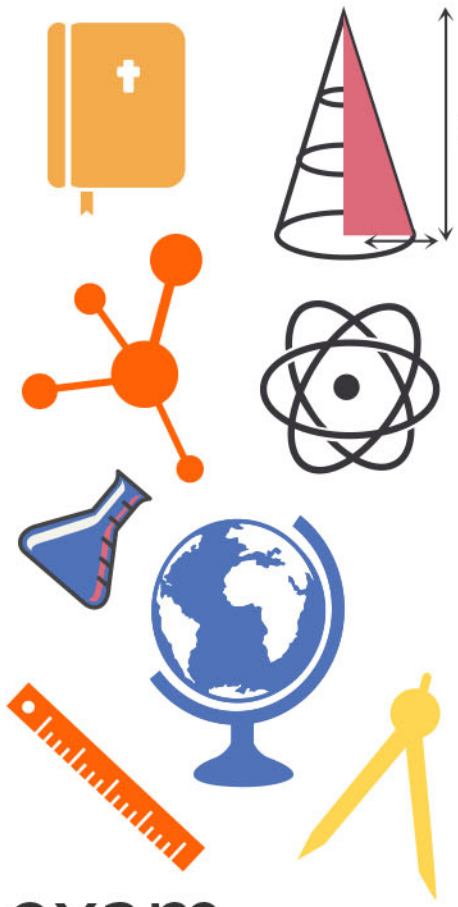

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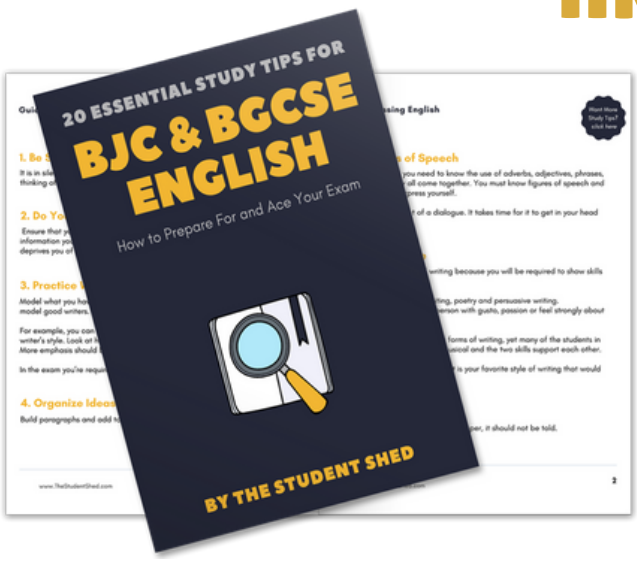

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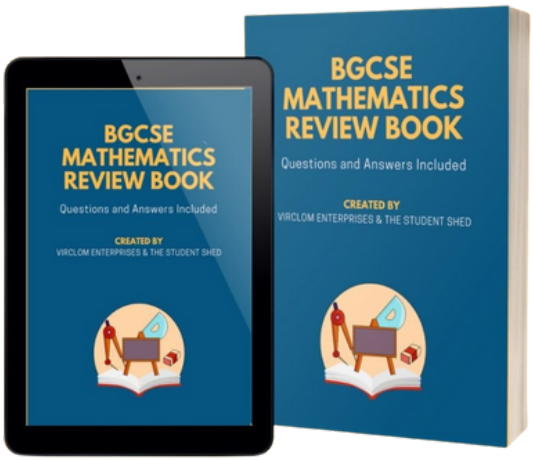

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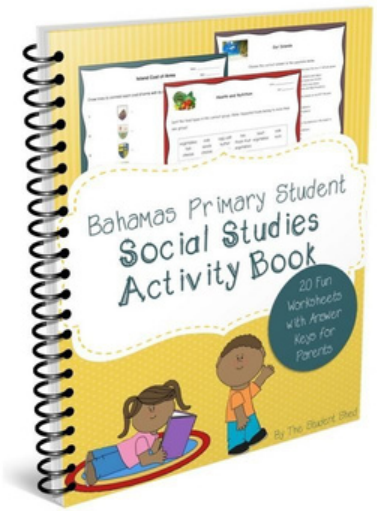

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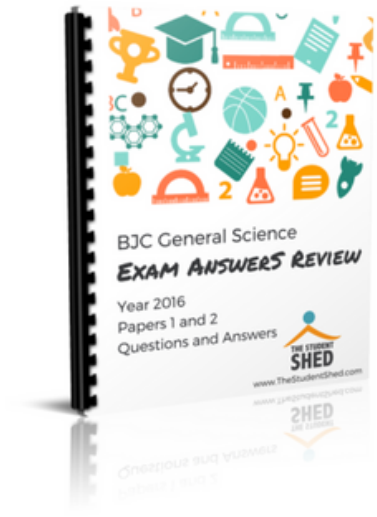

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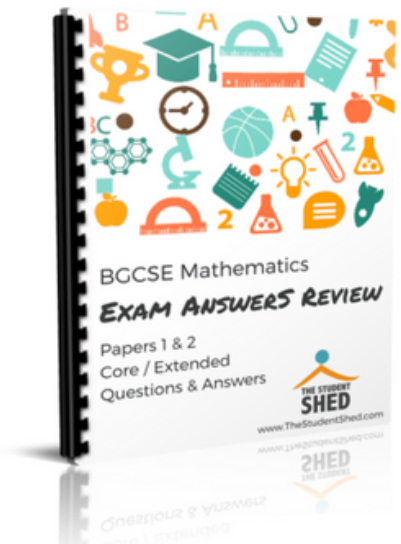

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BIOLOGY

PAPER 1

Monday **18 MAY 2009** 12.00 – 1.15 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.

There are fifty questions on this paper.

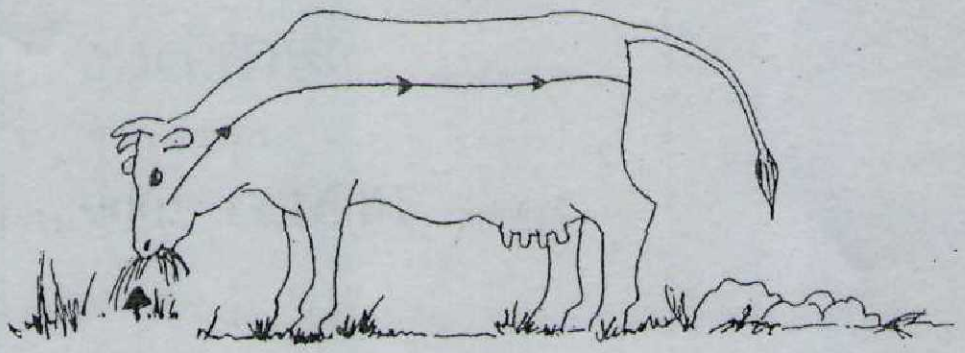
Attempt **ALL** *questions.*

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

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

This question paper consists of 25 printed pages and 3 blank pages.

1. The diagram shows a mammal.



Which characteristic of living things is represented by the arrows?

(A) excretion

B growth

C nutrition

D respiration

2. Which of the following animal pairs are most closely related to each other?

A bony fish and crawfish

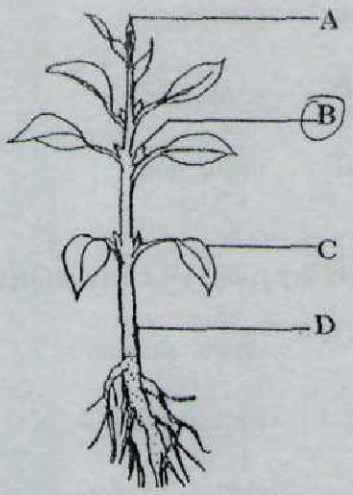
B frog and lizard

(C) grouper and shark

D lion and seahorse

3. The diagram shows a typical flowering plant.

Which letter labels the structure from which the branches or aerial roots grow?



4. Which consumer obtains its energy from producers only?

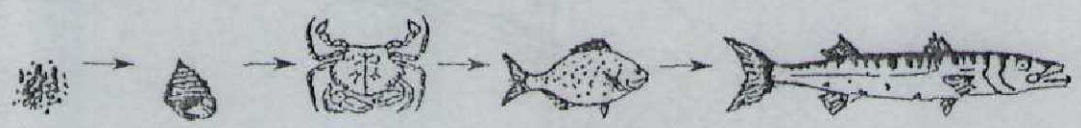
A carnivore

B decomposer

C herbivore

D omnivore

5. The diagram shows a food chain.



Over-fishing the barracuda may result in the

A decrease in the number of shads.

B decrease in the number of prickly winkles.

C increase in the number of the crabs.

D increase in the number of the prickly winkles.

6. Which process removes carbon dioxide out of the atmosphere?

A combustion

B decomposition

C photosynthesis

D respiration

7. During which process are nitrates broken down to release nitrogen gas?

A ammonification

B denitrification

C nitrogen fixation

D respiration

8. The diagram shows a part of the inflorescence of a maize plant (*Zea mays*). Which statement about this part of the inflorescence is correct?

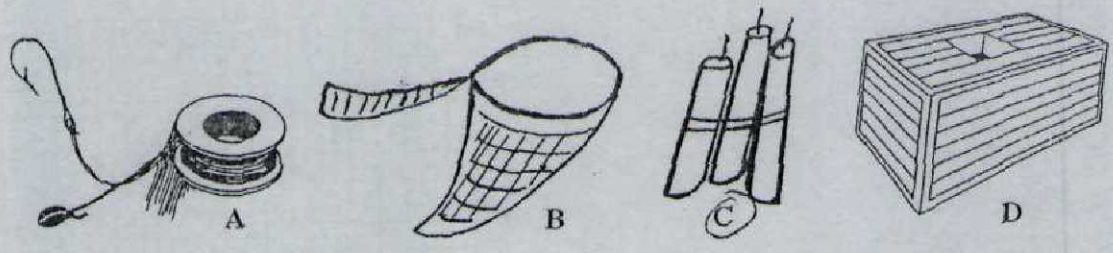
A It develops from an axillary bud.

B It is called the "cob" or "ear."

C It contains the female flowers.

D It contains the male flowers.

9. The diagrams show four types of instruments used to capture marine species. Which method is illegal in The Bahamas?



10. Which is the most important method used today to protect the mangrove ecosystem?

A Limit collection of firewood.

B Moving the animals to a zoo.

C Pass laws to preserve the ecosystem.

D Put dams around the ecosystem.

11. Which of the following is an example of osmosis?

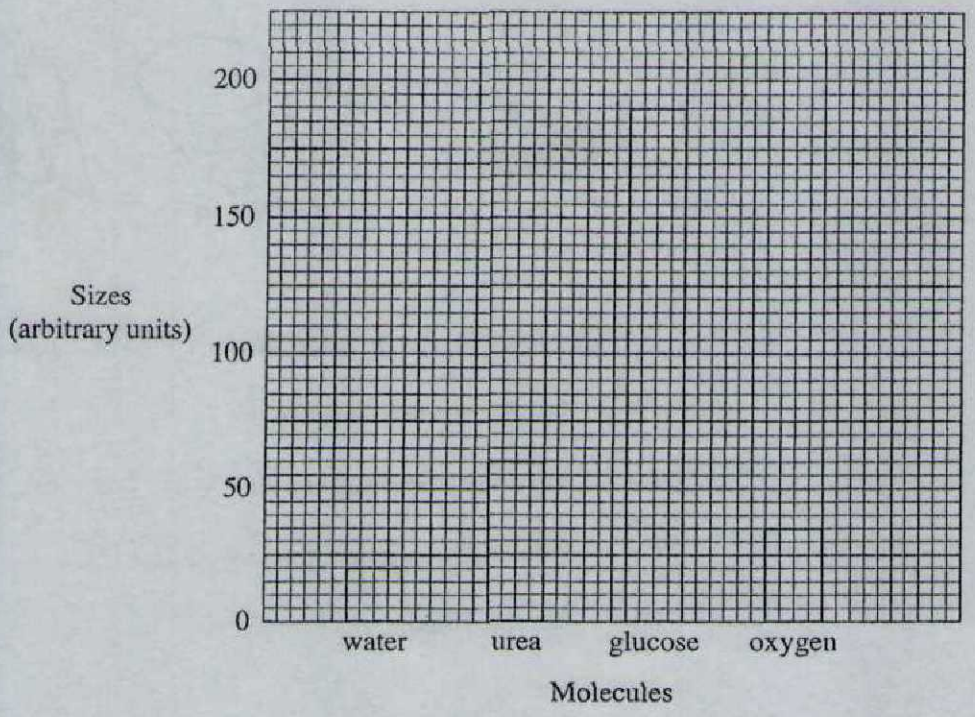
A mineral salts passing into root hairs

B oxygen passing into the blood

C sunlight entering leaf cells

D water moving into root hairs

12. The graph shows the sizes of several molecules that can diffuse across a partially permeable membrane.



Which substance will diffuse across the partially permeable membranes the fastest?

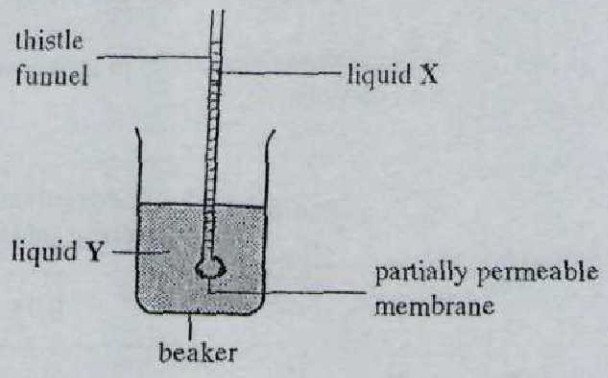
(A) glucose

B oxygen

C urea

D water

13. An experiment was set up to demonstrate a process which occurs in living organisms.



After 30 minutes the level in the thistle funnel rose. What does this show?

A Liquid **X** is a concentrated solution and **Y** is a dilute solution.

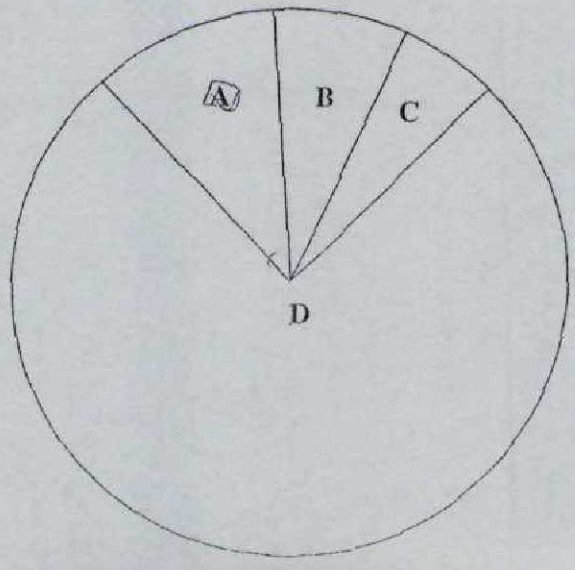
B Liquid **X** and liquid **Y** are dilute solutions.

C Liquid **X** is a dilute solution and liquid **Y** is a concentrated solution.

D Liquid **X** and liquid **Y** are concentrated solutions.

14. The pie chart shows the relative amounts of carbohydrate, fat, protein and water which make up the human body.

Which letter identifies the amount of protein in the body?



15. An experiment was set up to find the effect of different concentrations of sucrose solutions on potato strips. The changes in the weight of the strips are shown below.

Which sample was placed in the solution with a concentration almost equal to that of the potato cells?

Sample	Concentration of sucrose solution (m)	Chance in weight (%)
A	0.05	+10
B	0.1	+8
C	0.3	–1
D	0.7	–13

16. Which of 30 g of the food samples listed will give the most energy when digested and absorbed?

A boiled cabbage

B bread

C butter

D lean meat

17. The table shows the amount per serving of nutrients listed on a box of cereal.

Nutrient	Amount per serving (serving size 1 cup/g)
Total fat	2
Sodium	280
Total carbohydrate	22
Protein	3

How many grams of nutrients containing carbon, hydrogen and oxygen **only**, will be eaten if a person ate **two** cups of this product?

A 54

B 48

C 27

D 24

18. Which enzyme breaks down fat?

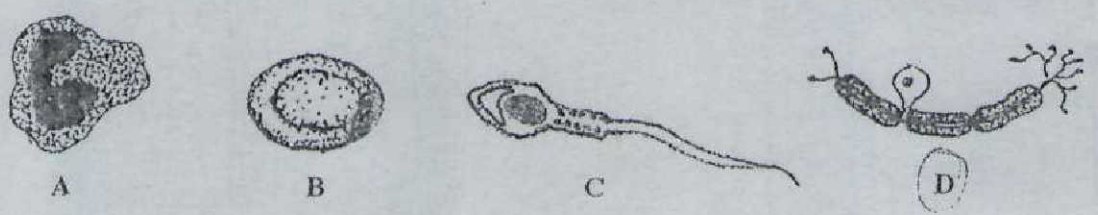
A amylase

B carbohydrase

C lipase

D protease

19. Which cell is best suited to transmit impulses?



A B C D

20. What is the role of roughage in the diet?

A for growth and repair

B to help food move through the gut

C to help form healthy bones and teeth

D to provide energy

21. Which factor below is **NOT** necessary for photosynthesis to occur?

A carbon dioxide

B chlorophyll

C oxygen

D water

22. Which organelle in plant cells contains the pigment that makes leaves green?

A cell wall

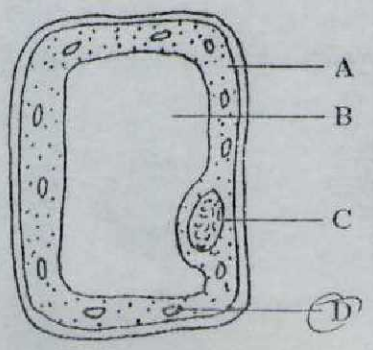
B chloroplast

C mitochondria

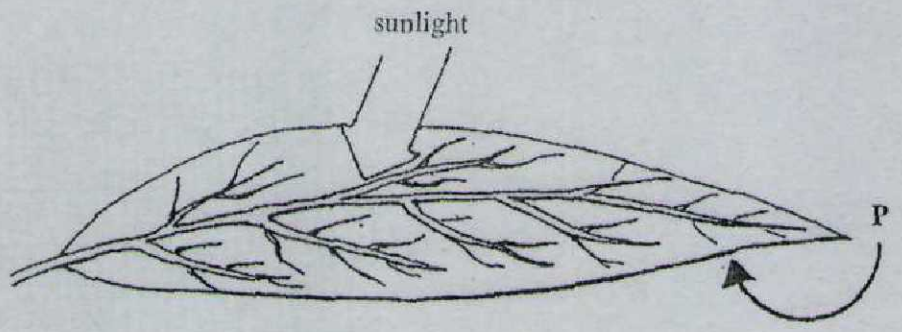
D vacuoles

23. The diagram shows a typical plant cell.

Which part of the cell is the place where photosynthesis occurs?



24. The diagram shows a leaf in sunlight.



What gas is represented by arrow **P**?

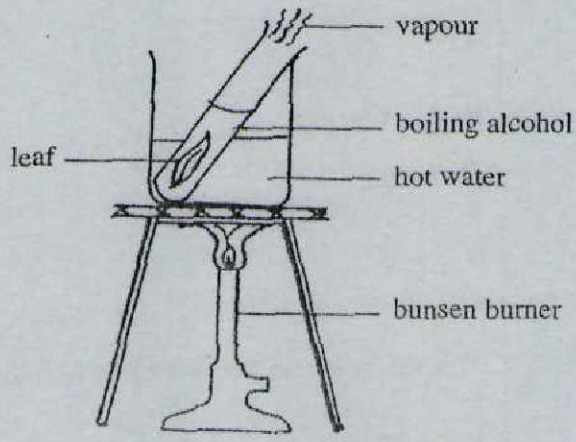
(A) carbon dioxide

B nitrogen

C oxygen

D water vapour

25. The diagram shows an experiment used to prove the presence of a certain substance in a leaf.



Which substance is being tested for?

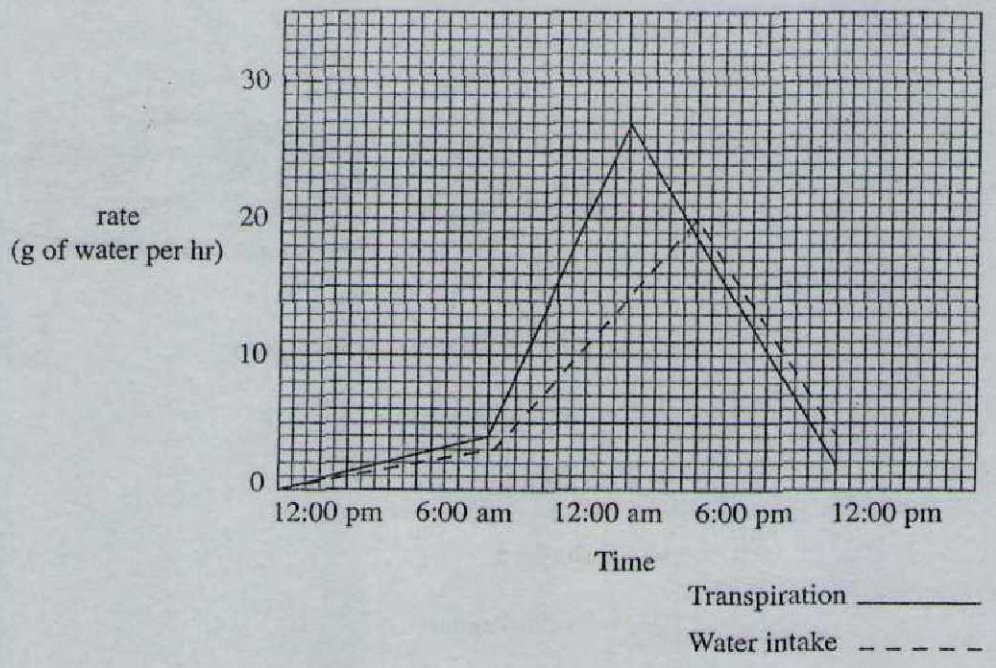
A carbohydrate

(B) chlorophyll

C nitrogen

D protein

26. The diagram shows the rates of transpiration and water intake of a plant over a 24 hour period.



How many grams of water are lost from the plant every hour when the transpiration rate is at the maximum?

A 6

B 17

C 20

D 27

27. Which substance is transported by haemoglobin?

A amino acids

B glucose

C glycogen

D oxygen

28. When a ring of bark is removed from a tree trunk a bulge appears above the ring after a while.

What valid conclusion can be drawn from this information?

A Sugars are transported in the phloem.

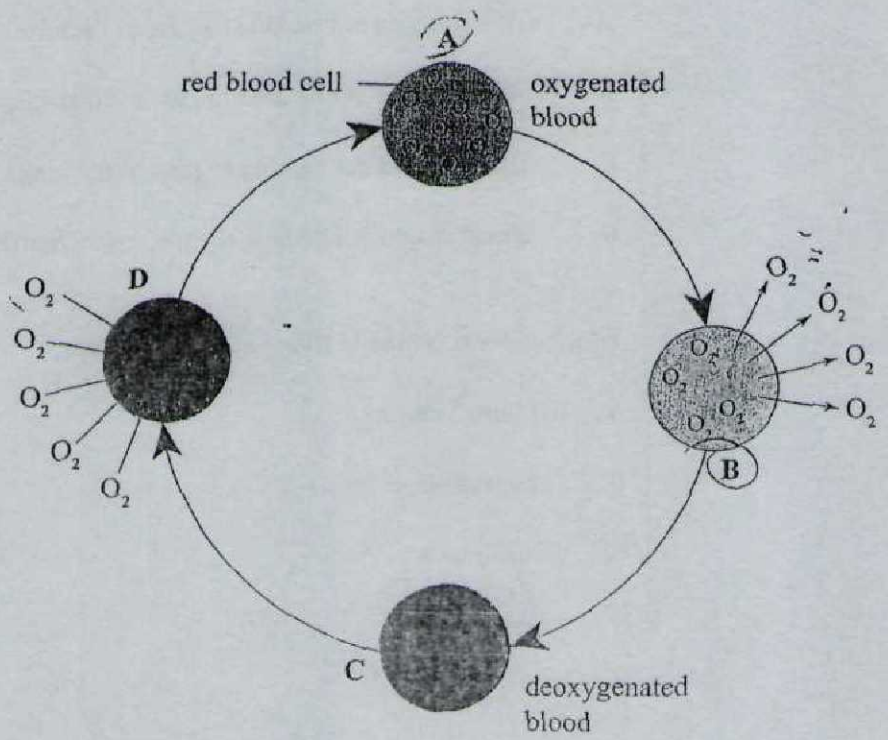
B The contents of the phloem are transported downwards.

C The contents of xylem are transported upwards.

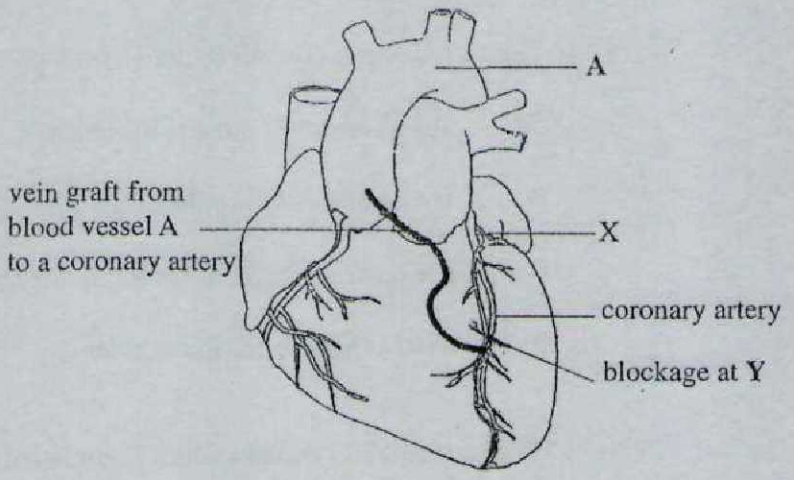
D Water is transported in the xylem.

29. The diagram shows changes which occur in red blood cells as they move through parts of the body.

Which stage in the diagram identifies what happens in all body tissue?



30. The diagram shows a heart which has undergone by pass surgery.



How would the blockage at **Y** affect blood circulation if the surgery was not done?

A Blood would not be able to pass to the atria.

B Blood would not be able to pass to the heart muscles.

C Blood would not be able to pass to the lungs.

D Blood would not be able to pass to the ventricles.

31. Which process occurs in living cells at all times?

A photosynthesis

B reproduction

C respiration

D translocation

32. A scientist was growing yeast cells in a nutrient solution. What is the likely source of carbohydrate for the yeast cells?

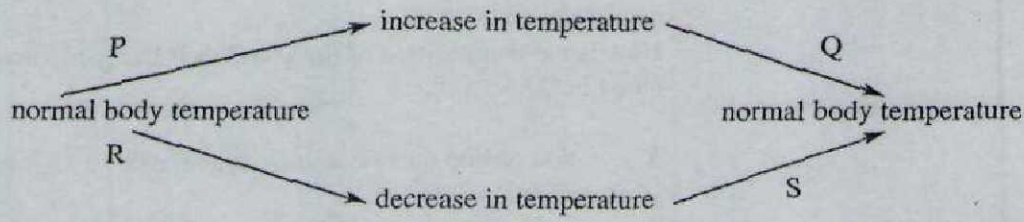
A alcohol

B cellulose

C fibre

D sucrose

33. The diagram illustrates the process of temperature regulation in a mammal.



Which process is occurring at S?

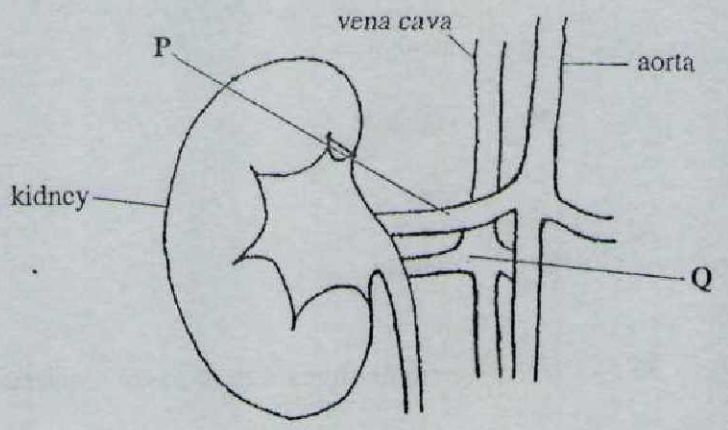
A sweating

B urinating

C vasoconstriction

D vasodilation

34. The diagram shows a section through a kidney and the related blood vessels.



How is the composition of the blood in **P** likely to vary from the composition of the *blood in* **Q**?

A less carbon dioxide, more oxygen, more urea, more water

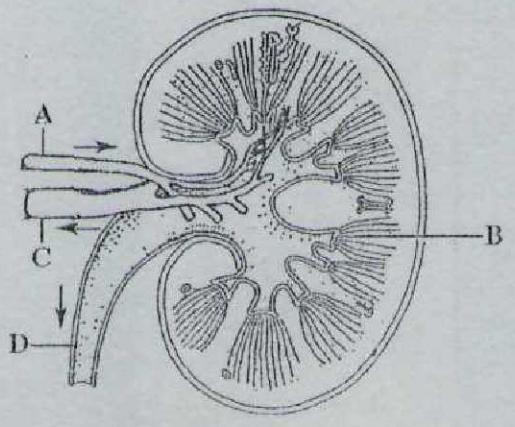
B less carbon dioxide, more oxygen, less urea, more water

C more carbon dioxide, less oxygen, less urea, less water

D more carbon dioxide, less oxygen, more urea, more water

35. The diagram shows a human kidney.

Which structure contains the lowest concentration of urea?



36. Which of the following activities in a mammal is **not** controlled by hormones?

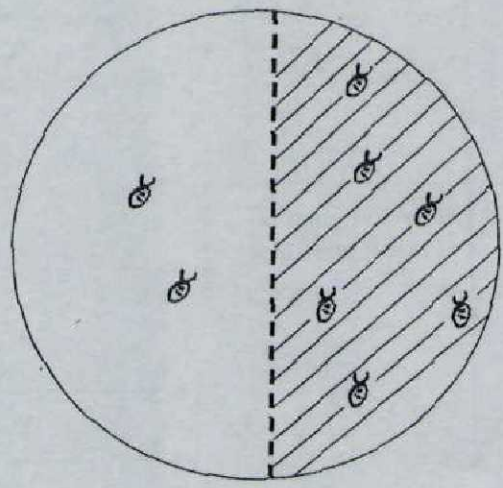
A change of glycogen to glucose

B contraction of leg muscles

C control of growth rate

D production of eggs

37. The diagram shows the results of an experiment using woodlice.



The majority of the woodlice collect on the dark side. What other stimulus cause the same behaviour?

A friction

B gravity

C high humidity

D high temperature

38. Which term best describes the movement of woodlice away from the light?

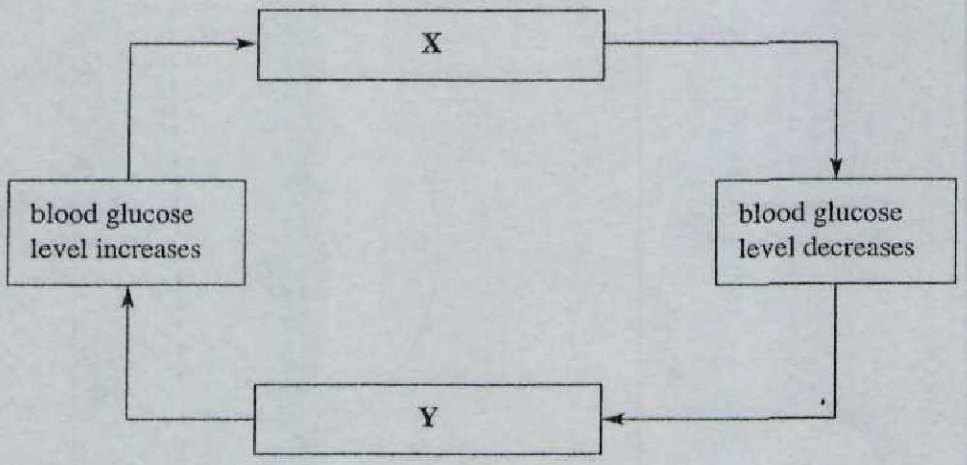
A taxis

B thrombosis

C tropism

D trypsin

39. The diagram represents glucose metabolism in the body.



What is hormone **X**?

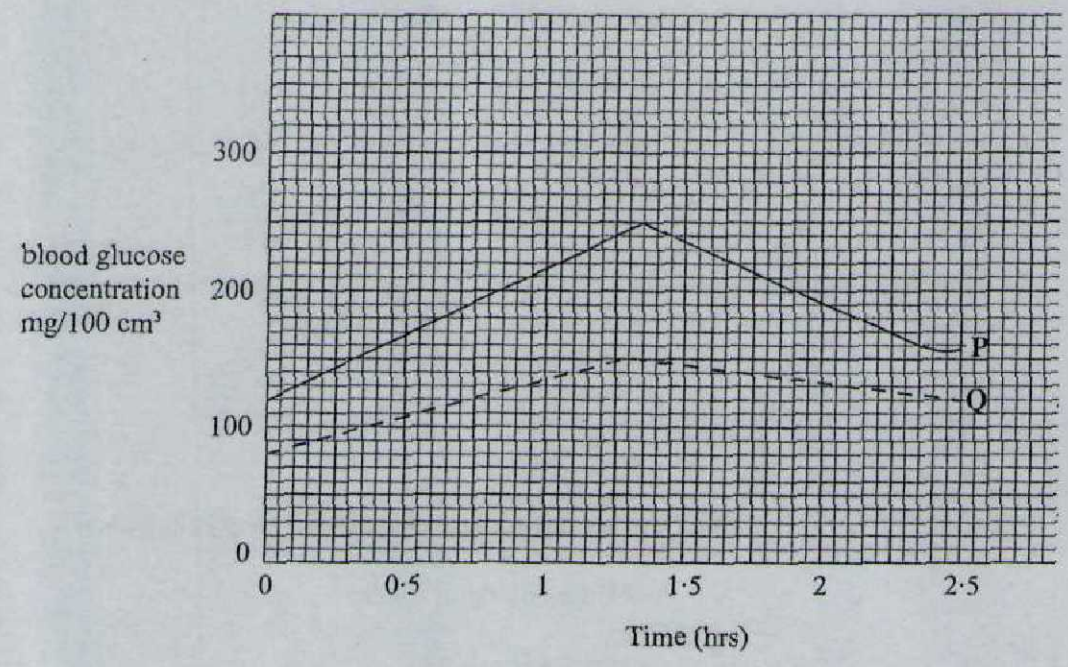
A adrenaline

B insulin

C oestrogen

D testosterone

40. The graph shows the result of a blood test for glucose of two persons, **P** and **Q**.



What is the difference between the maximum blood glucose concentration of **P** and **Q**?

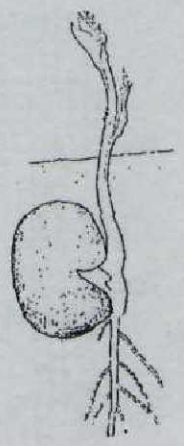
A 25 mg/100 cm^3

B 75 mg/100 cm^3

C 100 mg/100 cm^3

D 125 mg/100 cm^3

41. The diagram shows a germinating seed.



Which of the following are all needed for germination?

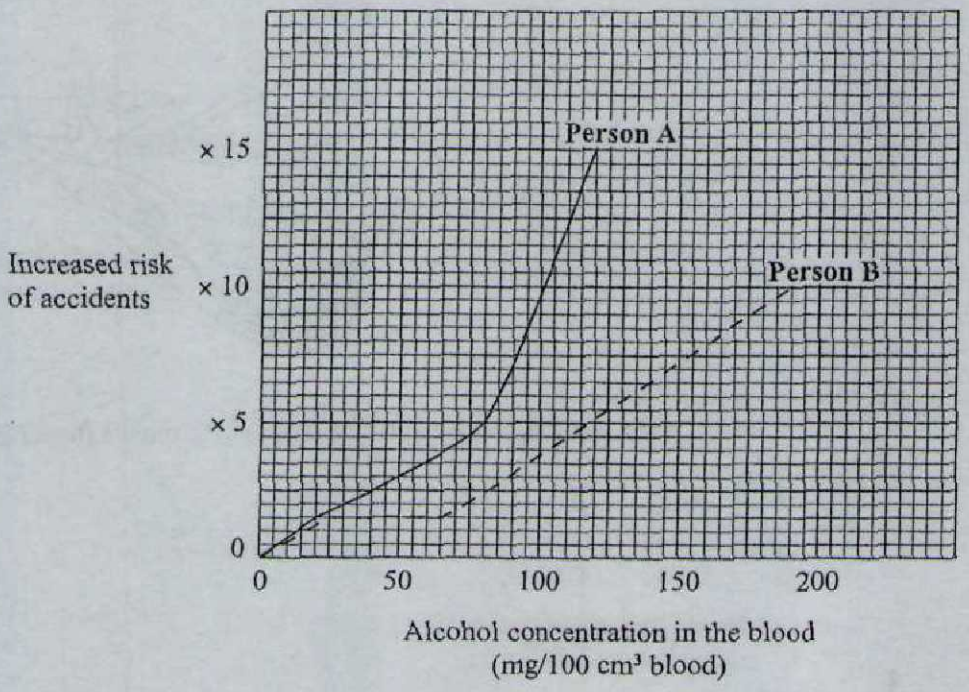
A chlorophyll, light, water

B light, oxygen, water

C oxygen, water, enzymes

D water, soil, enzymes

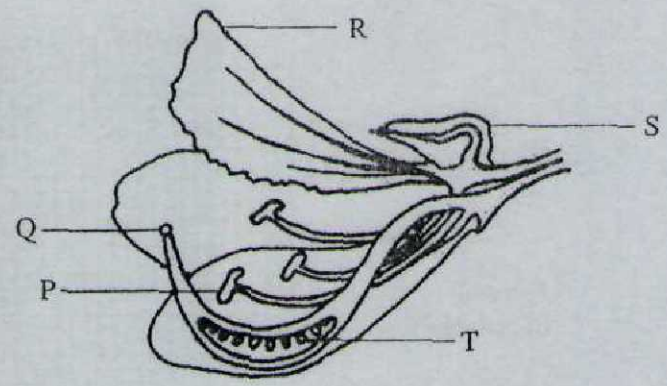
42. The graph shows the increased risk of accident associated with drinking alcohol in two different persons.



Approximately what concentration of blood alcohol level is needed in **Person A** and **Person B** for the accident risk to increase ten times?

	Person A	**Person B**
A	60	100
B	30	80
C	90	160
D	100	180

43. The diagram shows a flower.



Which structure(s) could not be removed from the flower if self-pollination is to occur?

A P

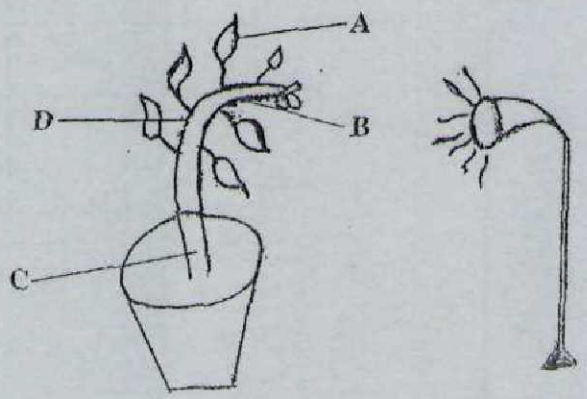
B P and Q

C P and S

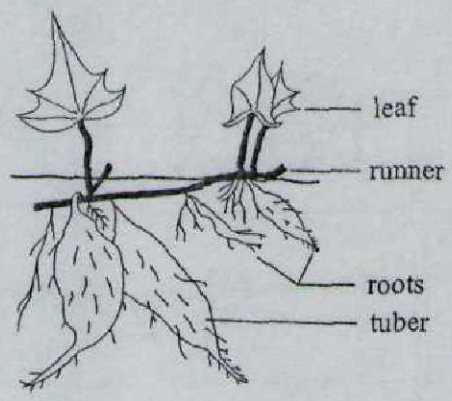
D S

44. The diagram shows phototropism in a potted plant.

Which letter indicates the area where the concentration of auxin is greatest?



45. The diagram shows a sweet potato plant.



If the plant has adequate water, what other factor will have a positive effect on the growth of the potato tuber?

A deeper soils

B increased leaf area

C longer roots

D shorter roots

46. Which of the following structures produces spermatozoa?

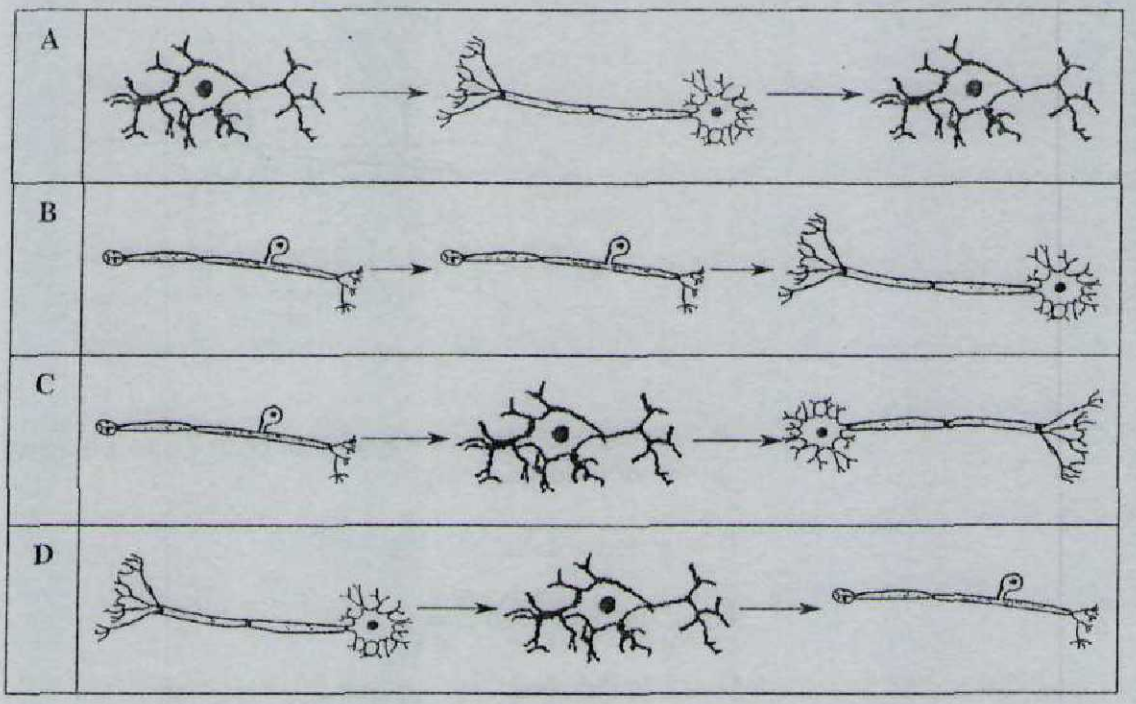
A epididymis

B prostate gland

C sperm duct

D testes

47. A person is startled by a dog and starts to run. What would be the correct sequence of neurones involved in the reflex action?



48. Which of the following can be detected by chemical receptors?

A gravity

B pressure

C stretching

D taste

49. Which is the correct sequence of structures through which light passes in the human eye before the impulse reaches the brain?

1 aqueous humor
2 cornea
3 lens
4 optic nerve
5 rods and/or cones
6 vitreous humor

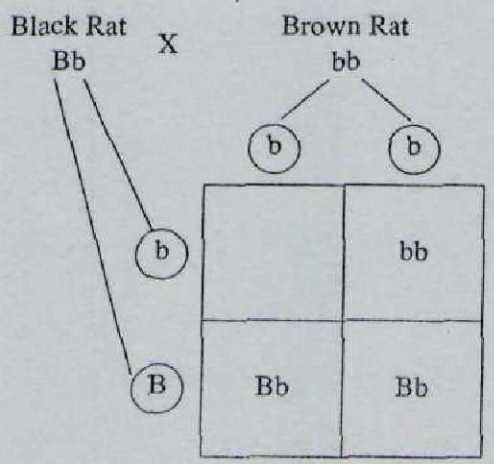
A 1, 3, 2, 6, 4, 5

B 2, 1, 3, 6, 5, 4

C 2, 6, 3, 1, 4, 5,

D 3, 6, 2, 1, 5, 4,

50. The diagram shows the possible genotypes of the offspring in a litter of rats.



Key B = allele for black fur
b = allele for brown fur

Which genotype should be placed in the empty box?

A BB

B Bb

C bB

D bb

End]

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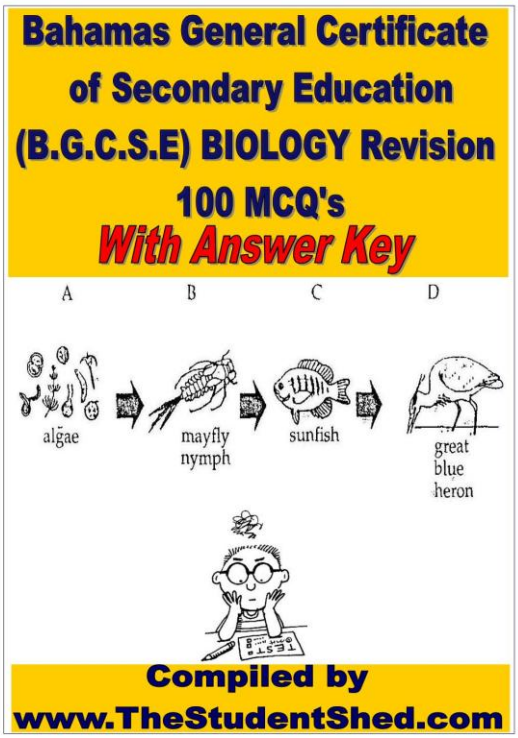

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BIOLOGY

PAPER 2 3009/2

Monday **18 MAY 2009** *1.20 P.M. – 2.50 P.M.*

MINISTRY OF EDUCATION
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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 [ ].

For Examiner's Use	
1	
2	
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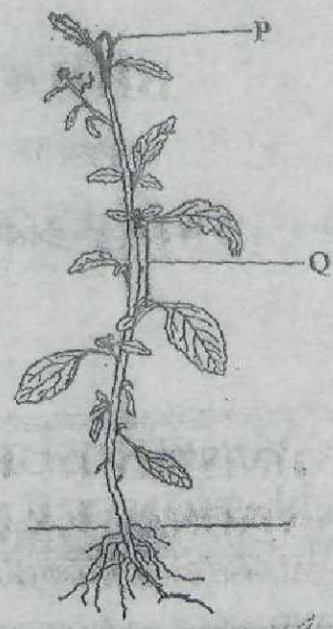
TOTAL	

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

1. The diagram below shows a flowering plant.



(a) Name the parts on the diagram labelled **P** and **Q**.

P _____

Q _____ [2]

(b) State the function of the part labelled **P**.

_____ [1]

(c) (i) Which group of flowering plants does the plant in the diagram belong to?

_____

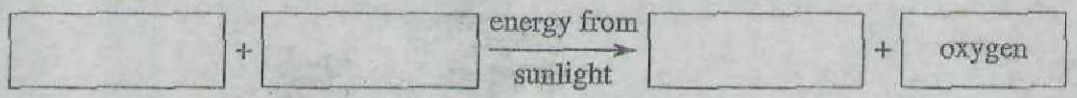
(ii) List **TWO** observable features of the plant shown that are characteristics of this group.

_____

_____ [3]

(d) Green plants make their own food.

(i) Complete a word equation by filling in the boxes below.



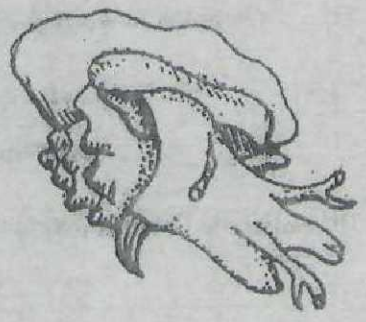
[3]

(ii) Name the process represented by the word equation.

_____ [1]

Total marks [10]

2. The diagram shows an adult Queen conch.



(a) Write the scientific name for the Queen conch.

_____ [1]

(b) Name the structure that is responsible for making the conch's shell.

_____ [1]

(c) Use the letter **X** to label the structure on the diagram that identifies the gender of the conch. [1]

(d) Describe the structure, visible on the diagram, that shows that this conch is sexually mature.

_____ [1]

(e) According to the Department of Fisheries in The Bahamas, the Queen conch is listed as a "threatened species".

Explain the term "threatened".

_____

_____ [2]

(f) Identify **ONE** factor that may cause a drop in the numbers of Queen conchs in The Bahamas and state how this factor causes a problem in the fishing industry.

_____

_____ [2]

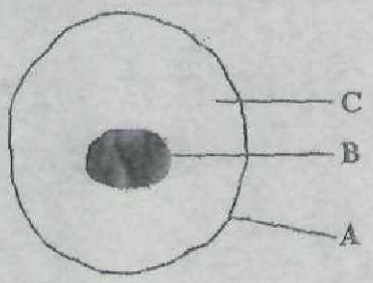
(g) State **TWO** methods of conservation of the conch practised in The Bahamas.

_____

_____ [2]

Total marks [10]

3. The diagram shows an epithelial cell from the lining of the human mouth as seen under a light microscope.



(a) Name the parts marked **A**, **B** and **C**.

A _____

B _____

C _____ [3]

(b) (i) Name the thread-like structures that are present in part **B**.

_____

(ii) State how many of these structures would be found in the cell shown in the diagram.

_____ [2]

(c) If the cell is placed in pure water it will swell and burst.

(i) Name the process responsible for these changes.

_____

(ii) Explain why these changes occur.

_____

_____ [3]

(d) Describe the effect on a plant cell of placing it in water. Explain the difference between this effect and that of the epithelial cell.

Effect: _____

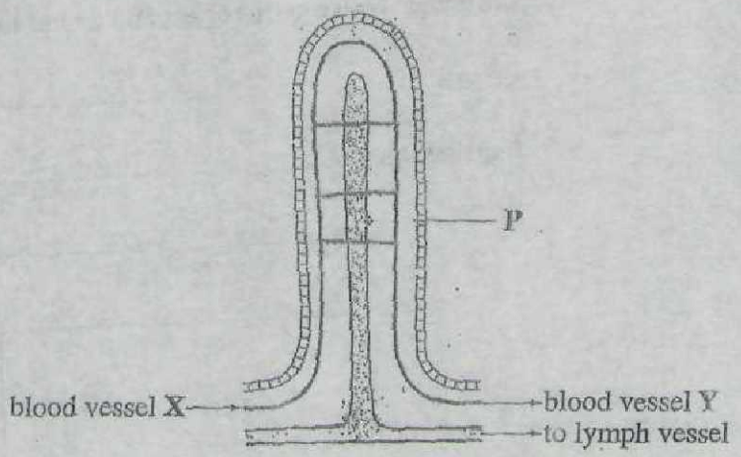
Explanation: _____

_____

_____ [2]

Total marks [10]

4. The diagram shows the structure of a villus.



(a) (i) In which part of the digestive system is this structure found?

_____

(ii) What function of the digestive system is carried out here?

_____

(iii) Name the structures found on part **P** that help to increase the surface area for this function to occur.

_____ [3]

(b) State **TWO** differences in the content of the blood in vessels **X** and **Y**.

_____

_____

_____ [2]

(c) Name the first organ to receive the blood from vessel **Y**.

_____ [1]

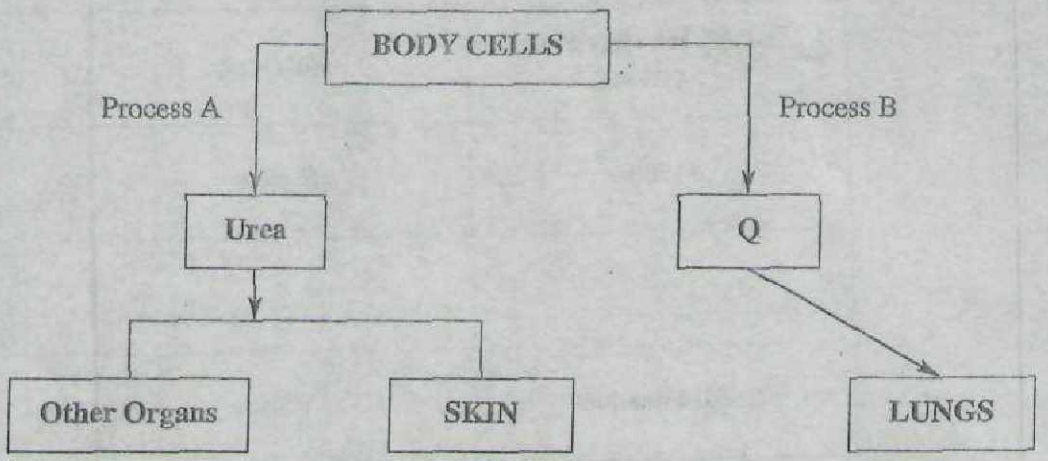
(d) Food is digested as it passes through parts of the digestive system. Complete the table which summarizes some parts of this process.

Part of the Digestive System	Nutrient	End Product
Mouth	Starch	(i) _____
(ii) _____	(iii) _____	Peptides
Small Intestines	Fats	(iv) _____

[4]

Total marks [10]

5. The diagram shows the formation and excretion of metabolic wastes of human body cells.



(a) Explain the meaning of excretion.

_____ [2]

(b) Identify the process **B** that occurs in all cells.

_____ [1]

(c) Identify the waste product **Q**.

_____ [1]

(d) (i) Name the organ that removes urea from the blood.

_____ [1]

(ii) Name **TWO** other organs through which urea passes on its way out of the body.

_____

_____ [2]

(e) In diabetes mellitus, glucose is excreted as a waste product. Explain how glucose becomes a waste product.

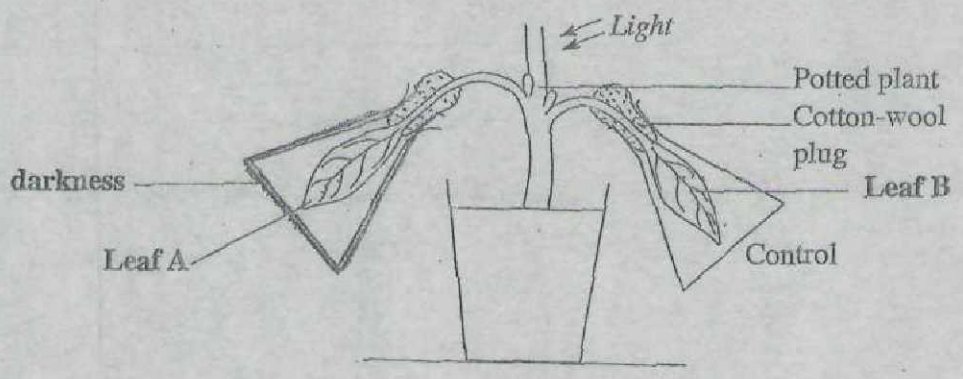
_____

_____

_____ [2]

Total marks [9]

6. The investigation below is used to show that light is needed in photosynthesis.



(a) List **TWO** effects the dark paper would have on **leaf A** after a few days.

_____

_____ [2]

(b) After 72 hours both leaves are tested for the presence of starch.

(i) Which reagent would be used to test the leaves for starch?

_____ [1]

(ii) State the colour change you would expect in:

Leaf A _____

Leaf B _____ [2]

(c) Predict the effect of the following factors on the rate of photosynthesis.

(i) Low temperature _____

(ii) Excessive amount of water _____ [2]

(d) Water is required for photosynthesis.

(i) Describe how the plant takes up water into its roots.

_____

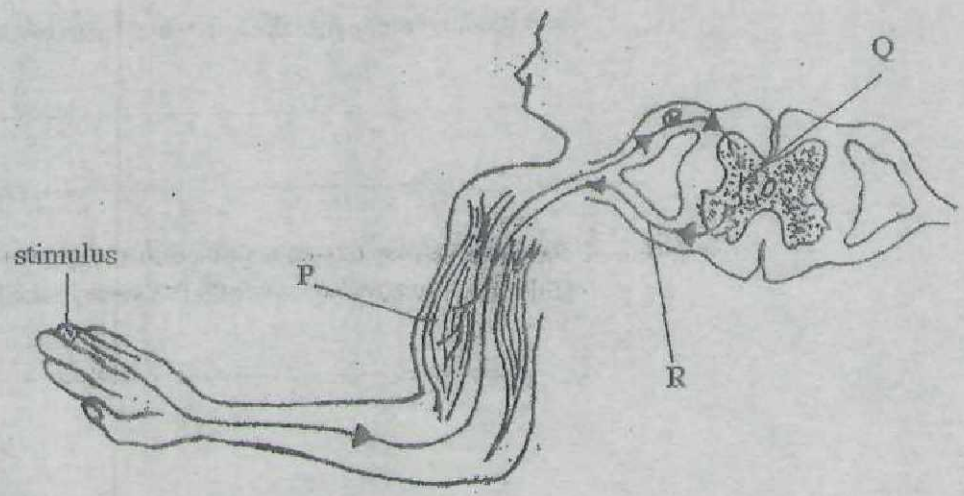
_____ [2]

(ii) Name the process that takes place in the leaves of the plant which is responsible for drawing water up the stem to the leaves.

_____ [1]

Total marks [10]

7. The diagram below represents a simple reflex action.



(a) Identify from the diagram

(i) the stimulus. _____

(ii) the response. _____ [2]

(b) (i) Which part of the central nervous system is involved with this reflex action?

_____ [1]

(ii) Name the parts labelled:

P _____

Q _____

R _____ [3]

(c) Describe and explain how the reflex action would be affected if part **R** was cut.

_____

_____ [2]

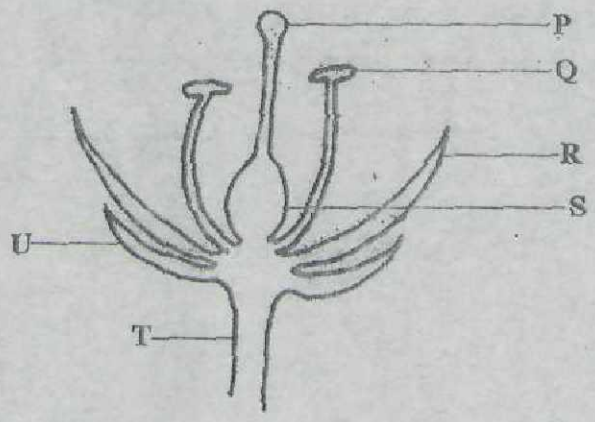
(d) What is the difference between the action described in the diagram and you deciding when best to cross the road?

_____

_____ [2]

Total marks [10]

8. The diagram represents a half flower.



(a) Name the parts of the flower marked **P**, **R**, **S**, **T** and **U**.

P _____ **R** _____

S _____ **T** _____

U _____ [3]

(b) (i) Name the type of cell division that occurs in **Q**.

_____ [1]

(ii) Name the specialized cells produced in **S**.

_____ [1]

(c) Give the letter of the structure that produces a substance that may become attached to visiting bees.

_____ [1]

(d) State the function of:

P _____

R _____ [2]

(e) Explain the events which occur in the flower between pollination and fertilization.

_____

_____

_____ [3]

Total marks [11]

End]

3009/3 BGCSE

School Number	Candidate Number
Surname and Initials	

BIOLOGY

PAPER 3 3009/3

Friday **23 MAY 2008** 12.30 – 2.00 P.M.

Additional materials:
Answer Booklet

MINISTRY OF EDUCATION
NATIONAL EXAMINATIONS

BAHAMAS GENERAL CERTIFICATE OF SECONDARY EDUCATION

INSTRUCTIONS AND INFORMATION FOR CANDIDATES

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

Answer **ALL** questions in Section A(1 - 4) in the space provided.

Answer two (2) out of three (3) questions in Section B on the sheets provided, which must be attached to the back of the question paper.

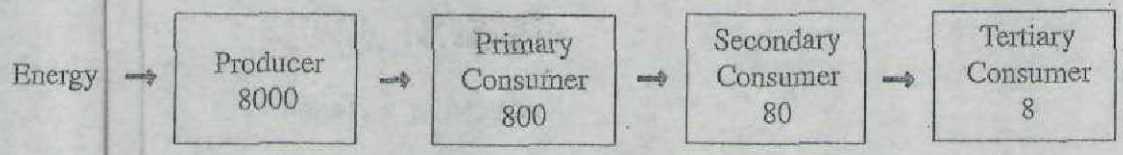
Candidates are advised to spend no more than 35 minutes on Section A.

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

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

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

1. The diagram below shows the flow of energy in kilojoules through a food chain.



(a) (i) Name the source of energy entering the food chain.

_____ [1]

(ii) In what form does this energy enter the producers?

_____ [1]

(iii) Name the pigment which first absorbs this energy.

_____ [1]

(b) Explain the reason for the changes in energy in the four trophic levels shown on the diagram above.

_____

_____

_____

_____

_____

_____

_____ [4]

(c) Decomposers are an important group of organisms in an ecosystem. Explain why they are important.

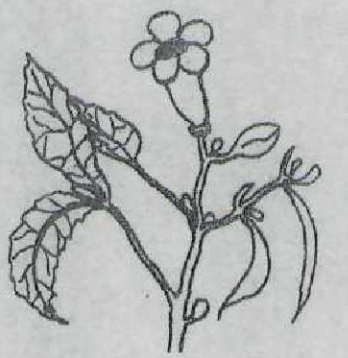
_____

_____

_____ [3]

Total marks [10]

2. The diagram shows the leaves, flower and fruit of *Tecoma stans* (Yellow Elder).



(a) (i) Name the process which makes food for this organism.

_____ [1]

(ii) On the diagram, draw a line to identify the fruit and label it **P**. [1]

(iii) Name the structure that produces branches from the main stem.

_____ [1]

(b) Using the diagram classify the Yellow Elder plant.

Explain your answer.

_____

_____

_____

_____ [3]

(c) Yellow Elder is a plant that was introduced to The Bahamas but now grows in the wild.

State **THREE** factors that may have contributed to its continued presence.

_____

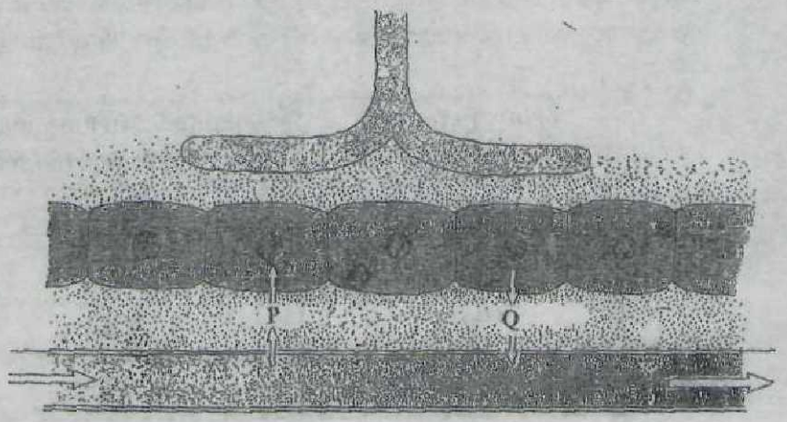
_____

_____

_____ [3]

Total marks [9]

3. The diagram shows the blood cells and tissue cells close to a lymph vessel.



(a) Arrows **P** and **Q** show substances moving in and out of the capillary.

Name the substances indicated by the letters **P** and **Q**.

P _____

Q _____ [2]

(b) (i) Explain how lymph is formed.

_____

_____ [2]

(ii) Label the lymph vessel and draw arrows to show the direction of lymph flow. [2]

(iii) State **TWO** ways that tissue fluid is different in composition from lymph.

_____

_____ [2]

(c) Explain how lymph nodes defend the body against foreign materials and invading bacteria.

_____

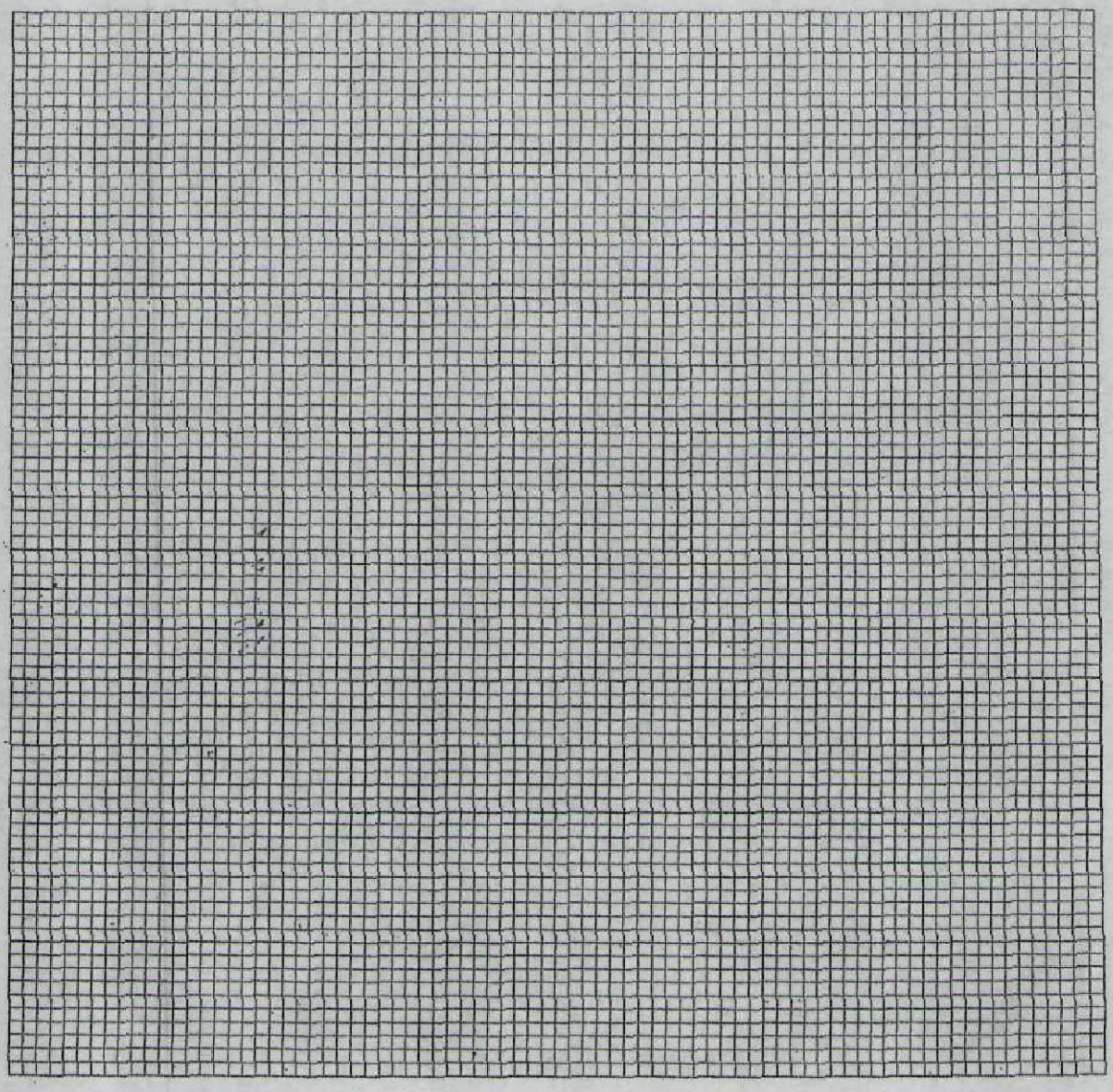
_____ [2]

Total marks [10]

4. Following a period of exercise, a man drank one litre of water and urine was collected at thirty-minute intervals immediately after exercising. Before drinking the water the man produced 60 ml(cm^3) of urine every thirty minutes.

Time in minutes (after drinking water)	Volume of urine collected per 30 minutes in ml(cm^3)
0	60
30	342
60	443
90	215
120	60
150	110
180	58
210	43

(a) Draw a line graph to show the results in the table. [4]



(b) Using the graph, determine the **total** amount of urine released after

(i) 30 minutes _____

(ii) 80 minutes _____

(iii) 100 minutes _____ [3]

7. *Describe in detail the sequence of events which leads to each of the following* responses:

(a) the withdrawal of the hand away from a hot object. [10]

(b) the changes in the iris when a person enters a dimly-lit room from a well-lit area. [5]

(c) the growth of the shoot of a flowering plant towards one directional light. [5]

Total marks [20]

SECTION B

Answer any **TWO** questions

5. (a) State **THREE** structural differences between xylem and phloem vessels. [3]

(b) Explain how the flow of materials in xylem is different from the flow of materials in phloem. [2]

(c) (i) State why it is impossible for xylem cells to rely on active transport. [2]

(ii) Explain the mechanism for water uptake. [5]

(d) Explain how each of the following affects the rate of transpiration of a plant like the Red Mangrove.

(i) thick leathery leaves [3]

(ii) thickened cuticle [2]

(iii) leaves drop during dry season [3]

Total marks [20]

6. (a) Explain **THREE** differences between aerobic and anaerobic respiration. [6]

(b) Describe an experiment which could be performed to show that yeast cells produce carbon dioxide. [6]

(c) Explain how yeast is used in **TWO** different named local industries. [6]

(d) *Suggest* **TWO** *reasons why an athlete makes use of anaerobic respiration to* complete a race. [2]

Total marks [20]

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