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COMBINED SCIENCE

PAPER 1 3102/1

Thursday **17 JUNE 2021** 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.

Group

[illegible]

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

Key

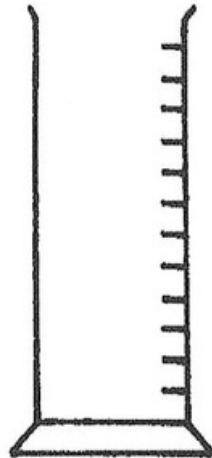
a	a = relative atomic mass
X	X = atomic symbol
b	b = proton (atomic) number

1. Which characteristic of living organisms enables them to detect and respond to stimuli?
 - A. excretion
 - B. growth
 - C. irritability
 - D. movement

2. Which characteristic is common to both birds and mammals?
 - A. covered with hair
 - B. covered with feathers
 - C. constant body temperature
 - D. takes on the temperature of their environment

3. Which of the following is a mixture?
 - A. steel
 - B. carbon dioxide
 - C. graphite
 - D. sodium chloride

4. The diagram shows a measuring cylinder.



What physical quantity does it measure?

- A. length
- B. mass
- C. volume
- D. weight



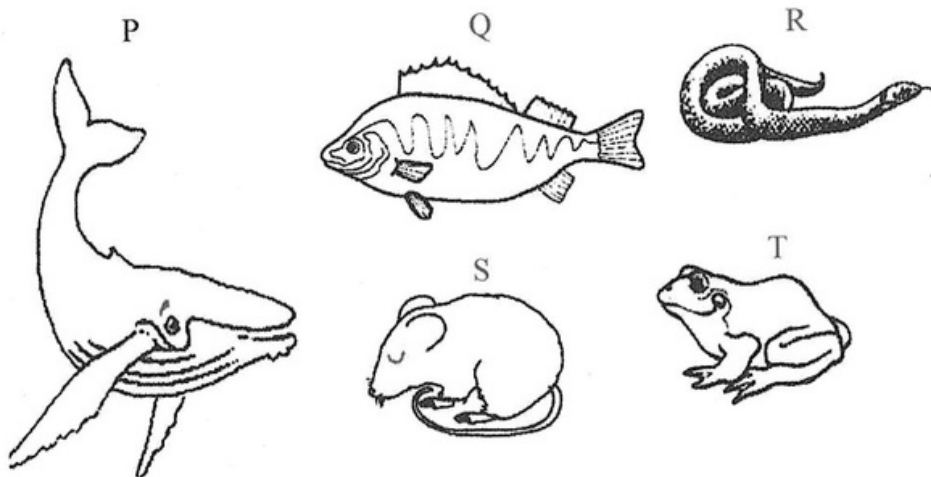
5. Which phrases best describe what occurs when a substance sublimates?

- A. chemical change, gas to solid
- B. chemical change, liquid to gas
- C. physical change, gas to liquid
- D. physical change, solid to gas

6. Which form of energy is stored in a battery?

- A. chemical
- B. electrical
- C. kinetic
- D. light

7. The diagram shows five animals.



Which organisms belong to the same class?

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



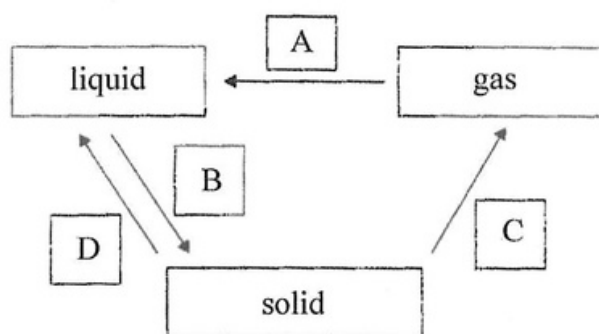
8. A simple food chain is described

green plant → herbivore → carnivore

If a disease causes the number of carnivores to decrease, what will be the effect on the numbers of green plants and herbivores?

	green plants	herbivores
A.	decrease	increase
B.	decrease	same
C.	increase	decrease
D.	increase	same

9. Which arrow represents condensation occurring?



10. What do the Roman numerals I–VII on the Periodic Table indicate about the elements?

- A. the total number of electrons
- B. the number of orbitals
- C. the number of paired electrons
- D. the numbers of electrons in outer shell

11. Which coloured surface will absorb the most radiant heat energy?

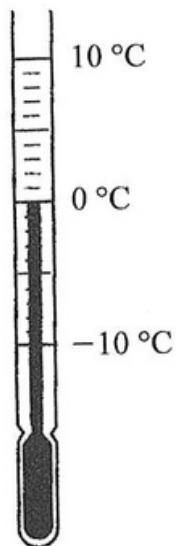
- A. black
- B. blue
- C. silver
- D. white



12. The mouth of an adult human contains **FOUR** of which type of teeth?

- A. canines
- B. incisors
- C. molars
- D. premolars

13. The thermometer below shows a reading on the Celsius scale.



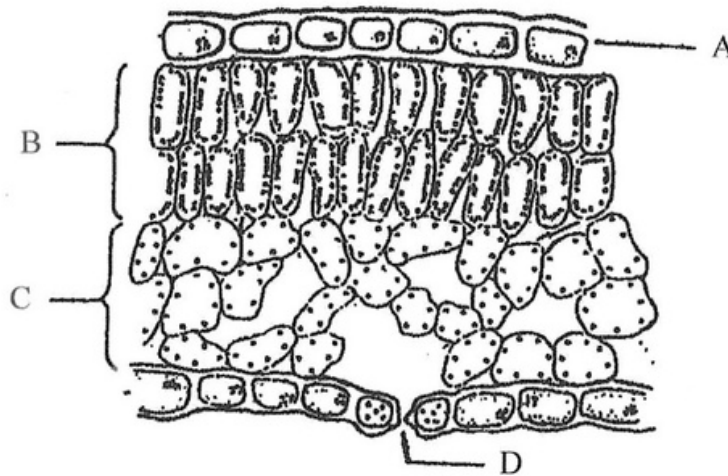
Which of the following is its equivalent reading on the Kelvin scale?

- A. 32 K
- B. 100 K
- C. 212 K
- D. 273 K

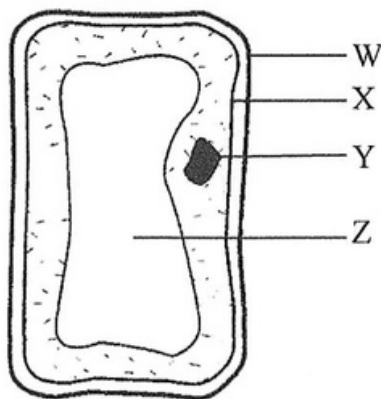


14. The diagram below represents a cross section of a leaf.

Through which labelled part does carbon dioxide enter the leaf?



15. The diagram shows a typical plant cell.



Which structures would NOT be found in an animal cell?

- A. W and Z
- B. W and X
- C. X and Y
- D. Y and Z

16. The Alkali Metals and Alkaline Earth Metals are found in the Periodic Table.

Which statement is **TRUE** about elements in both of these groups?

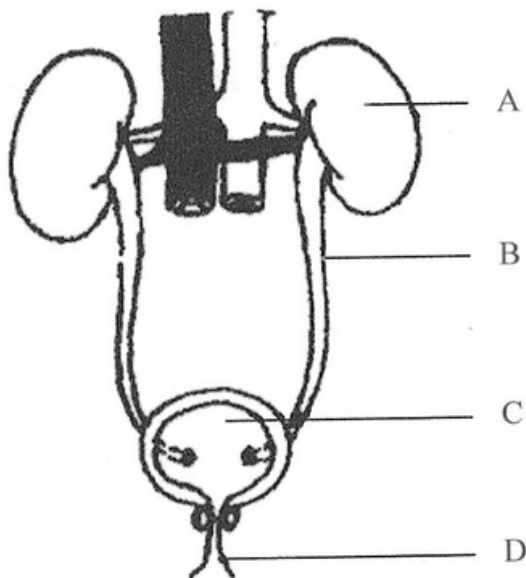
As the atomic numbers of the elements in these groups increase

- A. the elements become less reactive.
- B. the boiling point of the elements increases.
- C. the atomic radii of the atoms increase.
- D. the melting point of the elements increases.

17. The image formed on the human eye is

- A. real and erect.
- B. real and inverted.
- C. virtual and erect
- D. virtual and inverted.

18. Which labelled structure stores urine?



19. The chart below shows the nutrient composition of a food.

Food	Percentage
Carbohydrates	4.7
Proteins	3.3
Fats	3.8
Water	88.2

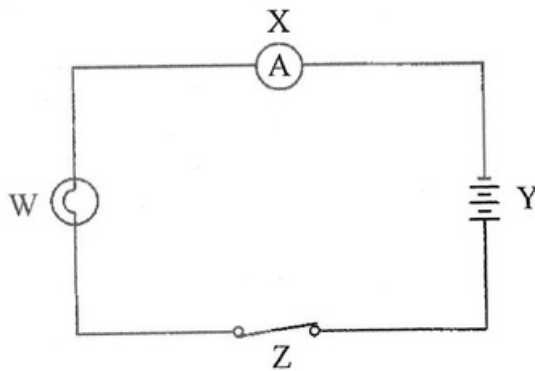
Which of the following foods has a similar composition?

- A. milk
B. potatoes
C. roasted beef
D. wheat bread
20. Which kingdom of organisms is made up of multicellular organisms that have cells with nuclei; can move and cannot make their own food?
- A. Animal
B. Fungi
C. Plant
D. Protista
21. Which atom has an ion with an electronic configuration of 2.8.8?
- A. argon
B. chlorine
C. fluorine
D. magnesium
22. Which element is likely to be the easiest to hammer into a particular shape without it shattering?
- A. graphite
B. chromium
C. silicon
D. sulphur

23. Which of the following is caused by air pollution?

- A. acid rain
- B. eutrophication
- C. increased photosynthesis
- D. natural disasters

24. The diagram represents an electric circuit.



Which labelled part has the function of breaking or completing the circuit?

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

25. Which will 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

26. Which of the following is the best source of dietary fibre?

- A. butter
- B. fish
- C. white rice
- D. whole wheat bread



27. Marble chips react with hydrochloric acid to form
- A. calcium chloride and hydrogen only.
 - B. calcium chloride and water only.
 - C. calcium chloride, carbon dioxide and hydrogen.
 - D. calcium chloride, carbon dioxide and water.
28. When a plastic rod is rubbed on a woollen cloth it becomes negatively charged. Which of the following explains this?
- A. The rod gained electrons.
 - B. The rod gained protons.
 - C. The rod lost electrons.
 - D. The rod lost protons.
29. Which number can replace X to balance the equation?
- $$2\text{H}_3\text{PO}_4(\text{aq}) + 3\text{Mg}(\text{OH})_{2(\text{aq})} \longrightarrow \text{X H}_2\text{O}_{(\text{l})} + \text{Mg}_3(\text{PO}_4)_{2(\text{aq})}$$
- A. 1
 - B. 2
 - C. 4
 - D. 6
30. Which action straightens the arm at the elbow joint?

	Biceps	Triceps
A.	contracts	contracts
B.	contracts	relaxes
C.	relaxes	contracts
D.	relaxes	relaxes

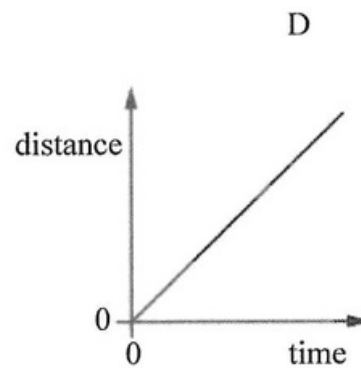
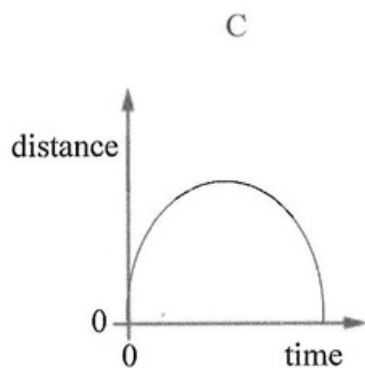
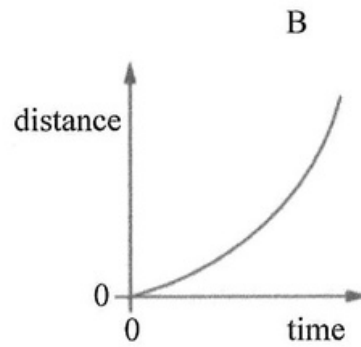
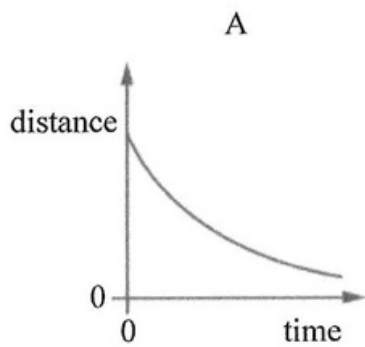
31. Which of the following is an example of a voluntary action?

- A. blushing
- B. salivation
- C. scratching
- D. sneezing

32. What is the colour of universal indicator in sodium hydroxide?

- A. purple
- B. green
- C. red
- D. pink

33. Which distance/time graph represents the motion of an object moving at constant speed?



34. What is the name given to neurones which carry messages from receptor organs to the central nervous system?
- A. intermediate neurones
 - B. motor neurones
 - C. relay neurones
 - D. sensory neurones

35. A motor cyclist travelled a distance of 20 km in 1 hour, followed by 15 km in 20 minutes, followed by 10 km in 10 minutes.

What is the average speed of the motor cyclist in km/h?

- A. 15 km/h
 - B. 20 km/h
 - C. 30 km/h
 - D. 45 km/h
36. Complete the word equation for the reaction between magnesium carbonate and sulphuric acid.

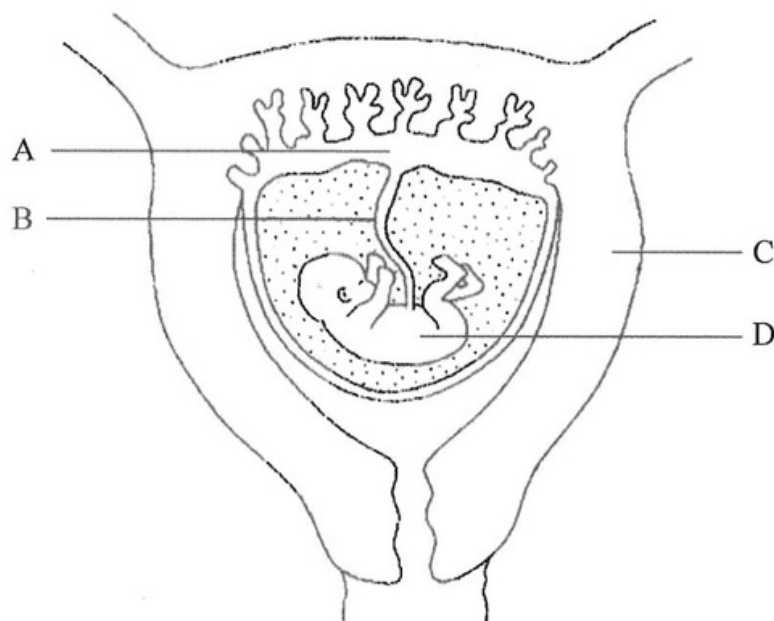
magnesium carbonate + sulphuric acid $\longrightarrow$

- A. magnesium sulphate + water
 - B. magnesium sulphate + water + carbon dioxide
 - C. magnesium sulphate + hydrogen + carbon dioxide
 - D. magnesium sulphate + hydrogen
37. When a metal block is heated its volume increases. Which row shows what happens to the mass and density of the block during this heating?

	Mass	Density
A.	decreases	same
B.	increases	same
C.	same	decreases
D.	same	increases



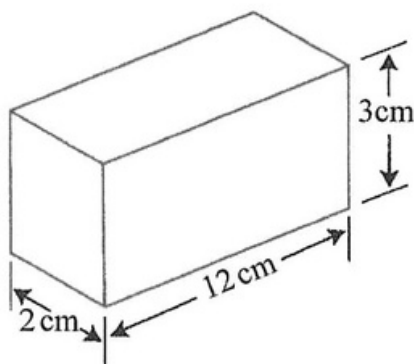
38. The diagram shows a developing foetus. Which of the following represents the placenta?



39. The reaction between sulphuric acid and sodium hydroxide is exothermic. Which observation is made during the reaction?

- A. The temperature of the solution rises.
- B. A precipitate forms.
- C. The temperature of the solution does not change.
- D. The temperature of the solution decreases.

40. The diagram shows a solid concrete block and its dimensions.



What is the volume of the concrete block?

- A. 15 cm^3
- B. 24 cm^3
- C. 48 cm^3
- D. 72 cm^3



41. 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

42. When hydrochloric acid is added to copper (II) carbonate, the gas evolved can be identified as it

- A. relights a glowing splint.
- B. bleaches litmus paper.
- C. turns moist litmus paper blue.
- D. turns lime water milky.

43. A plane mirror is fitted to a wall.

Which statement about the image formed by the mirror is correct?

- A. The image is real.
- B. The image is left to right reversed.
- C. The image is smaller than the object.
- D. The image is upside down.

44. The diagram below shows an eye in two different light conditions.

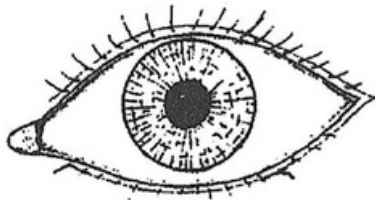


Diagram 1

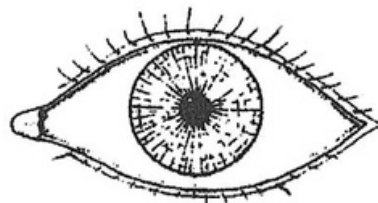


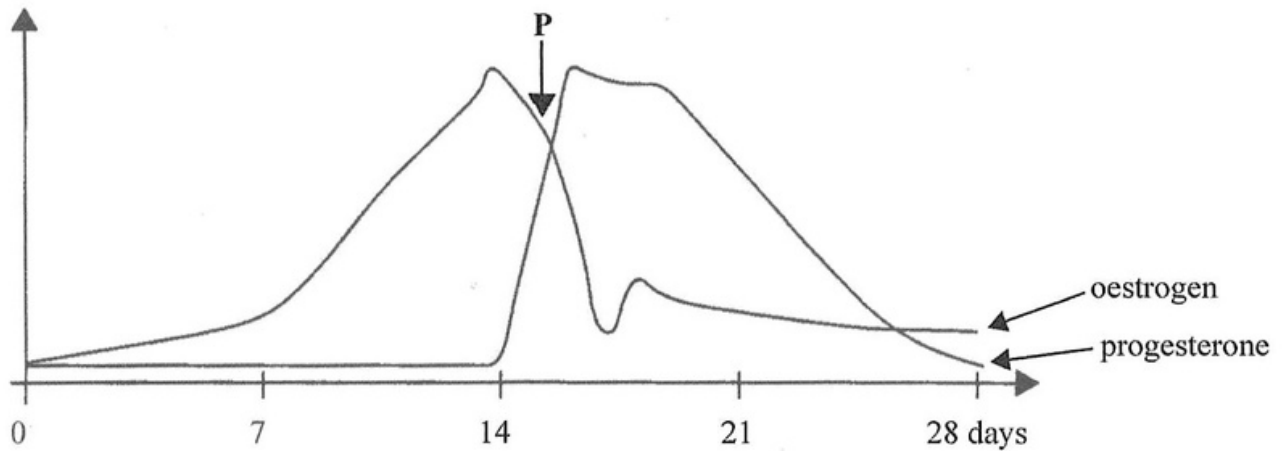
Diagram 2

What changes occur in the iris from diagram 1 to diagram 2?

- A. Radial muscles contract, circular muscles relax
- B. Radial muscles contract, circular muscles contract
- C. Radial muscles relax, circular muscles contract
- D. Radial muscles relax, circular muscles relax



45. The diagram shows the relative amounts of oestrogen and progesterone present during the menstrual cycle.



Which statement **BEST** describes what is happening at **P**?

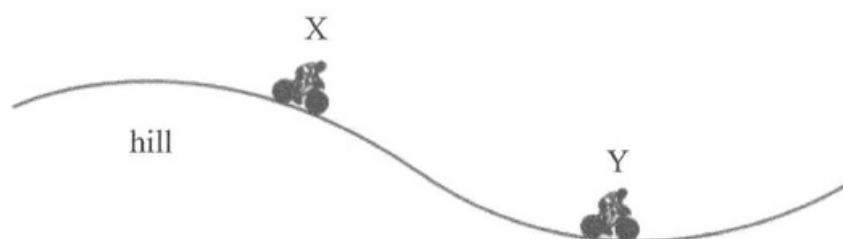
- A. Ovulation has occurred.
B. The corpus luteum has disappeared.
C. The graafian follicle is forming.
D. The ovum is maturing.
46. When zinc is added to hydrochloric acid, which of the following would cause the reaction to slow down?
- A. using a more concentrated acid
B. lowering the temperature
C. using a bigger conical flask
D. breaking the zinc into smaller pieces
47. At which rate does a lamp rated 60 W, 120 V transfer electrical energy?
- A. 0.5 J/s
B. 2.0 J/s
C. 60.0 J/s
D. 7200.0 J/s
48. Deficiency in which hormone results in diabetes mellitus?
- A. adrenalin
B. estrogen
C. glucagon
D. insulin



49. Which substance is a liquid at room temperature?

Substance	Melting point/°C	Boiling point/°C
A.	–101	–38
B.	–34	357
C.	98	883
D.	114	183

50. A cyclist travels down a hill from rest at point X without pedalling. The cyclist applies his brakes and the cycle stops at point Y.



Which energy changes have taken place between X and Y?

- A. gravitational potential → kinetic → thermal (heat)
- B. gravitational potential → thermal (heat) → kinetic
- C. kinetic → gravitational potential → thermal (heat)
- D. kinetic → thermal (heat) → gravitational potential

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