

50.

A Royal Bahamas Defence Force marine sees the flare from a distress rocket in the sky and 5 seconds later he hears the blast.

How far is the distress rocket from the marine? (speed of sound in air = 330 m/s)

- A. 66 m
- B. 825 m
- C. 335 m
- D. 1 650 m

3102/1

BGCSE

School Number				Candidate Number			
Surname and Initials							

COMBINED SCIENCE

PAPER 1 3102/1

Tuesday **27 MAY 2014** 12:00 Noon–1:15 P.M.

No additional materials required.

MINISTRY OF EDUCATION NATIONAL EXAMINATIONS

BAHAMAS GENERAL CERTIFICATE OF SECONDARY EDUCATION

INSTRUCTIONS 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 this paper.

There are **FIFTY** questions on this paper.

Attempt **ALL** questions.

For each question, there are **FOUR** possible answers labelled A, B, C and D. Choose the **ONE** you consider correct and record your choice by circling the **LETTER** next to the answer of your choice in the booklet.

A copy of the Periodic Table is printed on page 2.

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

FOR EXAMINER'S USE ONLY	
Total Marks	

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

The Periodic Table of the Elements

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*58-71 Lanthanoid series
†90-103 Actinoid series

Key

A square with vertices labeled **a** (top), **b** (bottom), **c** (left), and **d** (right). The center of the square is labeled **X**.

a = relative atomic mass

X = atomic symbol

b = proton (atomic) number

140 Ce Cerium 58	141 Pr Praseodymium 59	144 Nd Neodymium 60	Pm Promethium 61	150 Sm Samarium 62	152 Eu Europium 63	157 Gd Gadolinium 64	159 Tb Terbium 65	162 Dy Dysprosium 66	165 Ho Holmium 67	167 Er Erbium 68	169 Tm Thulium 69	173 Yb Ytterbium 70	175 Lu Lutetium 71
232 Th Thorium 90	Pa Protactinium 91	238 U Uranium 92	Np Neptunium 93	Pu Plutonium 94	Am Americium 95	Cm Curium 96	Bk Berkelium 97	Cf Californium 98	Es Einsteinium 99	Fm Fermium 100	Md Mendelevium 101	No Nobelium 102	Lr Lawrencium 103

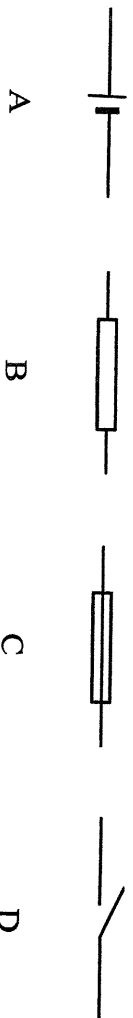
1. What is the process by which living organisms get rid of metabolic wastes?

- A. digestion
- B. excretion
- C. nutrition
- D. respiration

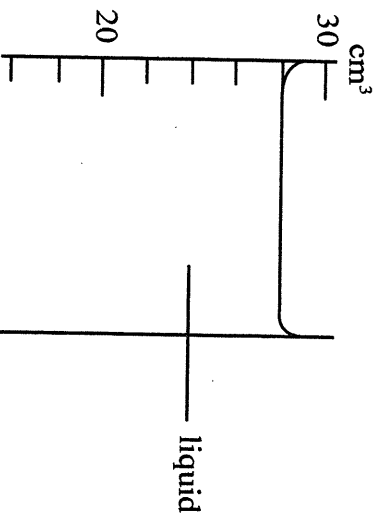
2. At which level of organisation is the kidney?

- A. cell
- B. organ
- C. system
- D. tissue

3. What is the symbol for a switch?



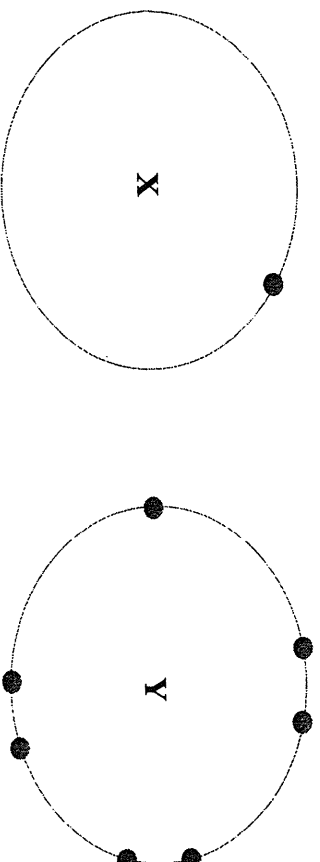
4. The diagram shows the level of a liquid in a measuring cylinder.



What is the volume of the liquid?

- A. 24 cm³
- B. 28 cm³
- C. 29 cm³
- D. 32 cm³

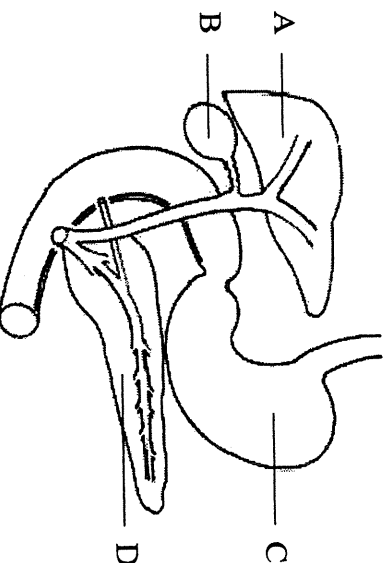
5. Diagrams X and Y represent the outer orbits of TWO different atoms.



What will be the formula of the compound they form after bonding?

- A. XY
- B. XY_2
- C. X_2Y
- D. XY_3

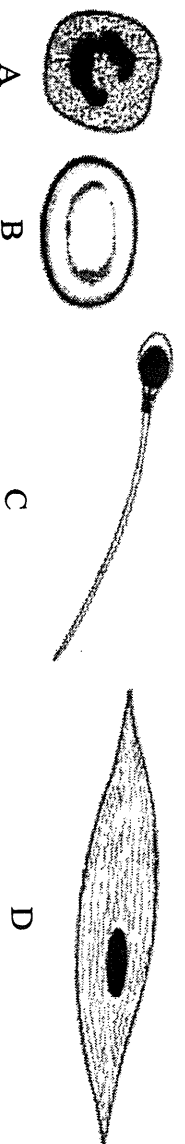
6. The diagram shows organs in the human alimentary canal.



Which labelled structure stores bile?

7. The diagram shows four cells found in the human body.

Which cell transports oxygen around the body?



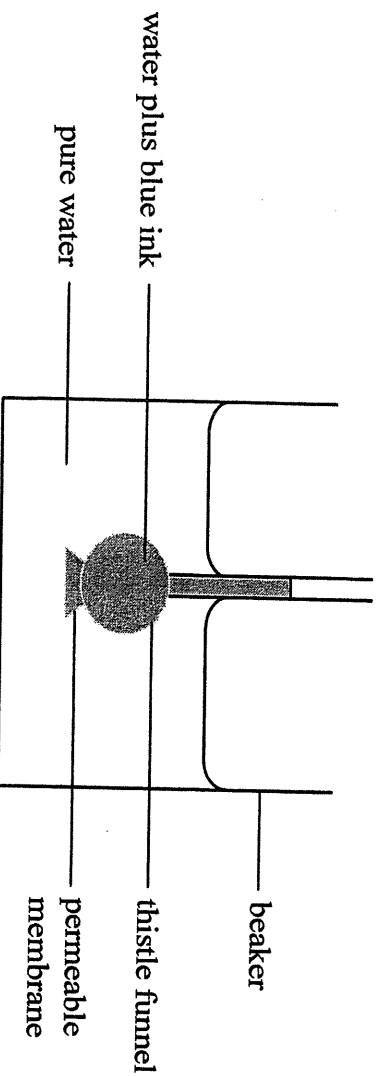
16. Which process clearly suggests that matter is made up of particles which are always in motion?

A. combustion
B. melting
C. diffusion
D. neutralisation

17. Which period of the Periodic Table contains sodium?

A. Period 1
B. Period 3
C. Period 4
D. Period 5

18. The apparatus was set up as shown in the diagram.

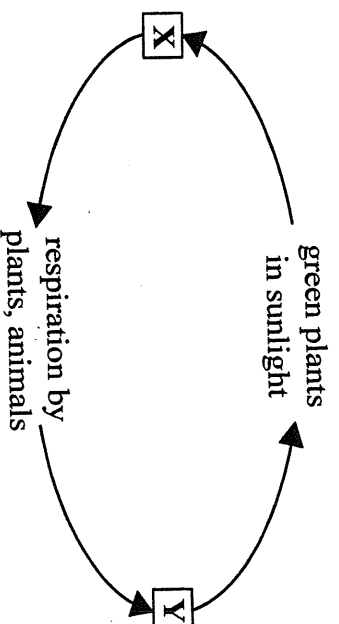


Some hours later the water in the beaker had turned blue.

Which process caused this colour change?

A. assimilation
B. diffusion
C. excretion
D. osmosis

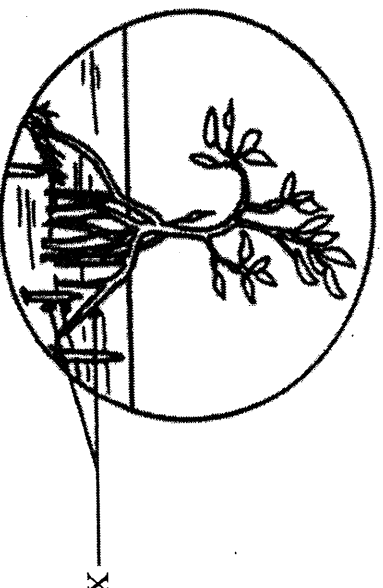
19. The diagram shows a part of the carbon cycle.



What are the gases at X and Y?

	X	Y
A.	carbon dioxide	oxygen
B.	carbon dioxide	water vapour
C.	oxygen	carbon dioxide
D.	oxygen	water vapour

20. What have structures X, on the mangrove plants been adapted for?



- A. osmosis
 B. photosynthesis
 C. respiration
 D. transportation

21. Which of the following is a chemical change?

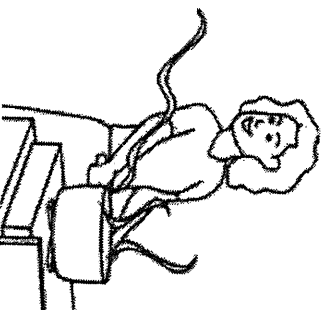
- A. oxygen dissolving in water
- B. iron rusting in water
- C. lead melting
- D. water evaporating

22. Which statement best describes what happens to water particles when the water freezes?

- A. they lose energy and escape into the atmosphere
- B. they lose energy and lose freedom to move about
- C. they gain energy and break up into atoms of hydrogen and oxygen
- D. they gain energy and gain freedom to move about

23. The diagram shows a woman holding a hot pot on a stove.

Although the pan is hot, the handle is cool.



Which material was used for the handle?

- A. aluminium
- B. copper
- C. iron
- D. wood

24. Where there is an electric current in a conductor, there is always a flow of

- A. atoms
- B. electrons
- C. neutrons
- D. protons

25. The table shows some of the constituents present in equal quantities of **FOUR** foods.

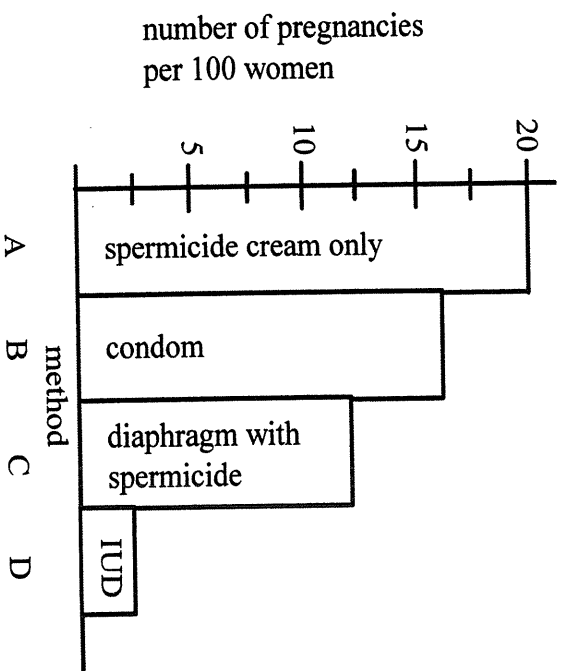
food	sugar/g	protein/g	fat/g	calcium/mg
chicken	0	4.8	0.9	4
jam	19.6	0.2	0	5
milk	1.2	0.9	1.0	34
peanuts	2.4	8.0	13.0	17

Which **TWO** foods provide the greatest amount of energy?

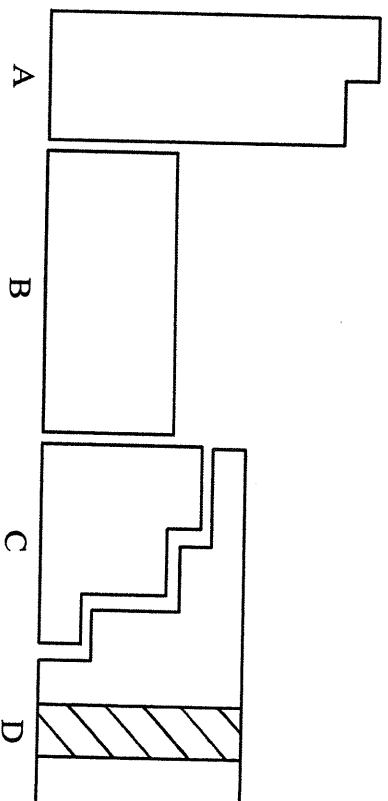
- A. chicken and milk
- B. jam and chicken
- C. milk and peanuts
- D. peanuts and jam

26. The graph shows the effectiveness of **FOUR** methods of contraception.

Which method of contraception can be considered the most effective?



Question 27 & 28 refer to the outlined diagram of the Periodic Table.



Which section of the Periodic Table contains

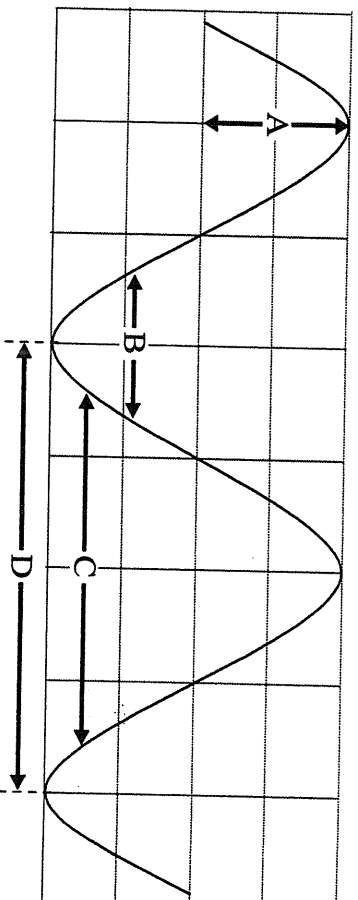
27. metals that form coloured, hydrated ions with variable valencies;

- A B C D

28. coloured gases?

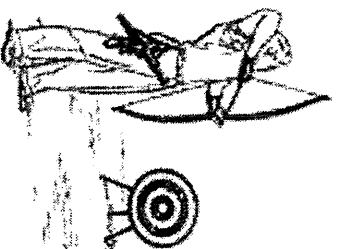
- A B C D

29. The drawing shows a wave.



Which letter represents the amplitude of the wave?

30. An archer is about to fire an arrow from a bow.



What type of energy is stored in the bow?

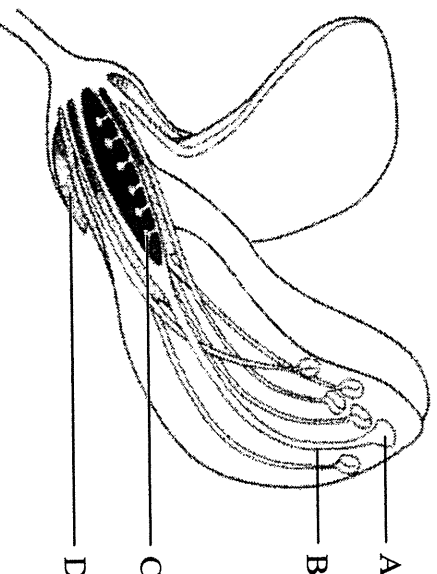
- A. chemical
- B. electrical
- C. heat
- D. potential

31. Which row matches the hormone with its function?

	hormone	function
A.	oestrogen	deepening of the voice
B.	oestrogen	development of hair in the arm pits
C.	testosterone	development of the mammary glands
D.	testosterone	enlargement of the pelvic girdle

32. The diagram shows a section through a flower.

Which labelled structure serves a protective function?



33. Which substance will produce a salt, water and carbon dioxide when reacted with dilute hydrochloric acid?

- A. magnesium
- B. magnesium oxide
- C. magnesium hydroxide
- D. magnesium carbonate

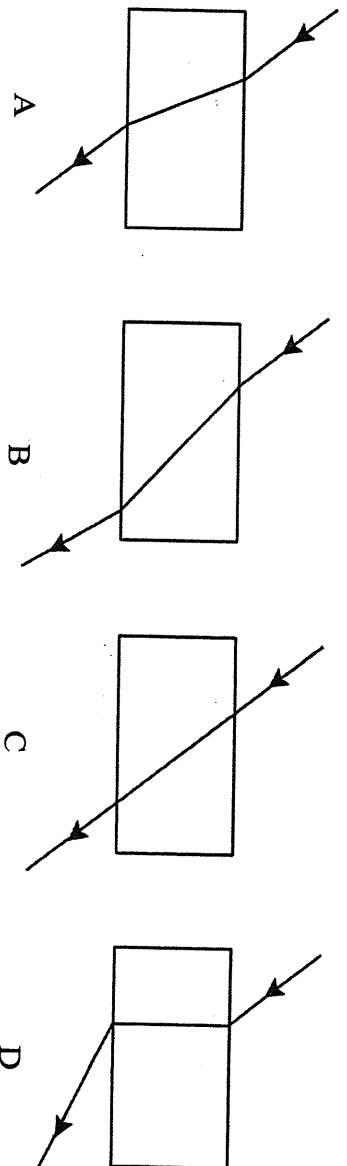
34.

Some factory wastes must be treated with alkali to make them safe before disposal. Which row in the table shows the pH change which should be made?

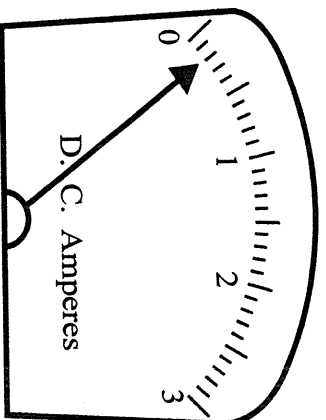
	pH before treatment	pH after treatment
A.	7	11
B.	11	7
C.	2	7
D.	7	2

35.

Which of the following diagrams correctly shows the path of a ray of light as it passes through a glass block?



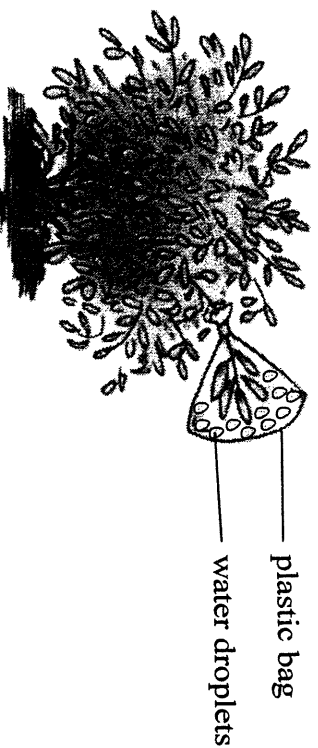
36. The diagram shows an ammeter measuring current in a circuit.



What is the current in the circuit?

- A. 0.002 A
- B. 0.2 A
- C. 2.0 A
- D. 2.5 A

37. The diagram from a camping book suggests a simple way to collect water.

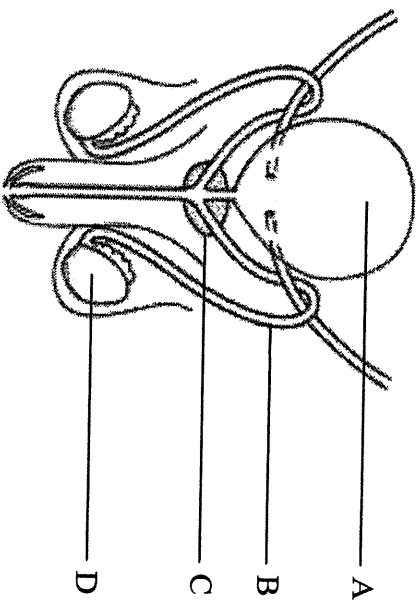


Which process causes **droplets** of water to collect in a bag?

- A. condensation
- B. crystallisation
- C. sublimation
- D. transpiration

38. The diagram represents the human male reproductive system.

Which part makes the gametes?

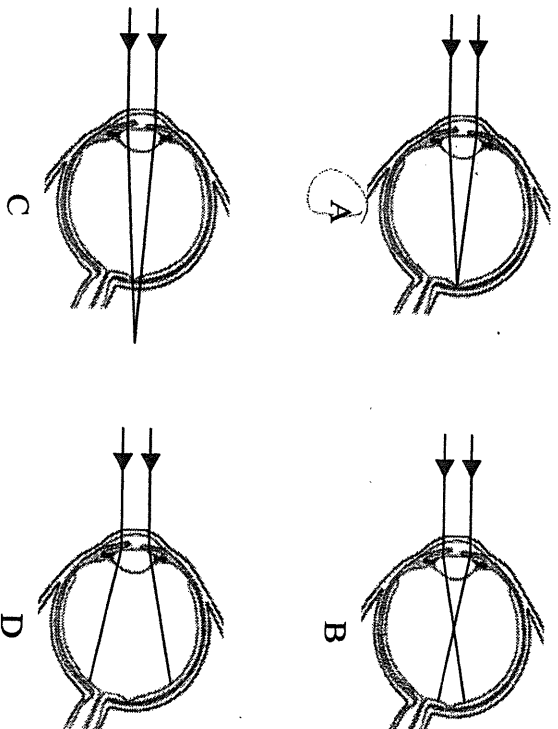


39. A mixture of gases contains helium, hydrogen, neon and nitrogen.

Which **two** gases in the mixture will diffuse the quickest?

- A. He and Ne
- B. H_2 and N_2
- C. H_2 and He
- D. Ne and N_2

40. Which diagrams show an image focused on the retina?



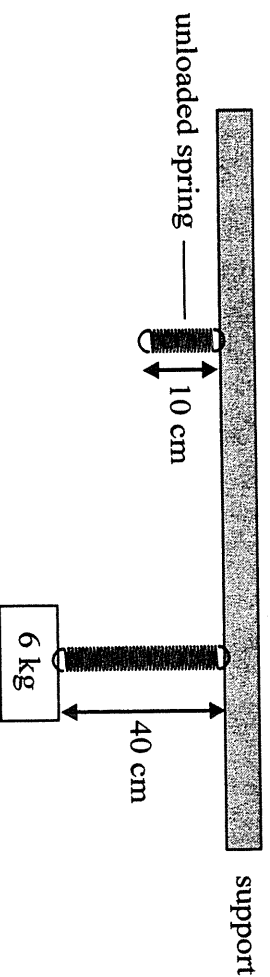
41. The table shows the temperature change when two salts are added to water.

salt	initial temperature of water/°C	final temperature of solution/°C
X	25.1	30.2
Y	27.4	20.9

Which statement about salts X and Y is true?

- A. dissolving of both salt X and salt Y is exothermic
- B. dissolving of both salt X and salt Y is endothermic
- C. dissolving of salt X is endothermic and dissolving of salt Y is exothermic
- D. dissolving of salt X is exothermic and dissolving of salt Y is endothermic

42. The diagram shows an unloaded spring hanging from a support and the same spring loaded with a 6 kg mass.



What will be the length of the spring when it is loaded with a 2 kg mass?

- A. 20 cm
- B. 30 cm
- C. 40 cm
- D. 60 cm

43. The diagrams show the fruits and seeds of **FOUR** different plants.

Which is dispersed by the wind?



Coconut



Poinciana



Shepherd's needle



Silk Cotton

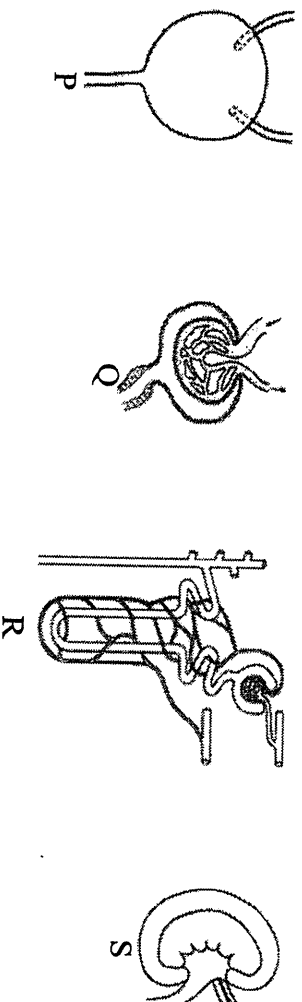
A

B

C

D

44. The diagram shows the urinary system and some of its structures.



Starting with the simplest, what is the order of complexity of the function of these structures?

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

45. A chemical reaction between a solid and an acid is too fast for safe use by a class of students.

Which set of changes is most likely to make the reaction safe for the class to use?

	pieces of solid	acid	temperature
A.	larger	less concentrated	lower
B.	larger	more concentrated	higher
C.	smaller	less concentrated	lower
D.	smaller	more concentrated	higher

46. The equation is not balanced.



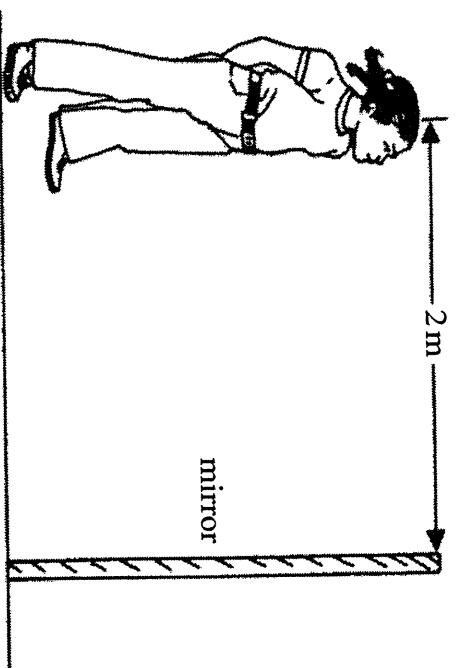
Which row of numbers for x, y, and z balance the equation?

	x	y	z
A	4	2	1
B	2	2	1
C	2	1	2
D	4	1	2

47. Which row shows **THREE** effects of adrenaline on a human?

	1	2	3
A	decreased heartbeat rate	decreased glucose in blood	small statue
B	decreased heartbeat rate	increased glucose in blood	small pupils
C	increased heartbeat rate	decreased glucose in blood	wide pupils
D	increased heartbeat rate	increased glucose in blood	wide pupils

48. A student stands 2 m in front of a plane mirror.



What will be the distance from the student to the virtual image?

- A. 2 m
- B. 4 m
- C. 6 m
- D. 8 m

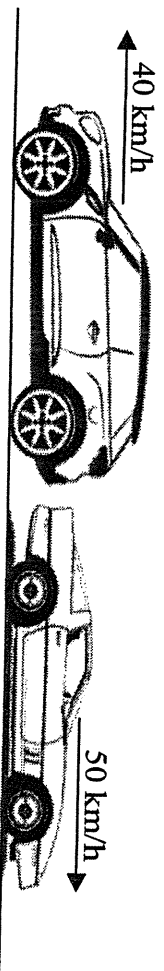
49. An enzyme in raw apples makes them go brown when they are peeled. This colour change is not observed in cooked apples.

Which property of enzymes explains this difference?

- A. enzymes are specific
- B. enzymes can be used over again
- C. enzymes work best at a particular pH
- D. enzymes are denatured by heat.

50.

Two cars start from the same point, at 5 am, travelling in opposite directions at 40 and 50 km/h respectively.



At what time will they be 450 km apart?

- A. 9 am
- B. 9 pm
- C. 10 am
- D. 10 pm

3102/1

BGCSE

Surname and Initials	School Number	Candidate Number

COMBINED SCIENCE

PAPER 1 3102/1

Wednesday 27 MAY 2015 12:00 Noon–1:15 P.M.

No additional materials required.

MINISTRY OF EDUCATION NATIONAL EXAMINATIONS

BAHAMAS GENERAL CERTIFICATE OF SECONDARY EDUCATION

INSTRUCTIONS 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 on this question booklet.

There are **FIFTY** questions on this paper.

Attempt **ALL** questions.

For each question, there are **FOUR** possible answers labelled A, B, C and D. Choose the **ONE** you consider correct and record your choice by circling the **LETTER** next to the answer of your choice in the booklet.

A copy of the Periodic Table is printed on page 2.

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

FOR EXAMINER'S USE ONLY	
Total Marks	

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

The Periodic Table of the Elements

85

The Periodic Table of the Elements

Group																										
												III	IV	V	VI	VII	0									
I	II																									
												<div>1 H Hydrogen 1</div>														4 He Helium 2
<div>7 Li Lithium 3</div>		<div>9 Be Beryllium 4</div>																<div>11 B Boron 5</div>	<div>12 C Carbon 6</div>	<div>14 N Nitrogen 7</div>	<div>16 O Oxygen 8</div>	<div>19 F Fluorine 9</div>	<div>20 Ne Neon 10</div>			
<div>23 Na Sodium 11</div>		<div>24 Mg Magnesium 12</div>																<div>27 Al Aluminium 13</div>	<div>28 Si Silicon 14</div>	<div>31 P Phosphorus 15</div>	<div>32 S Sulphur 16</div>	<div>35.5 Cl Chlorine 17</div>	<div>40 Ar Argon 18</div>			
<div>39 K Potassium 19</div>	<div>40 Ca Calcium 20</div>	<div>45 Sc Scandium 21</div>	<div>48 Ti Titanium 22</div>	<div>51 V Vanadium 23</div>	<div>52 Cr Chromium 24</div>	<div>55 Mn Manganese 25</div>	<div>56 Fe Iron 26</div>	<div>59 Co Cobalt 27</div>	<div>59 Ni Nickel 28</div>	<div>64 Cu Copper 29</div>	<div>65 Zn Zinc 30</div>	<div>70 Ga Gallium 31</div>	<div>73 Ge Germanium 32</div>	<div>75 As Arsenic 33</div>	<div>79 Se Selenium 34</div>	<div>80 Br Bromine 35</div>	<div>84 Kr Krypton 36</div>									
<div>85 Rb Rubidium 37</div>	<div>88 Sr Strontium 38</div>	<div>89 Y Yttrium 39</div>	<div>91 Zr Zirconium 40</div>	<div>93 Nb Niobium 41</div>	<div>96 Mo Molybdenum 42</div>	<div>96 Tc Technetium 43</div>	<div>101 Ru Ruthenium 44</div>	<div>103 Rh Rhodium 45</div>	<div>106 Pd Palladium 46</div>	<div>108 Ag Silver 47</div>	<div>112 Cd Cadmium 48</div>	<div>115 In Indium 49</div>	<div>119 Sn Tin 50</div>	<div>122 Sb Antimony 51</div>	<div>128 Te Tellurium 52</div>	<div>127 I Iodine 53</div>	<div>131 Xe Xenon 54</div>									
<div>133 Cs Caesium 55</div>	<div>137 Ba Barium 56</div>	<div>139 La Lanthanum 57</div>	<div>178 Hf Hafnium 72</div>	<div>181 Ta Tantalum 73</div>	<div>184 W Tungsten 74</div>	<div>186 Re Rhenium 75</div>	<div>190 Os Osmium 76</div>	<div>192 Ir Iridium 77</div>	<div>195 Pt Platinum 78</div>	<div>197 Au Gold 79</div>	<div>201 Hg Mercury 80</div>	<div>204 Tl Thallium 81</div>	<div>207 Pb Lead 82</div>	<div>209 Bi Bismuth 83</div>	<div>209 Po Polonium 84</div>	<div>209 At Astatine 85</div>	<div>209 Rn Radon 86</div>									
<div>Fr Francium 87</div>	<div>226 Ra Radium 88</div>	<div>227 Ac Actinium 89</div>																								
										</																

*58-71 Lanthanoid series
†90-103 Actinoid series

Key

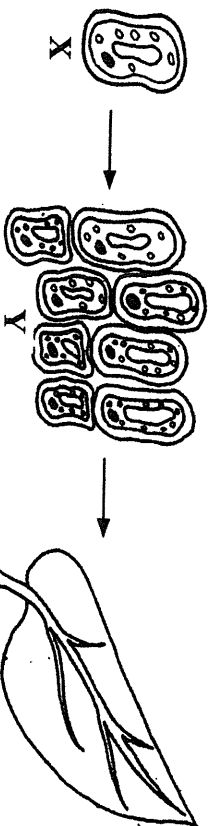
a	a = relative atomic mass
X	X = atomic symbol
b	b = proton (atomic) number

140 Ce Cerium 58	141 Pr Praseodymium 59	144 Nd Neodymium 60	Pm Promethium 61	150 Sm Samarium 62	152 Eu Europium 63	157 Gd Gadolinium 64	159 Tb Terbium 65	162 Dy Dysprosium 66	165 Ho Holmium 67	167 Er Erbium 68	169 Tm Thulium 69	173 Yb Ytterbium 70	175 Lu Lutetium 71
232 Th Thorium 90	Pa Protactinium 91	238 U Uranium 92	Np Neptunium 93	Pu Plutonium 94	Am Americium 95	Cm Curium 96	Bk Berkelium 97	Cf Californium 98	Es Einsteinium 99	Fm Fermium 100	Md Mendelevium 101	No Nobelium 102	Lr Lawrencium 103

1. What is the correct way to write the scientific name for modern man?

A *homo sapiens*
B *homo Sapiens*
C *Homo Sapiens*
D *Homo sapiens*

2. The diagram shows the level of organisation in a leaf.



What are structures X and Y?

A cell and tissue
B cell and organ
C tissue and organ
D organ and system

3. Which part of a cell controls all its activities?

A cytoplasm
B membrane
C nucleus
D vacuole

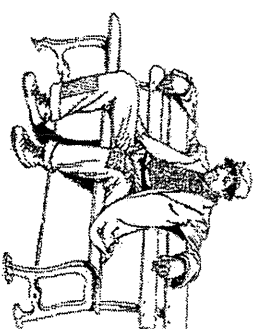
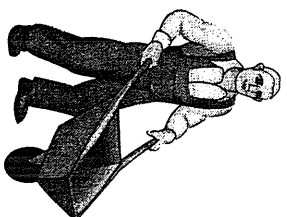
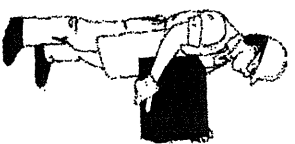
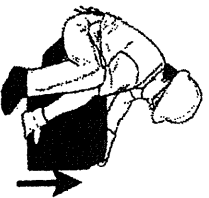
4. Which process involves only a physical change?

A dissolving salt in water
B mixing sodium with water
C souring of milk
D tarnishing of silver

5. Which piece of apparatus is used to measure the weight of an object?

A beam balance
B calipers
C pipette
D spring balance

6. Which picture shows work being done?



7. Which is likely to increase the likelihood of both tooth decay and gum disease?

- A eating crisp vegetables after meals
- B eating food containing refined sugar
- C eating food with low sugar content
- D regular brushing of teeth

8. Which one of the following is the best method of obtaining pure water from ink?

- A distillation
- B chromatography
- C filtration
- D freezing

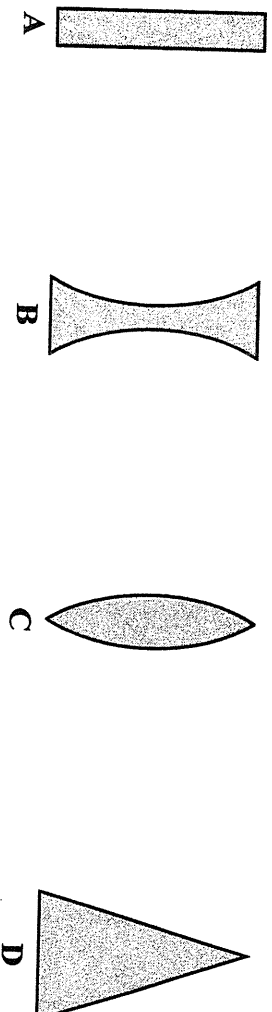
9. Which group of animals are cold-blooded with moist, soft skin?

- A amphibians
- B arthropods
- C fish
- D reptiles

10. How many electrons does the outer shell of the atom $^{31}_{15}\text{P}$ contain?

- A 1
- B 3
- C 5
- D 6

11. Which piece of glass causes light rays to converge?



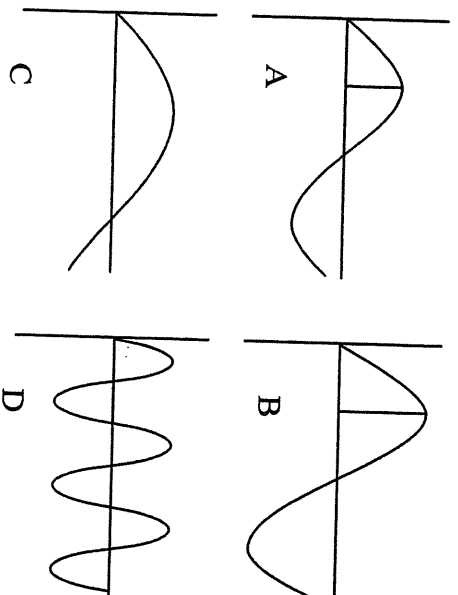
12. Which organism causes AIDS?

- A a bacterium
- B a fungus
- C a mosquito
- D a virus

13. Which members of the same group of organisms can produce fertile offspring with each other?

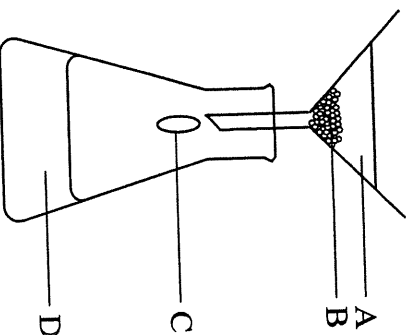
- A class
- B family
- C genus
- D species

14. Which mechanical wave has the greatest energy?



The diagram shows the apparatus used in separation of a mixture.

Questions 15 and 16 refer to the diagram.



15. Which process is shown in the diagram?

- A crystallization
- B distillation
- C evaporation
- D filtration

16. What would be collected at **D** if a mixture of sand and sea water was used?

- A salt
- B sand
- C salt and water
- D sand and salt

17. A new organism with the following characteristics is discovered:

- it is made of fine threads (hyphae),
- reproduces by spores and
- feeds saprophytically.

How should this organism be classified?

- A fungi
- B monera
- C protista
- D plant

18. What is the name of the gap found between neurones?

- A axon
- B dendrite
- C fatty sheath
- D synapse

19. Which stimulus are taste receptors sensitive to?

- A chemicals
- B friction
- C heat
- D water

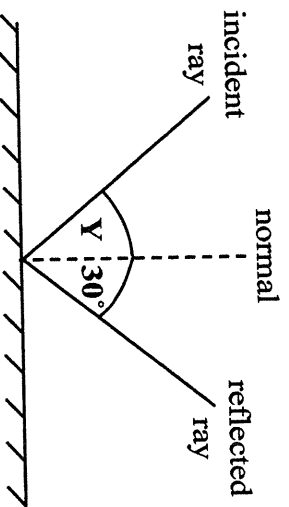
20. How many atoms of hydrogen are in **ONE** molecule of NH_4OH ?

- A 1
- B 3
- C 4
- D 5

21. Which wave is longitudinal?

- A microwave
- B radio wave
- C sound wave
- D water wave

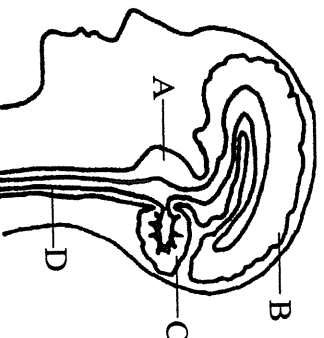
22. The diagram illustrates the reflection of light from a plane mirror.



What is angle Y?

- A 20°
- B 30°
- C 60°
- D 90°

The diagram shows a part of the Central Nervous System.



23. Which labelled structure of the diagram is concerned with conscious thought?
24. How are the processes of **alcoholic fermentation** and **aerobic respiration** similar?
- A both processes produce ethyl alcohol
 - B both processes release carbon dioxide
 - C both processes require free oxygen
 - D both processes utilise light

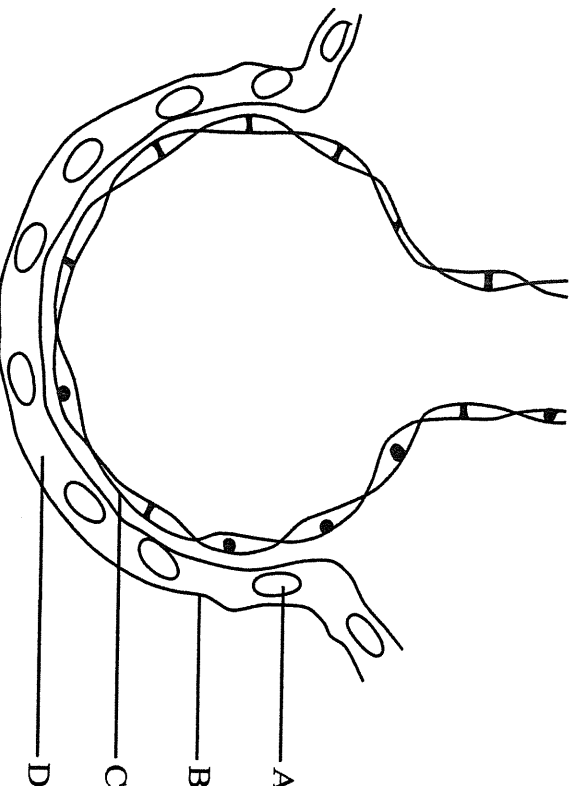
25. The table shows the gaseous composition of air.

gas	inspired air	expired air
oxygen	20%	16%
carbon dioxide	0.03%	4.0%
nitrogen	78%	78%

Which percentage of the inspired oxygen is being used in tissue respiration?

- A 10%
- B 20%
- C 25%
- D 50%

26. The diagram shows the structure of an alveolus.



Which labelled structure shows the gaseous exchange surface of the alveolus?

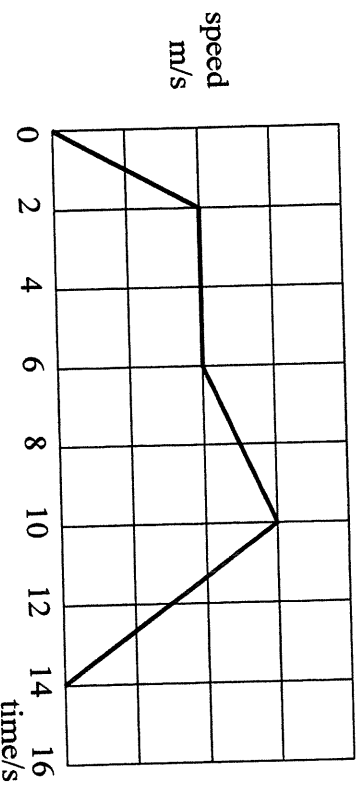
27. Which factor determines the reactivity of an atom?

- A number of electrons in the atom's valence shell
- B number of neutrons in the atom's nucleus
- C number of protons in the atom's nucleus
- D number of protons lost during the chemical reaction

28. Which electron arrangement is that of a metallic element?

A	2,1
B	2,4
C	2,5
D	2,7

29. The speed-time graph shows the journey of a cyclist.



During what time interval was the cyclist travelling at a constant speed?

A	0 s to 2 s
B	2 s to 6 s
C	6 s to 10 s
D	10 s to 14 s

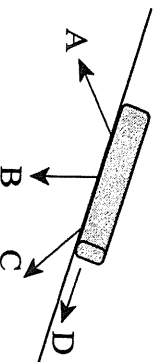
30. What is power?

A	a force which produces motion
B	the rate of change of energy
C	the rate of change of momentum
D	total work done

31. Which element is located in Group II, Period 3 of the Periodic Table?

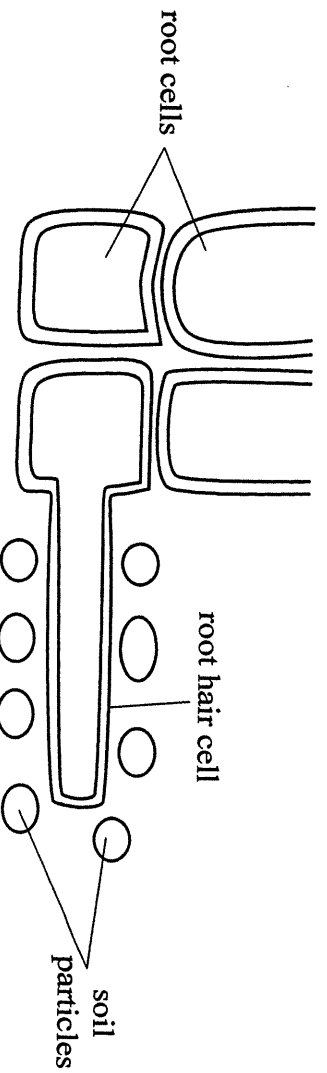
A	boron
B	helium
C	lithium
D	magnesium

32. The diagram shows a book resting on a slope.



In which direction does the weight of the book act?

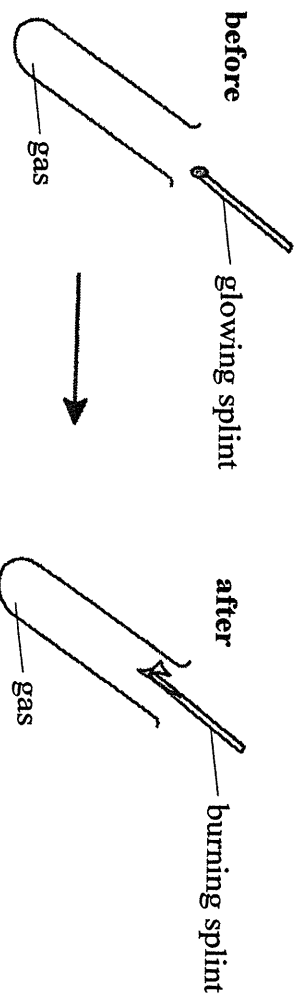
33. The drawing shows root cells in soil.



Which feature of the root hair cell helps it to absorb water faster?

- A dilute cell sap
- B large surface area
- C smaller chloroplasts
- D thick cell wall

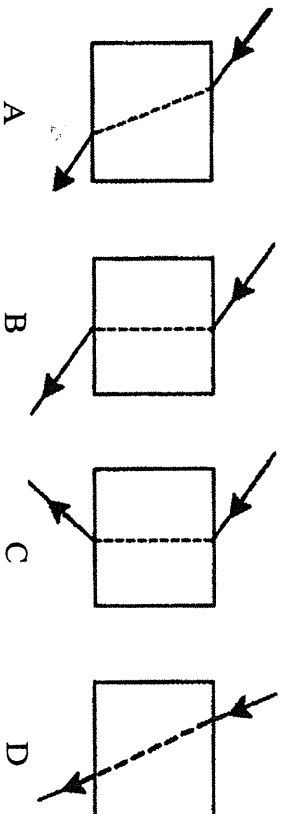
34. The diagram shows a test for a gas.



Which gas will this test identify?

- A ammonia
- B carbon dioxide
- C hydrogen
- D oxygen

35. Which diagram shows the path of a ray of light passing through a glass block?



36. The table shows the conditions which affect the rate of transpiration in plants.

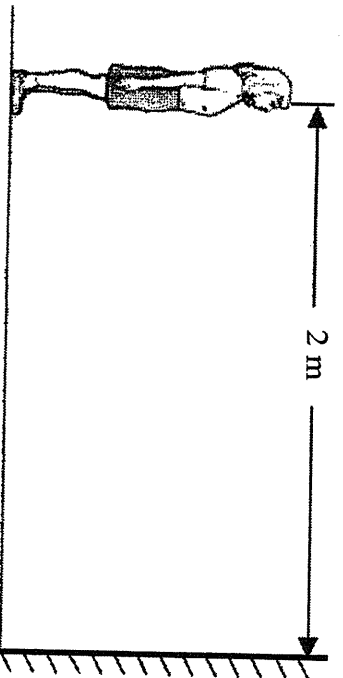
Which row shows the effect of changes in the external conditions on the rate of transpiration?

external conditions		transpiration rate
A	higher light intensity	decreases
B	higher temperature	decreases
C	lower light intensity	increases
D	higher temperature	increases

37. Which statement explains why noble gases are unreactive?

- A their atoms have uneven numbers of electrons
- B their atoms contain full outer shells of electrons
- C their outer shells contain eight electrons
- D they are all made of monatomic molecules

38. A student stands 2 m in front of a plane mirror.



What is the distance from the student to her image in the mirror?

- A 1 m
- B 2 m
- C 4 m
- D 8 m

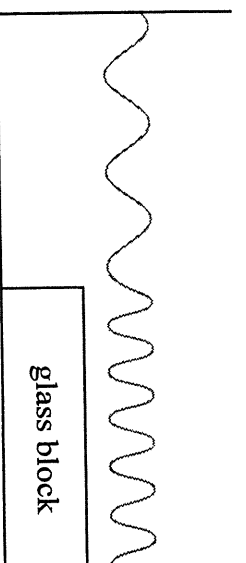
39. What does the developing fetus receive from its mother?

- A blood, oxygen and glucose
- B blood, urea and oxygen
- C carbon dioxide, urea and water
- D oxygen, glucose and water

40. Why are sodium and chlorine in the same period of the Periodic Table?

- A sodium is a reactive metal and chlorine is a reactive non-metal
- B sodium and chlorine combine to form a compound (NaCl)
- C the atoms of both elements have only three electron shells
- D the atoms of both elements have eight electrons in their second shell

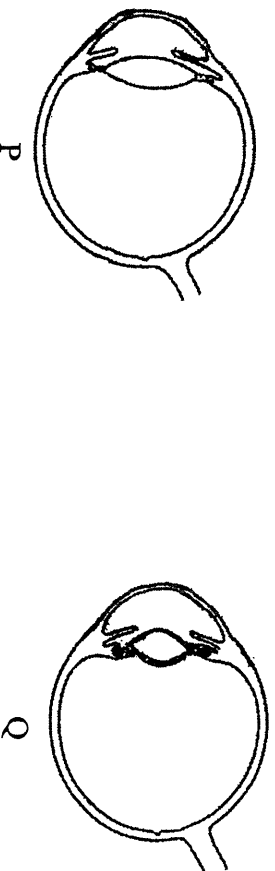
41. The diagram shows water waves in a ripple tank.



Which pair of quantities changes as the wave moves from deep to shallow water?

- A amplitude and speed
- B amplitude and wavelength
- C speed and wavelength
- D wavelength and frequency

42. The diagrams show changes in the human eye when looking at an object.



What has happened to the object to cause the change from **P** to **Q**?

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

43. A bee sting is said to be acidic.

Which household substance will neutralise a bee sting?

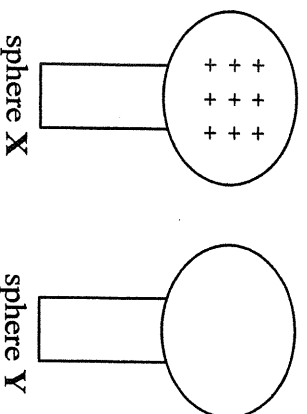
- A baking soda solution (pH 8)
- B damp table salt (pH 7)
- C lemon juice (pH 5)
- D vinegar (pH 4)

44. A decline in levels of which hormone is directly responsible for menstruation?

A oestrogen
B progesterone
C prolactin
D testosterone

45.

The diagram shows two identical metal spheres, X and Y. Sphere X has a positive charge and sphere Y is neutral. A student, who is earthed, touches sphere X and moves it close to, but not touching sphere Y.



What is the nature of the charges left on the two spheres?

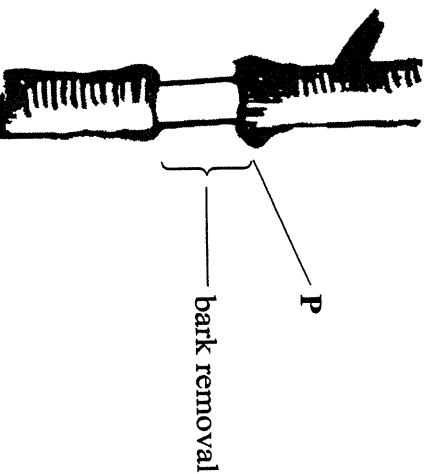
sphere X sphere Y

A positive positive
B neutral neutral
C positive negative
D negative positive

46. Why is water from the water tables of The Bahamas considered hard?

A contains pollutants
B contains sodium chloride
C contains ions of a Group II element
D contains a detergent

47. The diagram shows part of the stem of a woody plant with a section of bark removed.



What does structure P indicate has happened?

- A excretion
- B respiration
- C translocation
- D respiration

48. A Royal Bahamas Defence Force marine sees the flare from a distress rocket in the sky and 5 seconds later he hears the blast.

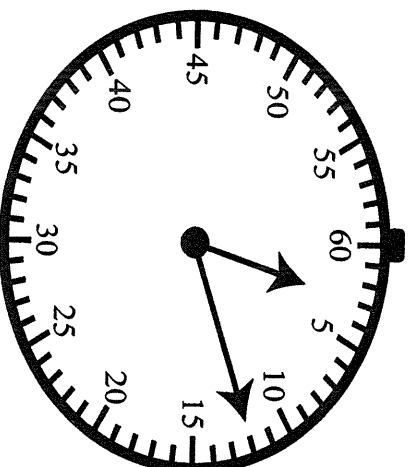
How far is the distress rocket from the marine? (speed of sound in air =330 m/s)

- A 66 m
- B 825 m
- C 335 m
- D 1 650 m

49. Which set of changes is most likely to make the reaction between a solid and an acid safe for use by students?

	solid form	acid	temperature
A	solid lumps	less concentrated	lower
B	solid lumps	more concentrated	higher
C	fine power	less concentrated	lower
D	fine power	more concentrated	higher

50. A student uses a stop clock to time an experiment.



What is the duration of the experiment if the clock started from zero?

- | | |
|---|-------|
| A | 12 s |
| B | 15 s |
| C | 193 s |
| D | 723 s |

