature of blood vessels near the surface of the skin.



What is responsible for the change from diagram P to diagram Q?

	change	cause of change
A	vasoconstriction	fall in body temperature
B	vasoconstriction	rise in body temperature
C	vasodilation	fall in body temperature
D	vasodilation	rise in body temperature

34. What term describes the growth of a plant root toward gravity?

- A negative geotropism
- B positive geotropism
- C negative phototropism
- D positive phototropism

35. Which hormone is needed for phototropism?

- A adrenaline
- B auxin
- C insulin
- D thyroxine

36. Which gland is **incorrectly** matched with the hormone it produces?

	hormones	glands
A	adrenaline	pituitary gland
B	insulin	pancreas
C	oestrogen	ovary
D	progesterone	ovary

37. Which hormone prepares the body for action in emergency situations?

- A** adrenaline
- B** human growth hormone
- C** insulin
- D** testosterone

38. Which artery carries deoxygenated blood?

- A** coronary artery
- B** hepatic artery
- C** pulmonary artery
- D** renal artery

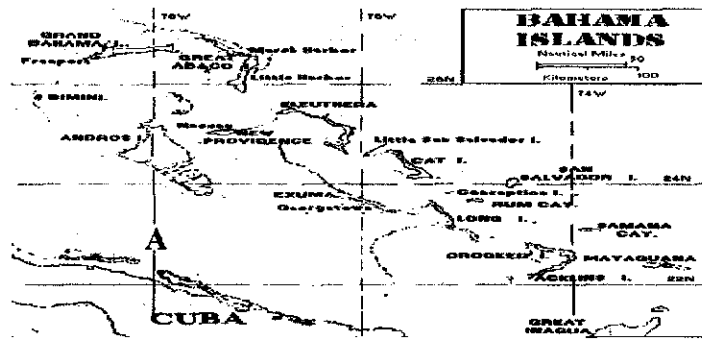
39. What is the function of white blood cells called phagocytes?

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



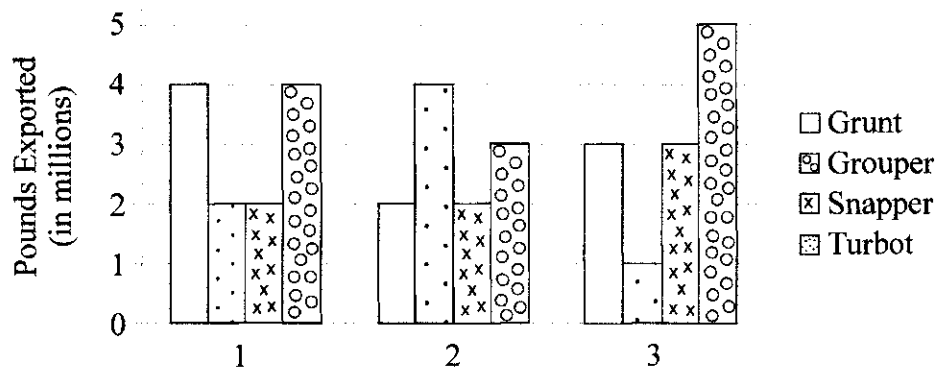
40. Which shows the correct pathway for the circulation of blood in mammals?
- A left ventricle → body → right atrium
 - B left ventricle → lungs → left atrium
 - C right atrium → lungs → left atrium
 - D right atrium → body → left ventricle
41. Which food listed below is **less** likely to contribute towards coronary heart diseases?
- A eggs
 - B french fries
 - C oatmeal
 - D red meat
42. Which marine mollusc is typically found in the Bahamian diet?
- A Nassau grouper
 - B queen conch
 - C spiny lobster
 - D stone crab

43. The diagram represents a map showing the major fishing areas of The Bahamas.



Which fishing area is labelled A?

- A Grand Bahama Bank
B Great Bahama Bank
C Lesser Bahama Bank
D Little Bahama Bank
44. The graph shows the quantity of various reef fish that were exported over a three-year period.

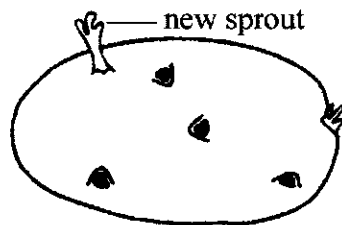


Which fish was exported in the largest quantity over the three years?

- A grouper
B grunt
C snapper
D turbot



45. As a result of mitosis, one parent cell produces which of the following?
- A one daughter cell
 - B two daughter cells
 - C three daughter cells
 - D four daughter cells
46. Which type of cell division results in daughter cells with the haploid number of chromosomes?
- A budding
 - B fission
 - C meiosis
 - D mitosis
47. The diagram shows an Irish potato stem tuber.



Which type of reproduction is shown?

- A binary fission
- B marcotting
- C sexual reproduction
- D vegetative reproduction

48. The diagram represents a birth-control device.

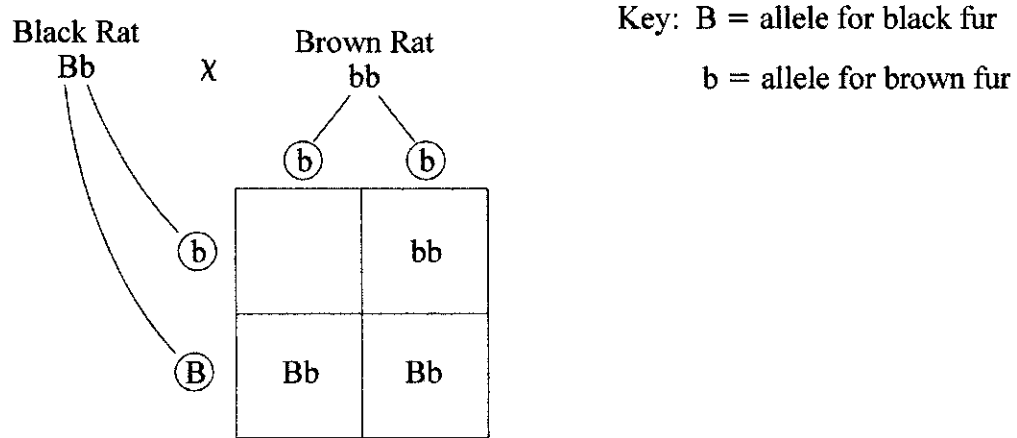


How does this device work?

- A** prevents fertilisation of the egg
 - B** prevents implantation of the egg
 - C** prevents ovulation
 - D** provides a tough coating for the egg
49. Which is an example of discontinuous variation within a population of humans?
- A** blood group
 - B** hair colour
 - C** skin colour
 - D** weight



50. The diagram shows the possible genotypes of offspring from a black fur rat and a brown fur rat. litter of rats resulting from a cross between a black fur rat and a brown fur rat.



Which genotype should be placed in the empty box?

- A BB
- B Bb
- C bB
- D bb

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School Number	Candidate Number
Surname and Initials	

BIOLOGY

PAPER 2 3009/2

Thursday **17 MAY 2018** 10:30 A.M.–12 NOON

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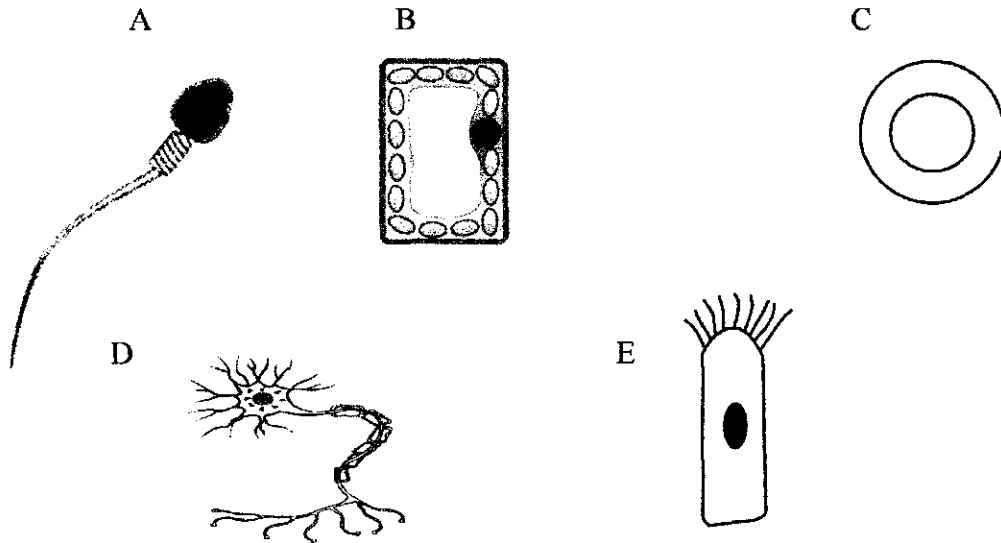
Answer **ALL** questions on this paper. Read each question carefully and make sure you know what you have been asked to do before starting your answer.

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

For Examiner's Use	
1	
2	
3	
4	
5	
6	
7	
8	
TOTAL	

This question paper consists of 15 printed pages and 1 blank page.

1. The diagrams below show some specialised cells. (Diagrams not drawn to scale.)



- (a) Identify the cell which has:

- (i) chloroplasts _____
- (ii) cilia _____
- (iii) no nucleus _____
- (iv) an axon _____ [2]

- (b) State the function of cells A and C and explain **one** adaptation that helps each cell to carry out this function.

Cell A

Function _____

Adaptation _____

_____ [2]

Cell C

Function _____

Adaptation _____

_____ [2]



(c) (i) Name cell **B**.

_____ [1]

(ii) State specifically where in a plant this cell is found.

_____ [1]

(iii) State **TWO** differences, shown on the diagram, between cell **B** and cell **E**.

_____ [2]

TOTAL MARKS [10]



2. The pictures show four images of organisms found in a Bahamian ecosystem.



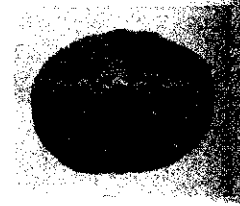
periwinkle



limpet



sea anemone



chiton

(a) (i) Define the term ecosystem.

_____ [1]

(ii) Name the Bahamian ecosystem in which these organisms are found.

_____ [1]

(iii) State **ONE** way in which this ecosystem is of economic importance to The Bahamas.

_____ [1]

(b) Organisms are adapted to survive specific factors.
Complete the table below using only the organisms shown above.

name of organism	factor	adaptation	how the adaptation aids survival
	wave action		prevents physical damage to soft tissue
	exposure to Sun's heat	mucus	

[4]

(c) Identify **TWO** organisms shown above which belong to the same phylum.
Name the phylum and give a reason for your choice.

Organisms _____

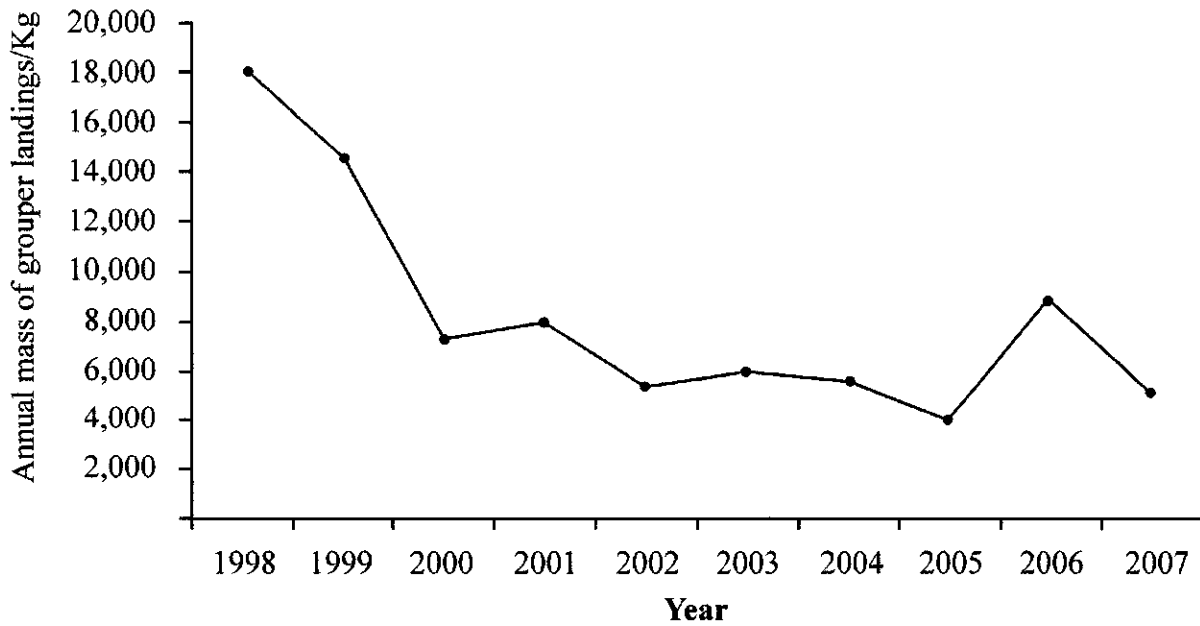
Phylum _____

Reason _____ [3]



TOTAL MARKS [10]

3. The graph shows the mass of Nassau grouper landed in The Bahamas from 1998 to 2007



- (a) (i) From the graph identify the year in which:
1. the most kilograms of grouper were landed.
_____ kilograms
 2. the least kilograms of grouper were landed.
_____ kilograms [2]
- (ii) Calculate the difference in the mass of Nassau grouper landed between the two years identified in (a)(i) above.
_____ kilograms [1]
- (iii) Suggest a reason for the difference indicated by your answer to (a)(i) above.

_____ [1]

- (b) In recent years, a closed season was introduced for the Nassau grouper. A closed season is a period of time when you are not allowed to catch an organism.

- (i) Explain why a closed season is important.

 [2]

- (ii) State another regulation for fishing Nassau grouper.

 [1]

- (c) Name **ONE** other economically important marine species in The Bahamas and state the closed season for the named species.

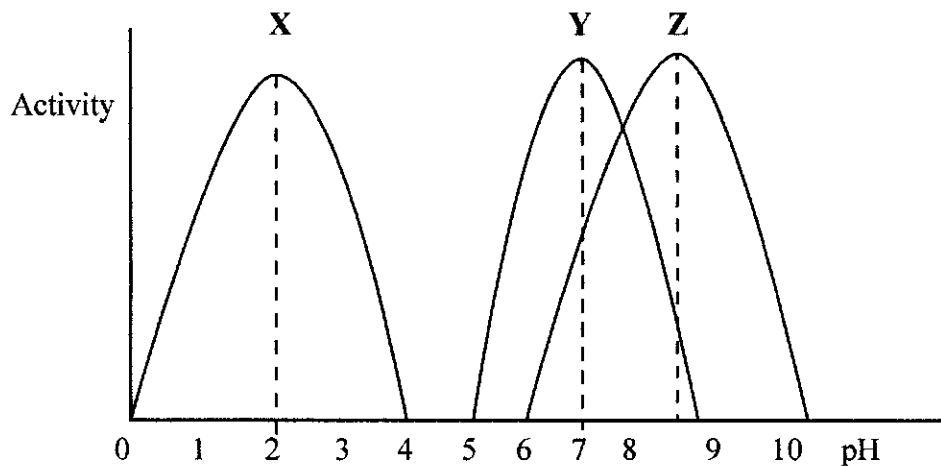
Name _____

Closed season _____ [2]

TOTAL MARKS [9]



4. The graph shows how pH affects three different enzymes, X, Y and Z.



- (a) What are enzymes?

_____ [2]

- (b) (i) Use the graph to help complete the missing information in the table below.

enzyme	optimum pH value	name of enzyme	place where enzyme found in digestive system	nutrient enzyme acts on
X	2	pepsin	_____	protein
Y	_____	amylase	_____	_____
Z	12	_____	small intestine	fat

[5]

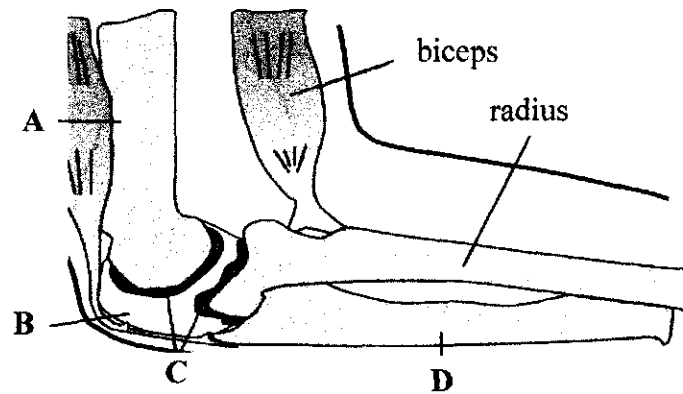
- (ii) From the table identify which one of the enzymes works best in acidic conditions _____ [1]

- (iii) What would be the effect on the activity of enzyme Y if placed in a pH of 10? _____ [1]

- (iv) Which other property of enzymes is shown by referring to the table in (b)(i)? _____ [1]

TOTAL MARKS [10]

5. The diagram shows a synovial joint found in the human body.



- (a) (i) Name the type of synovial joint shown in the diagram.
_____ [1]
- (ii) State a place in the body where this type of joint can be found.
_____ [1]
- (b) (i) Name the parts labelled A, B, C and D.
A _____
B _____
C _____
D _____ [2]
- (ii) State the function of the parts labelled B and C.
B _____
C _____ [2]
- (c) (i) Place an X on the diagram to show the location of a tendon. [1]
- (ii) What is the function of a tendon?
_____ [1]



- (d) (i) Explain how the biceps muscle raises the radius.

 [2]

- (ii) What term describes how the biceps and triceps muscles work in pairs to bring about raising and lowering of the arm?

 [1]

TOTAL MARKS [11]

6. The diagrams represent the human respiratory system and a model of the human respiratory system.

Diagram A

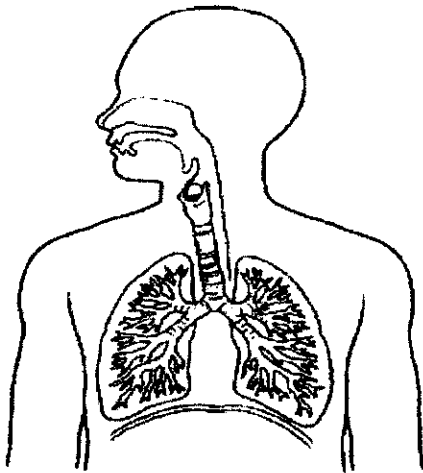
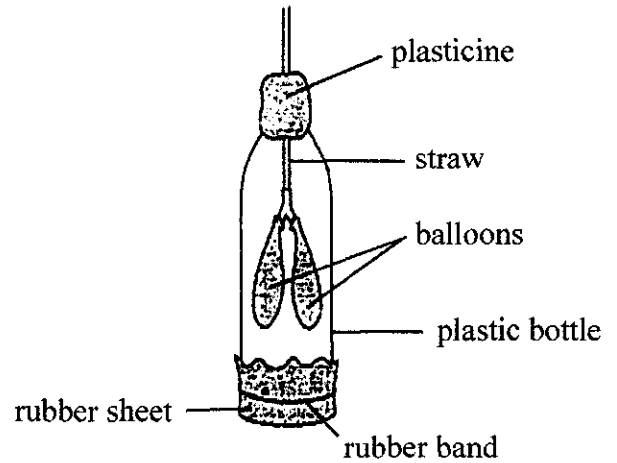


Diagram B



- (a) On Diagram A, draw lines to the following structures and label them.

1. trachea
2. larynx
3. bronchus
4. diaphragm

[4]

- (b) (i) Complete the table below to show what the structures on the model in diagram B represent.

structure in model	structure in respiratory system
balloons	
plastic bottle	
rubber sheet	
straw	

[2]



- (ii) What would be the effect on the balloons of pulling down the rubber sheet?

_____ [1]

- (iii) What does the process in (b)(ii) represent?

_____ [1]

- (c) Give **TWO** effects of smoking cigarettes on the lungs.

_____ [2]

TOTAL MARKS [10]

7. The steps below describe the processes of reproduction in a flowering plant. Identify the process occurring at each step.

(a) (i) The transfer of pollen grains from anther to stigma.

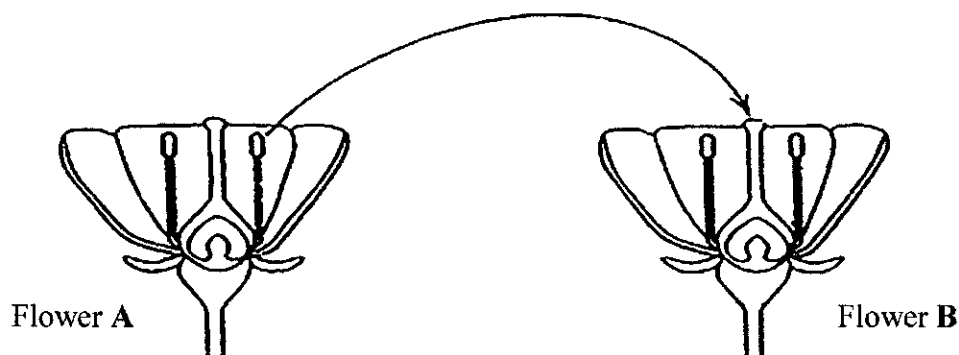
(ii) Male nucleus in pollen grain fusing with female nucleus in ovum.

(iii) Seeds being spread from parent plant in fruits.

(iv) Swelling of seed and growth of radicle.

[4]

(b) The diagram shows flowers from two different plants, A and B.



(i) Name the process occurring between flower A and flower B.

_____ [1]

(ii) Give **ONE** reason for your answer.

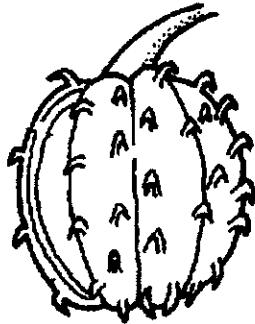
_____ [1]



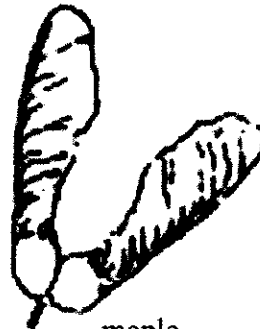
- (c) List **TWO** external conditions needed for seeds to start their initial growth.

_____ [2]

- (d) From the pictures shown below, identify the **TWO** methods for spreading seeds from a parent plant.



castor oil



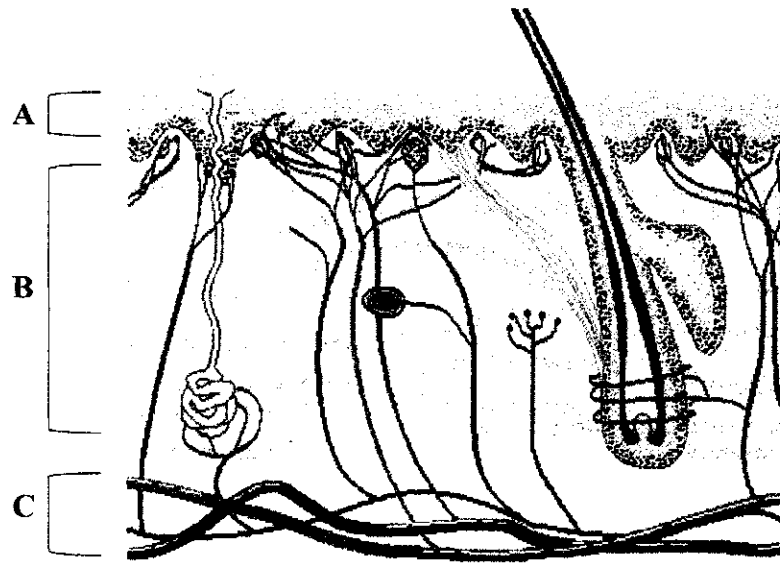
maple

castor oil _____

maple _____ [2]

TOTAL MARKS [10]

8. The diagram shows a section through the human skin.



- (a) Define the term homeostasis.

[2]

- (b) Name layer C and state its role in temperature regulation.

Layer C _____

Role _____

[2]

- (c) (i) On the diagram, draw a line to **TWO** structures, other than part **C**, that are involved in temperature regulation and label them **X** and **Y**. [2]

- (ii) Name structure **X** and structure **Y**.

Structure **X** _____

Structure **Y** _____ [2]

- (iii) Describe how structure **X** and structure **Y** are used to bring about a lowering of body temperature back to its normal value.

X _____

Y _____

_____ [2]

TOTAL MARKS [10]



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School Number	Candidate Number
Surname and Initials	

BIOLOGY

PAPER 3 3009/3

Wednesday **23 MAY 2018** 12:30 P.M.–2:00 P.M.

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.

Answer **TWO** out of **THREE** questions in **Section B** in the spaces in the question booklet. Candidates are advised to spend no more than 35 minutes on **Section A**.

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

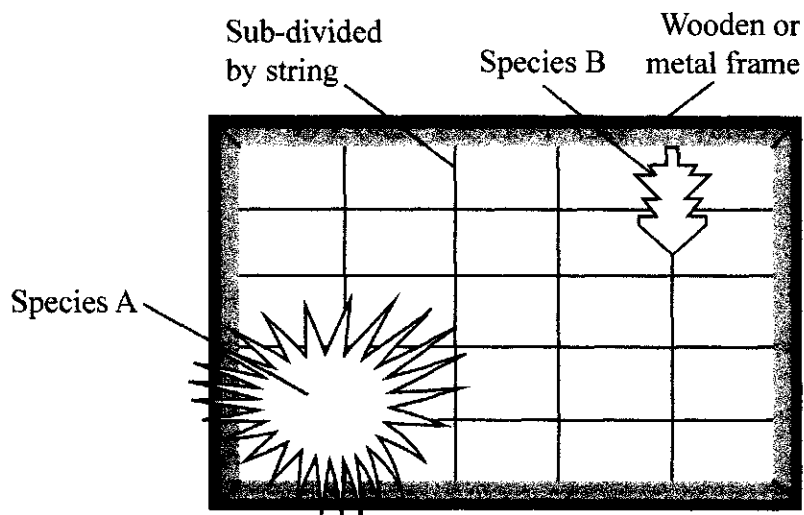
Calculators are permitted however, **NO** graphing calculators are allowed.

For Examiner's Use	
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TOTAL	

This question paper consists of 12 printed pages, 10 lined pages and 2 blank pages.

SECTION A

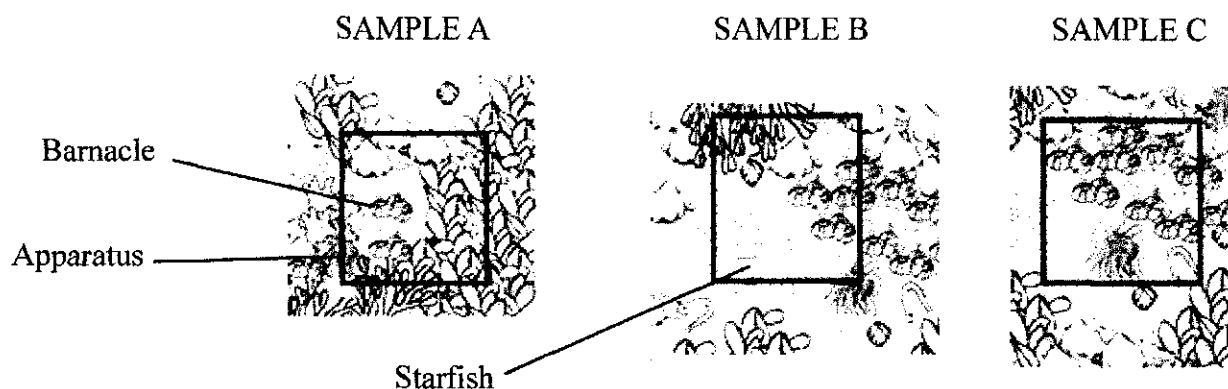
1. This question involves an investigation carried out by students on collecting data on an ecology fieldtrip to a rocky shore. The diagram shows the apparatus that they used.



- (a) (i) What is the name of this piece of apparatus? [1]
- _____
- (ii) What is this piece of apparatus used for? [1]
- _____
- _____
- (iii) Briefly describe how this piece of apparatus is used. [2]
- _____
- _____
- _____
- (iv) This apparatus works better with periwinkles rather than crabs. Explain why. [1]
- _____
- _____



- (b) The diagram below shows a survey which can be done to investigate organisms found living on a rocky shore ecosystem.



$$\text{Density} = \frac{\text{total number of individuals counted in samples A, B and C}}{\text{numbers of samples} \times \text{apparatus area}}$$

If the area of the apparatus is 0.25m^2 , use the formula above to calculate:-

- (i) Barnacle density

- (ii) Starfish density

_____ [2]

- (c) Comment on what your answer in part (b), tells you about these two organisms in this ecosystem.

_____ [1]

- (d) Name another sampling technique and state what it can be used to show.

Name of technique _____

What it is used to show _____

_____ [2]

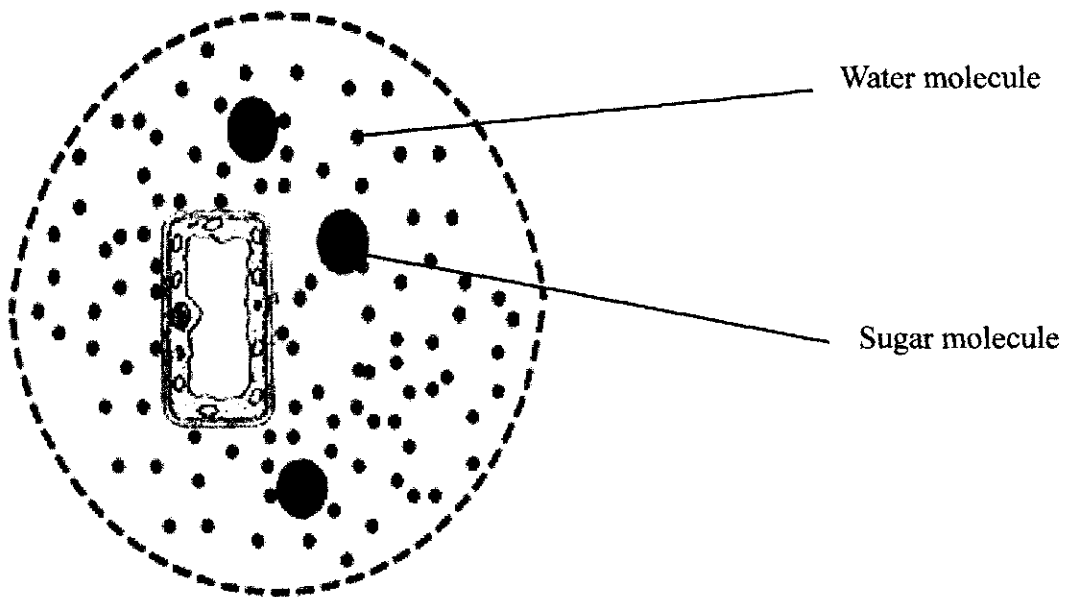
TOTAL MARKS [10]

2. This question refers to the process of osmosis in cell

(a) Define the term osmosis.

[2]

(b) The diagram shows a plant cell in its original appearance before it is placed in a solution of sugar and water. The cell sap vacuole has a higher solute/sugar concentration than the external solution. [Diagram not drawn to scale]



- (i) Draw an arrow on the diagram on page 4 to show the direction of water movement between the solution and the plant cell. [1]

- (ii) What term describes the condition of this cell after being in the solution for 24 hours?

_____ [1]

- (iii) The cell shown in the diagram in part (b)(i) was then placed in a very concentrated sugar solution (hypertonic).

Draw a diagram in the space below to show how it would look after 24 hours in this solution. [3]

- (c) The table below shows some results from an experiment involving measuring the length of potato strips.

potato strip	initial length of potato strip/cm	length of potato strip after 24 hours in solution/cm	% change in length of potato strip
A	4.0	4.4	
B	4.0	4.0	0

- (i) Calculate the percentage change in length for potato strip A. Write your answer in the table. [1]

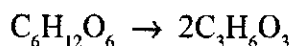
- (ii) Suggest what type of solution strip A and strip B were placed in.

Strip A _____

Strip B _____ [2]

TOTAL MARKS [10]

3. The equation shows a process that occurs in living tissue and results in the release of energy.



- (a) (i) Name the process shown in the equation.
_____ [1]
- (ii) Name the tissue in the human body in which this process most often occurs.
_____ [1]
- (iii) When is this process most likely to occur?
_____ [1]
- (iv) Describe how the toxic waste product from this process is removed from the blood.

_____ [2]
- (b) The process shown by the equation at the beginning of this question, and alcoholic fermentation in yeast, both result in the release of energy.

Write the balanced chemical equation for the process of alcoholic fermentation.
_____ [2]
- (c) Name the energy containing compound produced in both of these processes and state **TWO** ways in which it is used by organisms.

Compound name _____
Use 1 _____
Use 2 _____ [3]

TOTAL MARKS [10]



4. Species of all organisms show genetic variation amongst their individuals.

(a) List **THREE** possible causes of genetic variation within a species.

 [3]

(b) The data below was collected by a horticulturist investigating height variation in a species of sod grass.

category of height measurement/ mm	individual values for height/mm	total number of plants measured in each category
120–130	124, 125, 120, 128, 127, 128, 127, 121	8
131–140	132, 131	_____
141–150	150	_____
151–160	159, 160, 158, 158, 152	_____
161–170	167, 167, 163, 161, 167, 164, 162	_____

(i) Name the type of variation being studied in this investigation.

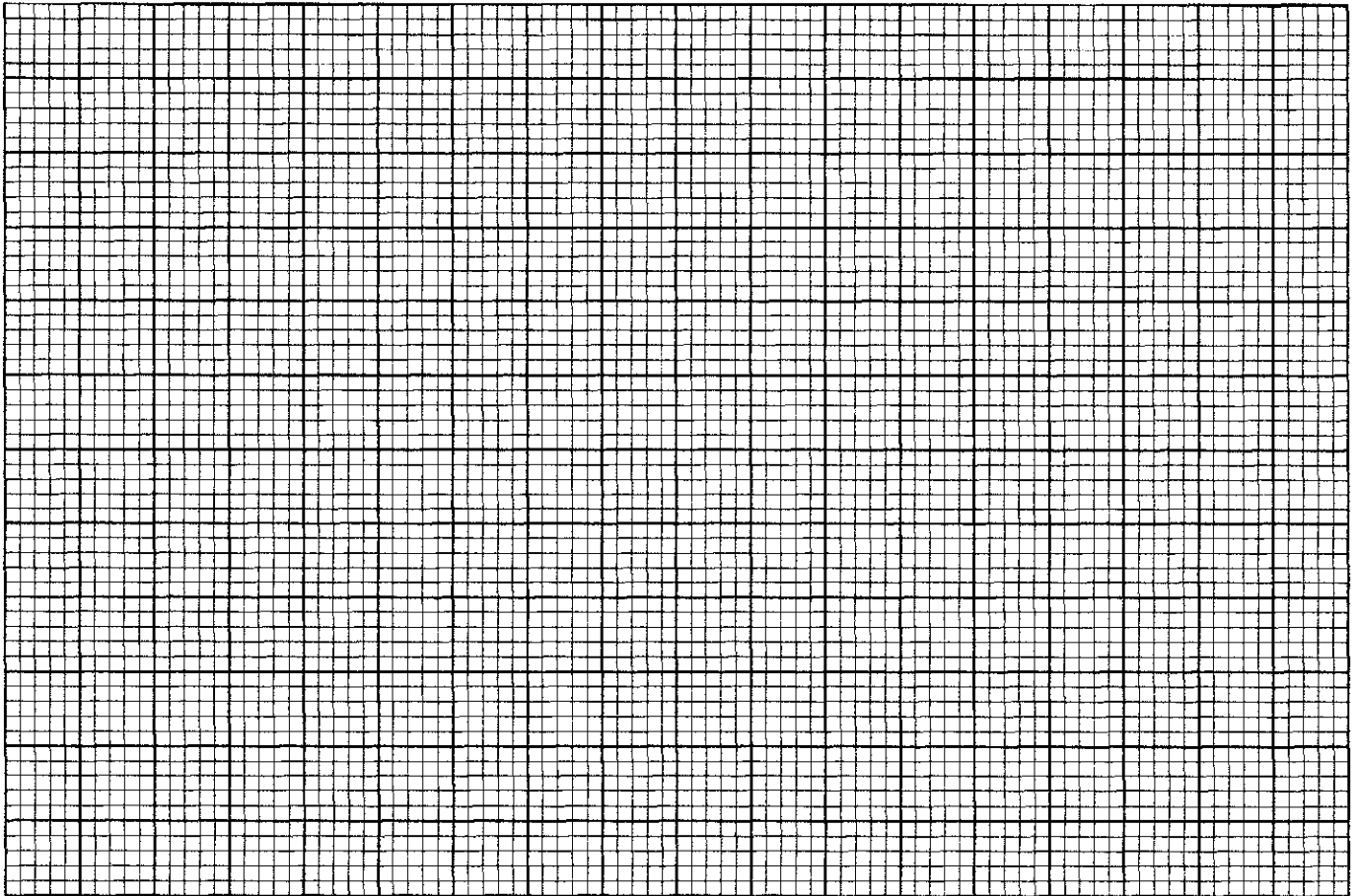
 [1]

(ii) Complete the table above filling in the missing values.

[1]



- (iii) Plot a graph of your totals for each category on the graph paper provided.



[4]

- (iv) How does this graph differ from the one normally expected for this type of variation?

[1]

TOTAL MARKS [10]



SECTION B

Answer any **TWO** questions

5. (a) (i) Corn (maize) is a staple crop grown in The Bahamas.
Explain what is meant by a staple crop. [1]
- (ii) State **TWO** food products made from corn. [2]
- (iii) Identify **TWO** methods of preservation and **TWO** methods of packaging being used to extend the shelf life of these products. [4]
- (b) Explain how farmers use chemicals to aid in the healthy growth and development of corn. [5]
- (c) Describe **THREE** other techniques of modern farming that have helped to increase corn production. [6]
- (d) Name **TWO** natural threats faced by Bahamian farmers. [2]

TOTAL MARKS [20]

6. This question refers to gas exchange in animals and plants.

- (a) Define the term gas exchange. [2]
- (b) List **FOUR** adaptations of a gas exchange surface in animals which make it efficient for this process. [4]
- (c) The **TWO** diagrams below show two different structures used for the process of gas exchange.

Diagram 1

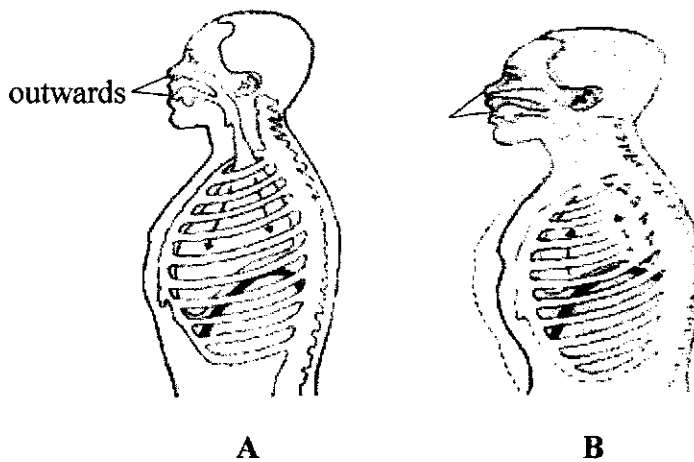
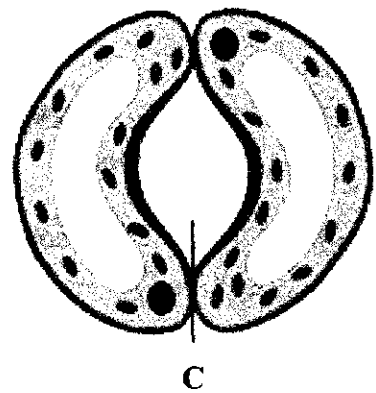


Diagram 2



- (i) Study **Diagram 1** and identify the process shown in picture A. [2]
State **TWO** reasons, visible in the **Diagram 1**, to support your answer. [3]
- (ii) How does the process identified in (c)(i) aid in the process of gas exchange? [2]
- (d) Using **Diagram 2 only**:
 - (i) Name part C. [1]
 - (ii) Explain fully how the size of structure C can be increased. [4]
 - (iii) Explain fully why carbon dioxide is more likely to enter through structure S during the day than at night. [4]

TOTAL MARKS [20]



7. Tropism and reflex actions are two ways of responding to a stimulus.

(a) Distinguish between the terms tropism and reflex action. [4]

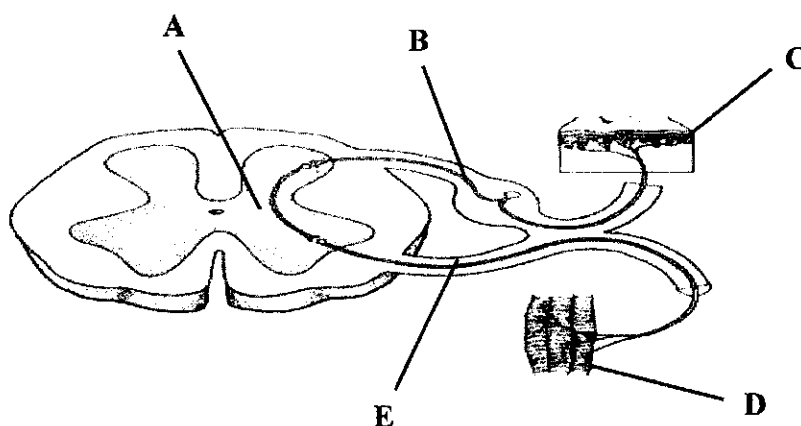
(b) The diagram below shows a plant responding to a light stimulus.



(i) State the name of the response shown by the shoot in the diagram. [1]

(ii) Name the hormone which causes this response and explain fully how this response is caused. [5]

(c) The diagram below shows a reflex arc.



(i) Name the structures labelled **B** and **E** and describe their functions in this response. [4]

(ii) Identify where a synapse may be found in this diagram and describe what happens there during this response. [4]

(d) State **TWO** ways in which a hormonal response is different to that of a nervous response in humans. [2]

TOTAL MARKS [20]

Question
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[illegible]

Question
Write on both sides of the paper

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Question
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Write on both sides of the paper

[illegible]

Question
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Question
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[illegible]

Question
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[illegible]

Question
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[illegible]

Question
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This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

Question
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[illegible]

Question
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School Number	Candidate Number
Surname and Initials	

BIOLOGY

ALTERNATIVE TO PRACTICAL

PAPER 5 3009/5

Wednesday **23 MAY 2018** 2:15 P.M.–3:15 P.M.

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 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 [].

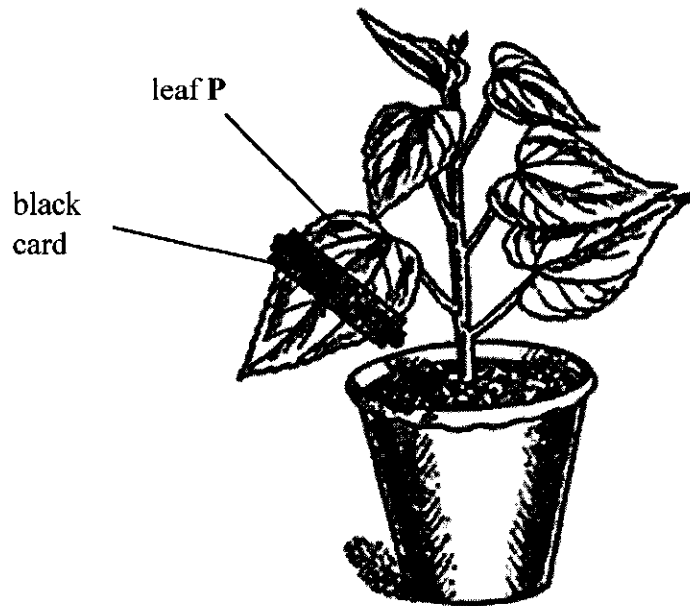
No additional sheets of paper should be placed in this book.

For Examiner's Use	
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This question paper consists of 9 printed pages and 3 blank pages.

1. A student set up an experiment to investigate the effect of one variable on photosynthesis. The diagram shows the apparatus that they used.



- (a) What variable is being studied in this investigation?

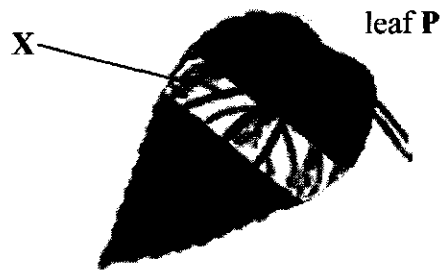
[1]

- (b) After 24 hours leaf P was tested for starch.
Name the test reagent used and describe the method used to carry out this test.

[5]



- (c) Leaf **P** was removed from the plant. The diagram shows the leaf after testing for starch. Label **X** shows the area that was covered by black card.



- (i) Explain why area **X** did not turn blue-black.

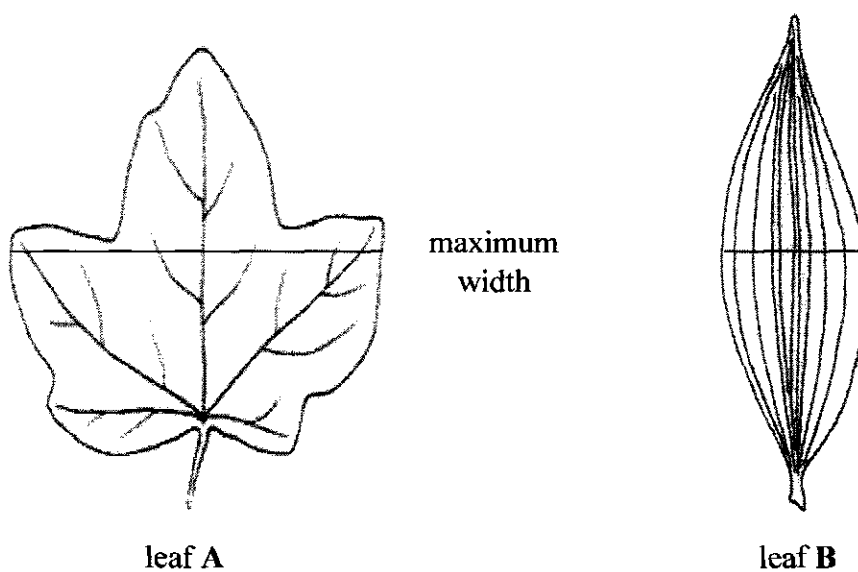
[2]

- (ii) List **TWO** other factors that may affect the rate of photosynthesis.

[2]

TOTAL MARKS [10]

2. The diagram shows two different types of leaves.



- (a) Measure the length of leaf A and B and the width of each leaf at its widest point. Record the results in the table.

leaf	length/cm	width/cm
A		
B		

[2]

- (b) In the space below draw leaf B, twice the size shown in the diagram.

[2]

- (c) List **TWO** ways, observable in the diagrams, in which leaf **A** differs from leaf **B**.

Difference 1 _____

Difference 2 _____

_____ [2]

- (d) (i) Both monocots and dicots are angiosperms. State **ONE** reason why.

_____ [1]

- (ii) State **TWO** characteristics of monocotyledonous plants.

_____ [2]

- (iii) Named **ONE** economically important monocotyledonous plant found in The Bahamas.

_____ [1]

TOTAL MARKS [10]

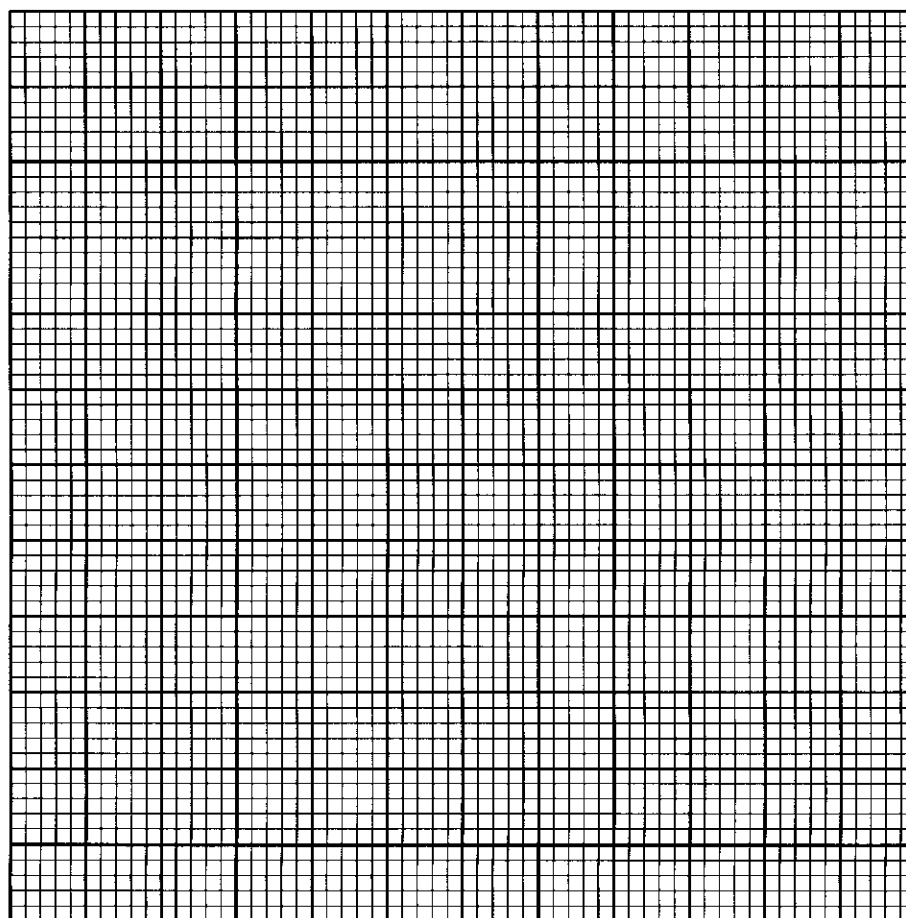


3. A student investigated the effect of exercise on her heart rate.
The table shows her results.

time/minutes	heart rate/beats per minute
0	60
10	60
20	140
30	140
40	80
50	60

- (a) Plot a line graph using the data in the table above.

[4]



- (b) (i) Calculate the increase in heart rate between 10 minutes and 20 minutes.

_____ [1]



- (ii) Explain why this change was seen in the heart rate during exercise.

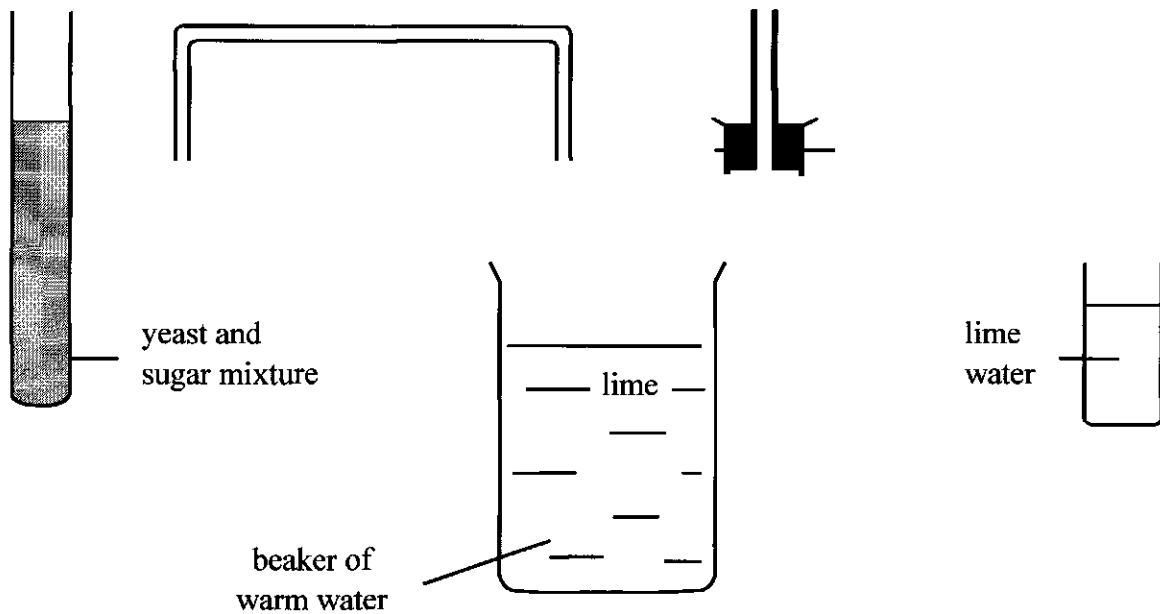
 [2]

- (c) Use the results table, or your graph, to calculate the length of time for which the exercise lasted. Explain your answer.

 [3]

TOTAL MARKS [10]

4. Yeast are fungi that ferment carbohydrates, producing a gas in the process. Below are the materials that may be used to investigate the production of this gas.



- (a) Draw a diagram to show how the apparatus and materials would be set up during the investigation.

[4]

- (b) State how the rate of production of gas can be measured in this investigation.

[2]



- (c) (i) Suggest a suitable temperature for the warm water in this investigation.

_____ [1]

- (ii) Explain your suggestion.

_____ [1]

- (d) Describe and explain what would happen if this experiment was carried out at 60°C

_____ [2]

TOTAL MARKS [10]

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