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COMBINED SCIENCE

PAPER 1 3102/1

Friday **26 MAY 2023** 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.

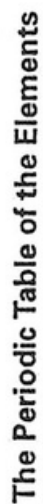
A copy of the Periodic Table is printed on page 2.

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

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Total Marks

This question paper consists of 18 printed pages and 2 blank pages.



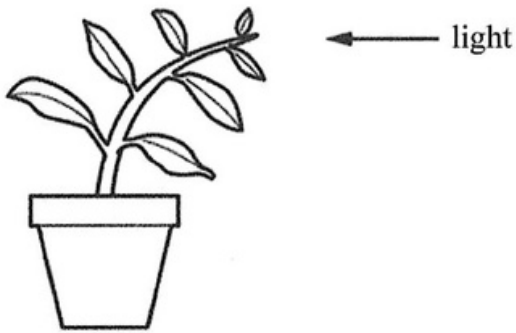
*58-71 Lanthanoid series
†90-103 Actinoid series

Key

a	X
----------	----------

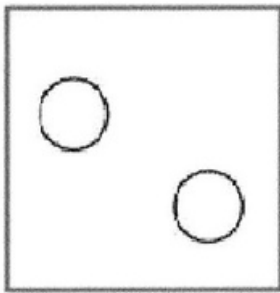
a = relative atomic mass
X = atomic symbol
b = proton (atomic) number

1. Which characteristic of living organisms is being shown in the diagram?

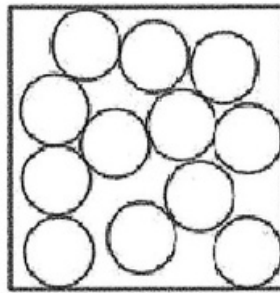


- A. excretion
- B. reproduction
- C. respiration
- D. sensitivity

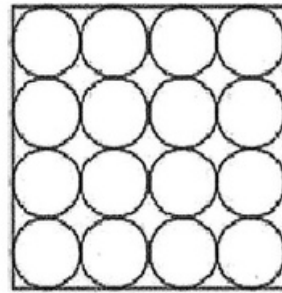
2. Diagrams X, Y and Z represent the three states of matter.



X



Y

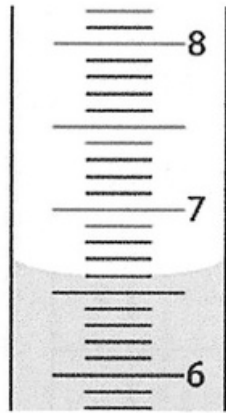


Z

Which change occurs when solid iodine changes to iodine gas?

- A. X to Z
- B. Y to X
- C. Z to X
- D. Z to Y

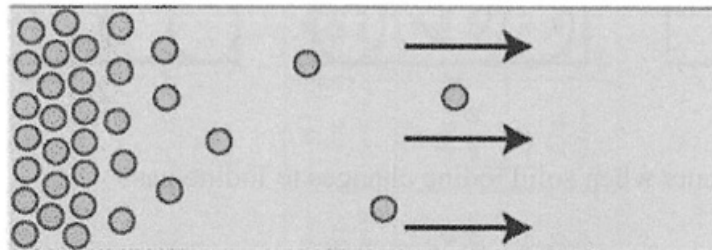
3. The diagram shows the level of a liquid in a measuring cylinder.



What is the volume of the liquid?

- A. 6.5 cm³
 - B. 6.6 cm³
 - C. 6.7 cm³
 - D. 6.8 cm³
4. The diagram shows how particles move and spread from one place to another.

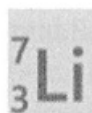
What is the name of the process shown?



- A. active transport
- B. diffusion
- C. evaporation
- D. osmosis



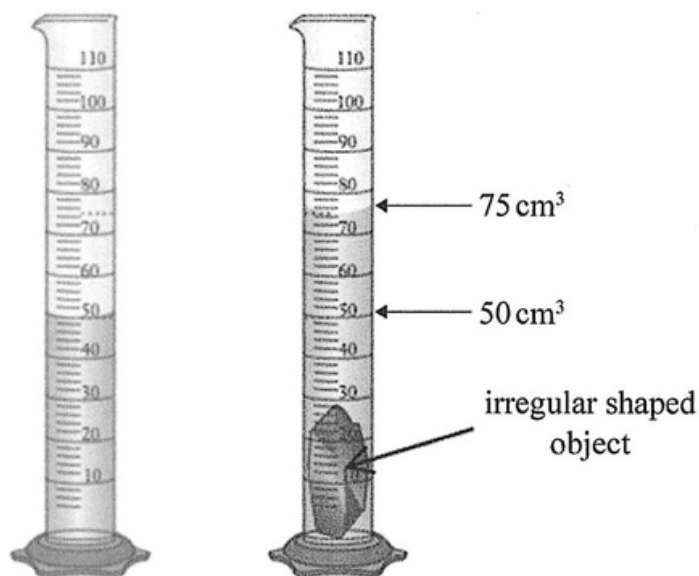
5. The atomic symbol for lithium is



Which row shows the number of protons, neutrons and electrons found in a lithium atom?

	Protons	Neutrons	Electrons
A.	3	4	3
B.	3	4	4
C.	4	3	3
D.	4	3	4

6. A stone is lowered into a graduated cylinder holding a volume of water equal to 50 cm^3 . The height of the water rose to 75 cm^3 .



The mass of the stone is 27g. Calculate the density of the stone.

- A. 0.92 g/cm^3
 B. 1.08 g/cm^3
 C. 1.85 g/cm^3
 D. 2.78 g/cm^3

7. A plant root cell absorbs water from the soil.

Which term best describes the process by which water moves from the soil into the cell?

- A. active transport
- B. diffusion
- C. evaporation
- D. osmosis

8. Which substance contains atoms which are all alike?

- A. compound
- B. element
- C. mixture
- D. solution

9. A biker rides west for 50 miles from his starting position, then turns and bikes back east for 80 miles.

What is his net displacement?

- A. 30 miles east
- B. 30 miles west
- C. 130 miles north east
- D. 130 miles north west

10. What type of substance acts as a catalyst to speed up chemical reactions in the body?

- A. antibody
- B. enzyme
- C. hormone
- D. vitamin

11. Which change occurs when an atom forms a positive ion?

- A. It gains electrons.
- B. It gains protons.
- C. It loses electrons.
- D. It loses protons.



12. Which piece of apparatus is used to measure the mass of an object?

- A. beaker
- B. beam balance
- C. conical flask
- D. thermometer

13. Which nutrient helps with growth and repair of body tissues?

- A. carbohydrates
- B. fats
- C. proteins
- D. water

14. Which formula is **not** correct for the compound given?

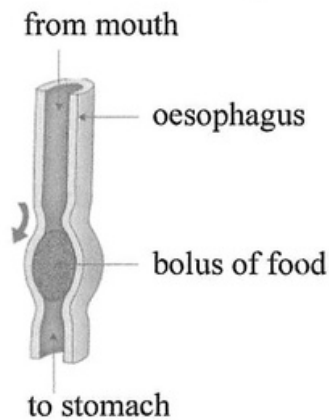
	Compound	Formula
A.	ammonia	NH_3
B.	calcium hydroxide	$\text{Ca}(\text{OH})_2$
C.	magnesium chloride	MgCl_2
D.	magnesium oxide	MgO_2

15. Why does convection take place in a liquid when it is heated?

- A. Liquids expand when they are heated.
- B. Liquids start to bubble when they get close to boiling point.
- C. Molecules in the liquid with more kinetic energy move and transfer heat.
- D. Molecules near to the surface of the liquid escape into the air.

16. The diagram shows a bolus of food passing from the mouth to the stomach through the oesophagus.

What is the name of the process occurring in the diagram?



- A. assimilation
B. diffusion
C. metabolism
D. peristalsis
17. Which statement about alloys is **not** correct?
- Alloys are....
- A. good conductors of electricity.
B. mixtures of different metals.
C. good conductors of heat.
D. not as strong as the metals from which they are made.
18. When building sidewalks, gaps are left between concrete slabs.

What does this compensate for?

- A. lower temperatures
B. radiation
C. thermal contraction
D. thermal expansion



19. What is the optimum pH for digestion in the stomach?

- A. pH2
- B. pH7
- C. pH9
- D. pH12

20. Which is the most acidic household chemical?

	Household chemical	pH
A.	baking soda	9
B.	vinegar	4
C.	milk	6
D.	dishwashing liquid	8

21. A force may produce a change in the characteristics of an object.

What is the set of characteristics that can be changed by a force?

- A. mass and size
- B. mass and volume
- C. shape and mass
- D. size and shape

22. Which activity can best aid in preventing a possible heart attack?

- A. eating too much
- B. moderate exercise
- C. overexertion
- D. smoking

23. Which physical property determines the separation technique used to separate a mixture of ethanol and water?

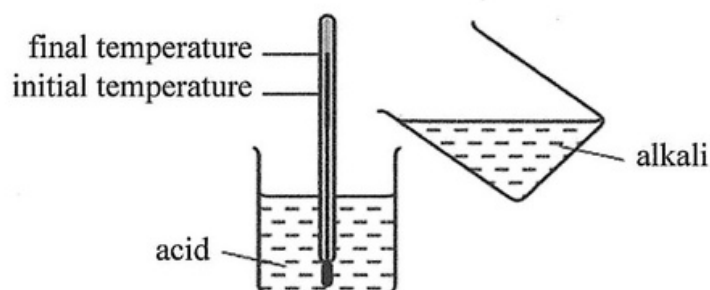
- A. boiling point
- B. density
- C. melting point
- D. solubility

24. Which is the equation used to calculate power?
- A. energy $\times$ time
 - B. force $\times$ acceleration
 - C. work $\div$ time
 - D. time $\div$ energy
25. Which is the major blood vessel that takes deoxygenated blood to the heart from the body?
- A. aorta
 - B. coronary artery
 - C. pulmonary vein
 - D. vena cava
26. Which is an example of a physical change?
- A. silver jewellery becoming tarnished
 - B. a metal fence rusting
 - C. iron being heated until it melts
 - D. hydrochloric acid breaking down metal
27. Which process converts the products of digestion into energy for cells?
- A. absorption
 - B. assimilation
 - C. photosynthesis
 - D. respiration



28. An acid and an alkali are mixed as shown in the diagram.

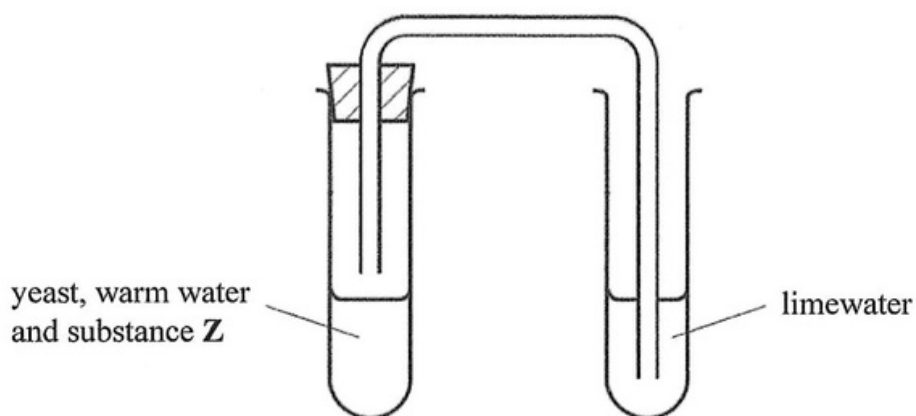
A reaction occurs and the temperature change is measured.



Which statement best describes the reaction?

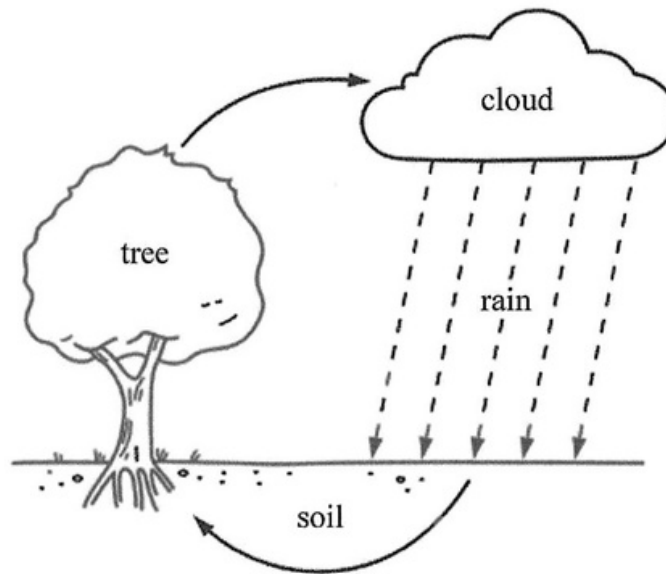
- A. The reaction is endothermic, the temperature decreases.
 - B. The reaction is endothermic, the temperature increases.
 - C. The reaction is exothermic, the temperature decreases.
 - D. The reaction is exothermic, the temperature increases.
29. Yeast, warm water and the substance **Z** were put into a test-tube. The apparatus was set up as shown. After a while, the limewater forms a white precipitate.

What is substance **Z**?



- A. alcohol
- B. carbon dioxide
- C. glucose
- D. oxygen

30. The diagram shows a simple water cycle.



What is responsible for water loss from a tree?

- A. evaporation
 - B. photosynthesis
 - C. respiration
 - D. translocation
31. How do sound waves travel in air?
- A. changes in air pressure
 - B. electromagnetic waves
 - C. infrared waves
 - D. vibrations in wires or string
32. Which organ is mainly responsible for the removal of urea from the body?
- A. heart
 - B. lungs
 - C. kidney
 - D. stomach



33. The table lists the melting points and the boiling points of four different substances.

Which substance is a liquid at 0 °C?

	Melting point /°C	Boiling point /°C
A.	- 219	- 183
B.	- 7	58
C.	98	890
D.	1083	2582

34. Which sensory organ has the ability to detect heat when you touch a hot pan?

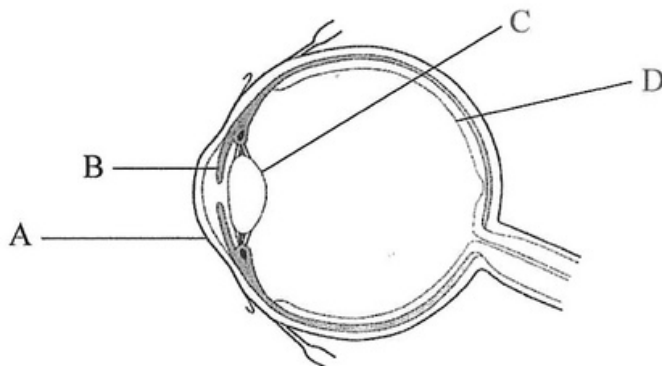
- A. ear
- B. eye
- C. nose
- D. skin

35. Which term is used to indicate the flow of electrons through a conductor?

- A. current electricity
- B. resistance
- C. static electricity
- D. voltage

36. The diagram shows a section through the human eye.

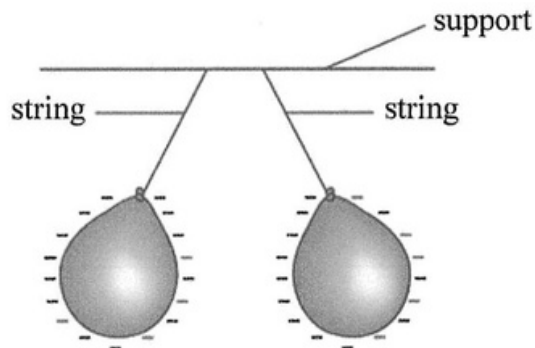
Which structure controls the size of the pupil?



37. A student ties two balloons to a support with some string.

Each balloon was rubbed with a dry cloth which gave them a negative charge.

The diagram represents what has happened to the balloons after they were rubbed.



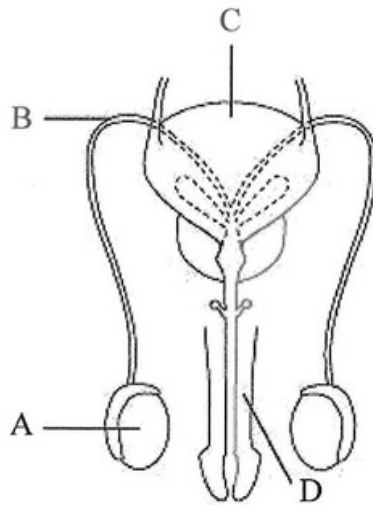
What causes the balloons to be charged like this?

- A. They gained electrons.
 - B. They lost electrons.
 - C. They gained protons.
 - D. They lost protons.
38. Which connective tissue attaches bones to each other at a moveable joint?
- A. cartilage
 - B. ligament
 - C. muscle
 - D. tendon
39. Which is the SI unit for potential difference?
- A. kilogram
 - B. pascal
 - C. joule
 - D. volt

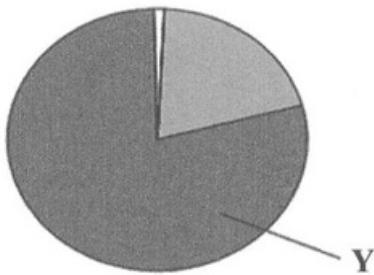


40. The diagram shown represents the human male reproductive system.

Which labelled structure produces the male gametes?



41. The diagram shows the percentage composition of gases found in the air.

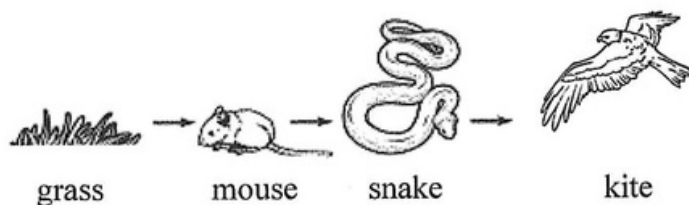


Which component of air is Y?

- A. carbon dioxide
 - B. oxygen
 - C. argon
 - D. nitrogen
42. Which is a unit of resistance?
- A. ampere
 - B. ohm
 - C. volt
 - D. watt



43. Which organism is the secondary consumer in this food chain?



- A. grass
B. kite
C. mouse
D. snake
44. The test results for a colourless liquid are shown.
- Boiling point = 100°C
 - White anhydrous copper(II) sulphate turns blue
- What is the colourless liquid?
- A. ethanol
B. hydrochloric acid
C. pure water
D. sodium chloride solution
45. The plug for an electric lamp contains a 3A fuse. The fuse's job is to protect the lamp if too much current flows.
- What will happen when the fuse does its job?
- A. The fuse burns and catches on fire.
B. The fuse directs the current back to its source.
C. The fuse reduces the current to 3A.
D. The fuse wire melts and breaks the circuit.
46. Which human activity can cause eutrophication of lakes?
- A. release of carbon dioxide
B. release of sulphur dioxide
C. use of fertilisers
D. use of pesticides



47. After some building work in a house, a bare (uninsulated) wire is left protruding from a wall.

What is the greatest hazard posed by the bare (uninsulated) wire?

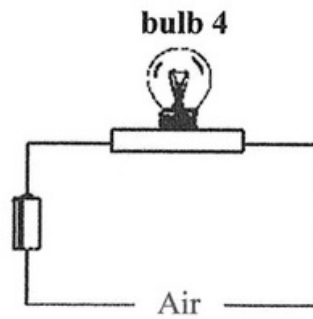
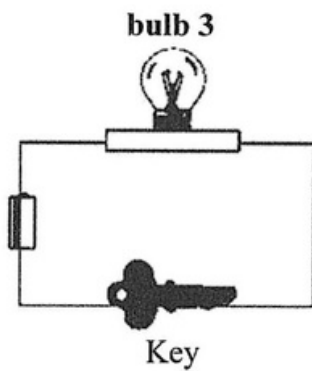
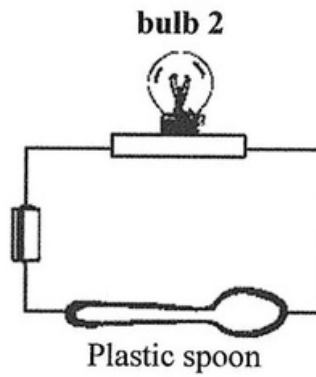
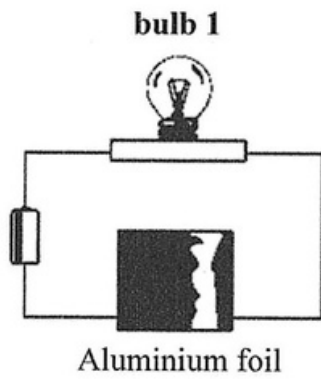
- A. A fuse may blow.
- B. A fire may start.
- C. No current flows.
- D. The neutral wire is grounded.

48. Why is it important to conserve natural resources?

- A. It does not take very long to make them again.
- B. They can be replaced when used up.
- C. They can decrease pollution.
- D. They cannot be replaced once used up.



49. Study the following diagrams.



Which bulbs would light up?

- A. 1 and 2 only
 - B. 1 and 3 only
 - C. 2 and 3 only
 - D. 3 and 4 only
50. Which is **not** an economic benefit of biotechnology?
- A. increased crop yield
 - B. increased production of medicines
 - C. increased use of pesticides
 - D. producing vaccines to fight diseases



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