Topical Past Papers

IGCSE Chemistry (0620) Paper 2

[Extended | Multiple Choice Questions]

Exam Series: Feb/Mar 2017 – Oct/Nov 2024

Format Type A:
Answers to all questions are provided as an appendix

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Introduction

Each Topical Past Paper Questions Compilation contains a comprehensive collection of hundreds of questions and corresponding answer schemes, presented in worksheet format. The questions are carefully arranged according to their respective chapters and topics, which align with the latest IGCSE or AS/A Level subject content. Here are the key features of these resources:

1. The workbook covers a wide range of topics, which are organized according to the latest syllabus content for Cambridge IGCSE or AS/A Level exams.
2. Each topic includes numerous questions, allowing students to practice and reinforce their understanding of key concepts and skills.
3. The questions are accompanied by detailed answer schemes, which provide clear explanations and guidance for students to improve their performance.
4. The workbook's format is user-friendly, with worksheets that are easy to read and navigate.
5. This workbook is an ideal resource for students who want to familiarize themselves with the types of questions that may appear in their exams and to develop their problem-solving and analytical skills.

Overall, Topical Past Paper Questions Workbooks are a valuable tool for students preparing for IGCSE or AS/A level exams, providing them with the opportunity to practice and refine their knowledge and skills in a structured and comprehensive manner. To provide a clearer description of this book's specifications, here are some key details:

- Title: Cambridge IGCSE Chemistry (0620) Paper 2 Topical Past Papers
- Subtitle: Exam Practice Worksheets With Answer Scheme
- Examination board: Cambridge Assessment International Education (CAIE)
- Subject code: 0620
- Years covered: Feb/Mar 2017 – Oct/Nov 2024
- Paper: 2
- Number of pages: 814
- Number of questions: 1861

Contents

Chapter 1

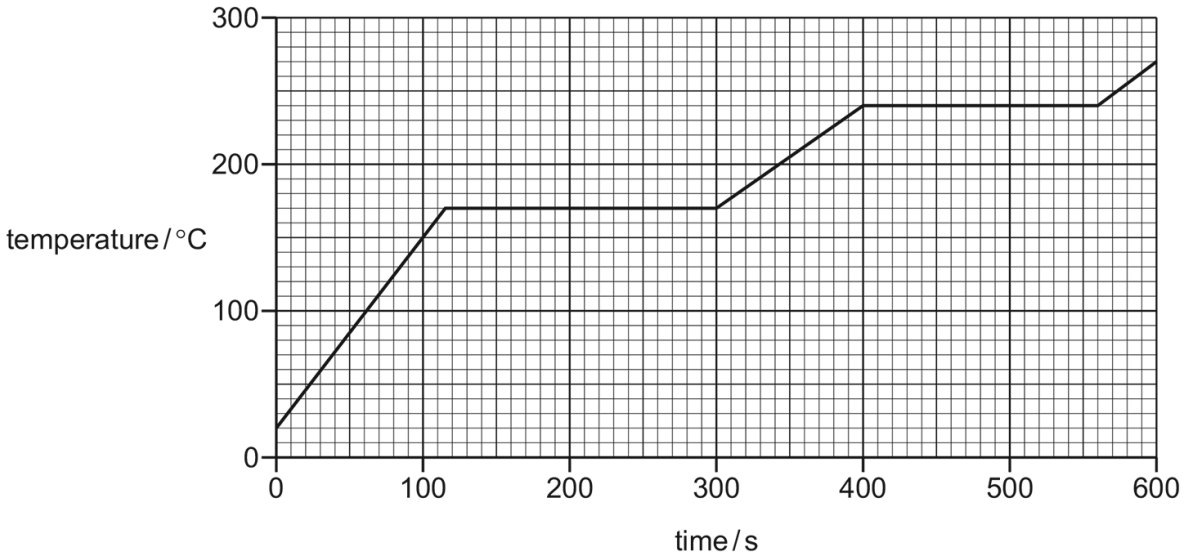
States of matter

1.1 Solids, liquids and gases

1. 0620_M24_qp_22 Q: 1

Solid X is heated for 600 seconds.

The graph shows the heating curve that is obtained.



What is the melting point of X?

A 20 °C **B** 170 °C **C** 240 °C **D** 270 °C

2. 0620_S24_qp_21 Q: 1

A gas is heated. The pressure is kept constant.

Which statement describes the behaviour of the particles in the gas?

A The particles move faster and become closer together.

B The particles move faster and become further apart.

C The particles move more slowly and become closer together.

D The particles move more slowly and become further apart.

3. 0620_S24_qp_21 Q: 2

A mixture of ice and water is left to stand and the ice melts.

Which row describes what happens as the ice is melting?

	temperature of mixture	energy change
A	increases	average kinetic energy of particles decreases
B	increases	energy is used to overcome attractive forces
C	stays the same	average kinetic energy of particles decreases
D	stays the same	energy is used to overcome attractive forces

4. 0620_S24_qp_23 Q: 1

Sodium chloride is a liquid at 900 °C.

Which row describes the arrangement and the motion of the particles in sodium chloride at 900 °C?

	arrangement of particles	motion of particles
A	regular	vibrate about a fixed point
B	regular	move randomly
C	random	vibrate about a fixed point
D	random	move randomly

5. 0620_W24_qp_21 Q: 1

Which row describes the arrangement and motion of the particles in a liquid?

	arrangement	motion
A	random and particles are touching	moving slowly
B	random with space between all particles	moving slowly
C	an ordered lattice with all particles touching	moving slowly
D	an ordered lattice with space between all particles	moving quickly

6. 0620_W24_qp_22 Q: 1

Oxygen melts at –219 °C and boils at –183 °C.

At which temperature is oxygen a liquid?

A –225 °C **B** –189 °C **C** –175 °C **D** 25 °C

7. 0620_W24_qp_22 Q: 2

The pressure of a sample of gas is decreased. The temperature is kept constant.

Which row describes the effects on the particles?

	movement of particles	collisions between particles
A	slower	occur less often
B	slower	occur with more force
C	no change in speed	occur less often
D	no change in speed	occur with more force

8. 0620_W24_qp_23 Q: 1

A sample of ethanol is left in an open beaker at room temperature.

After 24 hours, no ethanol remains in the beaker.

What has happened to the ethanol?

A It has boiled.

B It has condensed.

C It has evaporated.

D It has frozen.

9. 0620_W24_qp_23 Q: 2

A gas is in a sealed container with a fixed volume.

Which statements describe what happens to the molecules in the gas when the temperature is increased?

1 They move more slowly.

2 They collide with the walls of the container more frequently.

3 They collide with the walls of the container with less force.

4 They have greater kinetic energy.

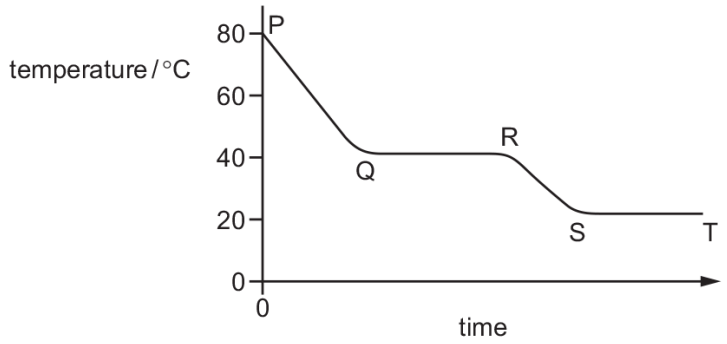
A 1 and 3 **B** 1 and 4 **C** 2 and 3 **D** 2 and 4

10. 0620_m23_qp_22 Q: 1

Substance M is a solid at 30 °C.

The substance is heated to 80 °C and its temperature measured as it cools down to room temperature.

The cooling curve is shown.



Between which times is substance M freezing?

A P to Q **B** Q to R **C** R to S **D** S to T

11. 0620_s23_qp_22 Q: 1

Four physical changes of ethanol are listed.

1 condensation

2 evaporation

3 freezing

4 boiling

In which changes do the particles move further apart?

A 1 and 2 **B** 1 and 3 **C** 2 and 4 **D** 3 and 4

12. 0620_s23_qp_23 Q: 1

Nitrogen is heated in a balloon, which expands slightly.

Which statements about the molecules of nitrogen are correct?

1 They move further apart.

2 They move more quickly.

3 They remain the same distance apart.

4 Their speed remains unchanged.

A 1 and 2 **B** 1 and 4 **C** 2 and 3 **D** 3 and 4

13. 0620_w23_qp_21 Q: 1

A gas is placed in a sealed container. The gas has a pressure of one atmosphere and a temperature of 50 °C.

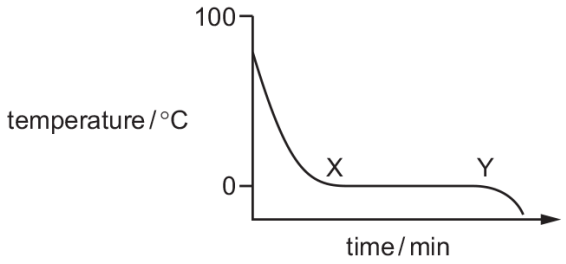
It is heated to 100 °C.

Which row describes the cause of the pressure of the gas and the effect of increasing the temperature of the gas?

	cause of gas pressure	the effect of increased temperature of the gas
A	collisions between gas particles	collisions become less frequent
B	collisions between gas particles	the average speed of the gas particles increases
C	collisions between gas particles and the container	collisions become less frequent
D	collisions between gas particles and the container	the average speed of the gas particles increases

14. 0620_w23_qp_22 Q: 1

Part of a cooling curve for water is shown.



What is occurring between points X and Y?

A Steam is condensing into water.

B The temperature of the water is decreasing.

C Ice is melting.

D Particles are losing heat to the surroundings.

15. 0620_w23_qp_23 Q: 1

A sample of a gas occupies 340 cm^3 at room temperature and pressure.

The temperature and pressure are both increased, but the volume occupied by the gas remains 340 cm^3.

Which row describes what happens to the particle speed and the average distance between the particles in the gas when the temperature and pressure are both increased?

	particle speed	average distance between particles
A	unchanged	unchanged
B	unchanged	increased
C	increased	unchanged
D	increased	increased

16. 0620_m22_qp_22 Q: 2

In which state does 1 dm^3 of methane contain the most particles?

A gas at 100 °C

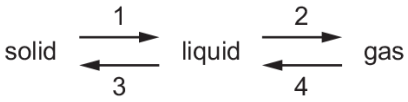
B gas at room temperature

C liquid

D solid

17. 0620_w22_qp_21 Q: 1

The diagram shows the changes of state between a solid, a liquid and a gas.



In which changes of state is energy being given out?

A 1 and 2 **B** 1 and 4 **C** 2 and 3 **D** 3 and 4

18. 0620_m21_qp_22 Q: 1

Which row about a change of state is correct?

	change of state	energy change	process
A	solid → liquid	heat given out	melting
B	gas → liquid	heat taken in	evaporation
C	solid → gas	heat taken in	sublimation
D	liquid → solid	heat given out	condensing

19. 0620_w21_qp_21 Q: 1

Decane has a freezing point of –30 °C and a boiling point of 174 °C.

A small sample of decane is placed in an open beaker in an oven at a temperature of 120 °C and at atmospheric pressure for 24 hours.

What happens to the sample of decane?

A It boils.

B It evaporates.

C It melts.

D It sublimes.

20. 0620_s20_qp_21 Q: 1

A mixture of ice and water is left to stand and the ice melts.

Which row describes what happens as the ice is melting?

	temperature of mixture	energy changes
A	increases	average kinetic energy of particles increases
B	increases	energy is used to overcome attractive forces
C	stays the same	average kinetic energy of particles increases
D	stays the same	energy is used to overcome attractive forces

21. 0620_s20_qp_22 Q: 1

A mixture of ice and water is left to stand and the ice melts.

Which row describes what happens as the ice is melting?

	temperature of mixture	energy changes
A	increases	average kinetic energy of particles increases
B	increases	energy is used to overcome attractive forces
C	stays the same	average kinetic energy of particles increases
D	stays the same	energy is used to overcome attractive forces

22. 0620_s20_qp_23 Q: 1

A mixture of ice and water is left to stand and the ice melts.

Which row describes what happens as the ice is melting?

	temperature of mixture	energy changes
A	increases	average kinetic energy of particles increases
B	increases	energy is used to overcome attractive forces
C	stays the same	average kinetic energy of particles increases
D	stays the same	energy is used to overcome attractive forces

23. 0620_m19_qp_22 Q: 1

Pure water boils at 100 °C.

What happens to the water particles when water boils?

A They gain energy and move further apart.

B They gain energy and stay close together.

C They lose energy and move further apart.

D They lose energy and stay close together.

24. 0620_s17_qp_23 Q: 2

A compound, X, has a melting point of 71 °C and a boiling point of 375 °C.

Which statement about X is correct?

A It is a liquid at 52 °C and a gas at 175 °C.

B It is a liquid at 69 °C and a gas at 380 °C.

C It is a liquid at 75 °C and a gas at 350 °C.

D It is a liquid at 80 °C and a gas at 400 °C.

25. 0620_w17_qp_21 Q: 1

Which process causes the greatest increase in the distance between particles?

A condensation

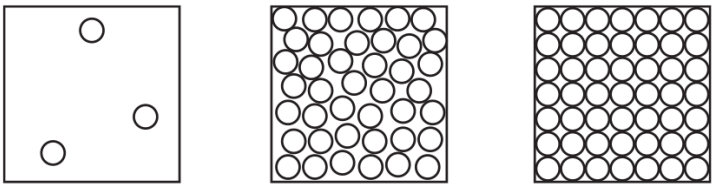
B freezing

C melting

D sublimation

26. 0620_w17_qp_22 Q: 1

The diagram shows the arrangement of particles in the three states of matter.



Solid carbon dioxide (dry ice) sublimes to gaseous carbon dioxide.

Which row describes the initial and final states?

	initial state	final state
A	P	R
B	Q	P
C	R	P
D	R	Q

27. 0620_w17_qp_23 Q: 1

Which statement describes sublimation?

A Particles moving slowly past each other speed up and move further apart.

B Particles vibrating next to each other become mobile and move slowly past each other.

C Particles vibrating next to each other start to move rapidly and move further apart.

D Rapidly moving particles slow down and move closer together.

1.2 Diffusion

28. 0620_M24_qp_22 Q: 2

Which statements about diffusion are correct?

1 Aqueous ions cannot diffuse in water.

2 Diffusion is caused by the random movement of particles.

3 Particles spread out in all directions in diffusion.

4 Diffusion can only take place in solids and liquids.

A 1 and 2 **B** 1 and 4 **C** 2 and 3 **D** 3 and 4

29. 0620_S24_qp_22 Q: 1

Which gas has the slowest rate of diffusion?

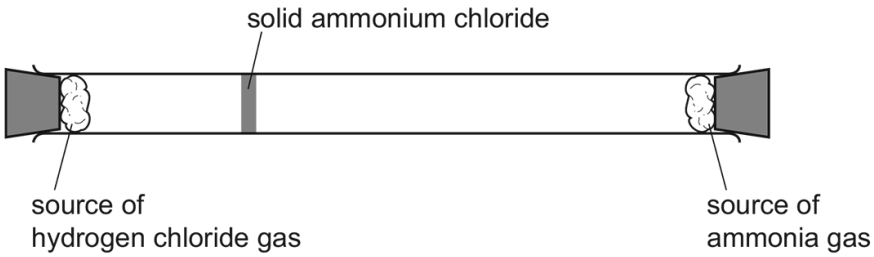
A H_2 **B** NH_3 **C** CH_4 **D** CO_2

30. 0620_S24_qp_23 Q: 2

Hydrogen chloride gas, HCl, reacts with ammonia gas, NH_3, to form solid ammonium chloride.

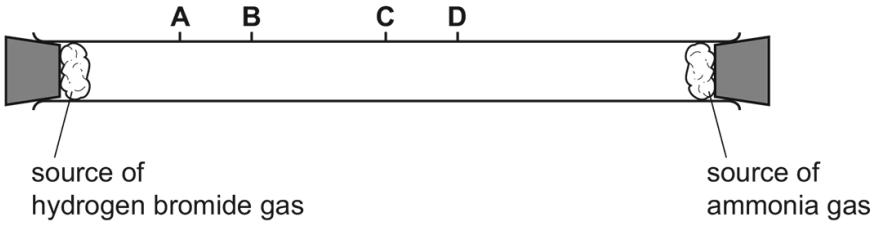
The apparatus is set up as shown.

After a few minutes, a white cloud of solid ammonium chloride forms where the two gases meet.



The experiment is repeated using hydrogen bromide gas, HBr, in place of hydrogen chloride.

How far along the tube does the white cloud of solid ammonium bromide form?



31. 0620_W24_qp_21 Q: 2

Which gas has the lowest rate of diffusion at room temperature and pressure?

A the gas produced when ammonium chloride is heated with aqueous sodium hydroxide

B the gas which makes up approximately 78% of clean, dry air

C the gas produced when sodium carbonate is added to dilute hydrochloric acid

D the gas produced when zinc is added to dilute sulfuric acid

32. 0620_m23_qp_22 Q: 2

Which gas has the fastest rate of diffusion?

A Ar **B** C_2H_6 **C** HCl **D** H_2S

33. 0620_s23_qp_21 Q: 1

The diagram shows the result of dropping a purple crystal into water.

Which processes take place in this experiment?

	chemical reaction	diffusing	dissolving
A	✓	✓	✗
B	✓	✗	✗
C	✗	✗	✓
D	✗	✓	✓

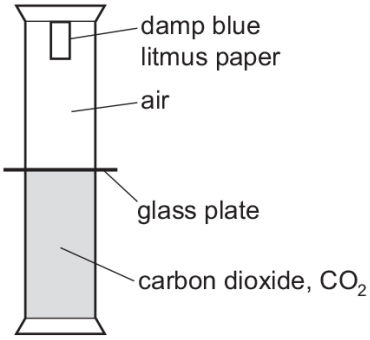
34. 0620_w23_qp_21 Q: 2

Four experiments, each containing a different acidic gas, are set up as shown.

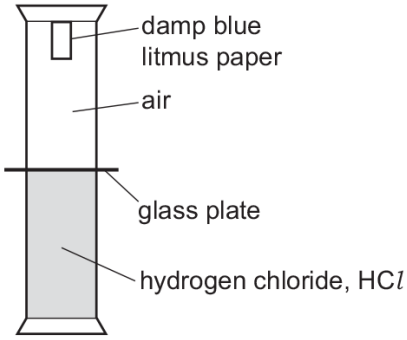
The dividing glass plates are removed at the same time.

In which set of apparatus does the litmus turn red first?

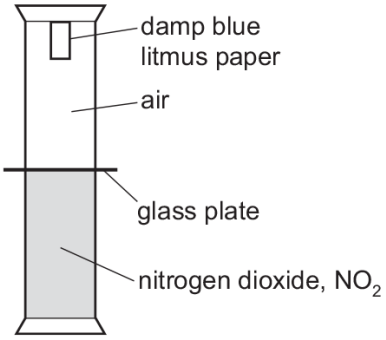
A



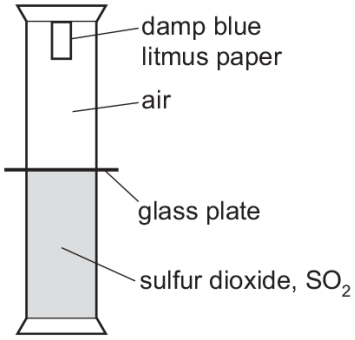
B



C



D



35. 0620_w23_qp_23 Q: 2

Which statements about the rate of diffusion of the gases ammonia, carbon monoxide, nitrogen and oxygen are correct?

1 Nitrogen and carbon monoxide will diffuse at the same rate.

2 Oxygen will diffuse slowest because it is an element, whereas the others are compounds.

3 Ammonia will diffuse fastest.

A 1 and 2 **B** 1 and 3 **C** 1 only **D** 2 and 3

36. 0620_m22_qp_22 Q: 1

Which gas has the fastest rate of diffusion?

A H_2 **B** CH_4 **C** CO_2 **D** SO_2

37. 0620_s22_qp_21 Q: 1

Which two gases will diffuse at the same rate, at the same temperature?

A carbon monoxide and carbon dioxide

B carbon monoxide and nitrogen

C chlorine and fluorine

D nitrogen and oxygen

38. 0620_s22_qp_22 Q: 1

Which two gases will diffuse at the same rate, at the same temperature?

A carbon monoxide and carbon dioxide

B carbon monoxide and nitrogen

C chlorine and fluorine

D nitrogen and oxygen

39. 0620_s22_qp_23 Q: 1

Which two gases will diffuse at the same rate, at the same temperature?

A carbon monoxide and carbon dioxide

B carbon monoxide and nitrogen

C chlorine and fluorine

D nitrogen and oxygen

40. 0620_w22_qp_22 Q: 1

The rate of diffusion of three gases, ammonia, carbon dioxide and methane, is measured.

What is the order of the rate of diffusion of the gases from slowest to fastest?

A $CO_2 \rightarrow NH_3 \rightarrow CH_4$

B $CO_2 \rightarrow CH_4 \rightarrow NH_3$

C $CH_4 \rightarrow NH_3 \rightarrow CO_2$

D $NH_3 \rightarrow CH_4 \rightarrow CO_2$

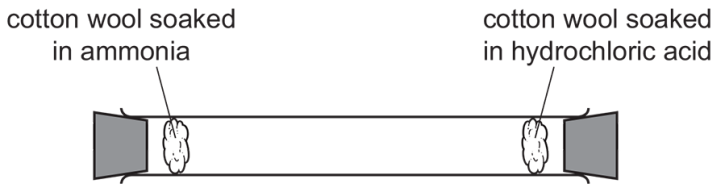
41. 0620_w22_qp_23 Q: 1

Which gas diffuses the most slowly?

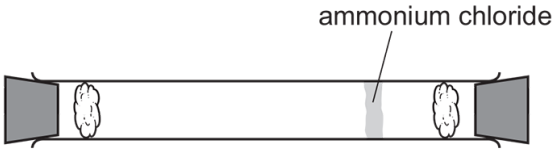
A CH_4 **B** CO_2 **C** H_2 **D** NH_3

42. 0620_w21_qp_22 Q: 1

An experiment is set up as shown.



After several minutes, a white ring of ammonium chloride appears as shown.



Which statement explains the observation after several minutes?

A Ammonia gas diffuses faster than hydrogen chloride gas because its molecules have a lower molecular mass.

B Ammonia gas diffuses faster than hydrogen chloride gas because its molecules have a higher molecular mass.

C Ammonia gas diffuses slower than hydrogen chloride gas because its molecules have a lower molecular mass.

D Ammonia gas diffuses slower than hydrogen chloride gas because its molecules have a higher molecular mass.

43. 0620_w21_qp_23 Q: 1

Brownian motion and the diffusion of gases provide evidence for the particulate nature of matter.

Which row identifies an example of Brownian motion and how molecular mass determines the rate of diffusion of gas molecules?

	Brownian motion	diffusion
A	pollen grains in water are seen to move randomly	heavier gas molecules diffuse more quickly
B	pollen grains in water are seen to move randomly	lighter gas molecules diffuse more quickly
C	salt dissolves faster in hot water than in cold water	heavier gas molecules diffuse more quickly
D	salt dissolves faster in hot water than in cold water	lighter gas molecules diffuse more quickly

44. 0620_m20_qp_22 Q: 1

The formula of methane is CH_4 and the formula of ethane is C_2H_6.

Which row describes diffusion and the relative rates of diffusion of methane and ethane?

	description of diffusion	relative rate of diffusion
A	particles move from a high concentration to a low concentration	ethane diffuses more quickly than methane
B	particles move from a high concentration to a low concentration	methane diffuses more quickly than ethane
C	particles move from a low concentration to a high concentration	ethane diffuses more quickly than methane
D	particles move from a low concentration to a high concentration	methane diffuses more quickly than ethane

45. 0620_w20_qp_21 Q: 1

Which gas has the slowest rate of diffusion?

A H_2 **B** NH_3 **C** CH_4 **D** CO_2

46. 0620_w20_qp_22 Q: 1

Which gas has the slowest rate of diffusion?

A H_2 **B** NH_3 **C** CH_4 **D** CO_2

47. 0620_w20_qp_23 Q: 1

Which gas has the slowest rate of diffusion?

A H_2 **B** NH_3 **C** CH_4 **D** CO_2

48. 0620_s19_qp_21 Q: 1

Which statement explains why ammonia gas, NH_3, diffuses at a faster rate than hydrogen chloride gas, HCl?

A Ammonia expands to occupy all of the space available.

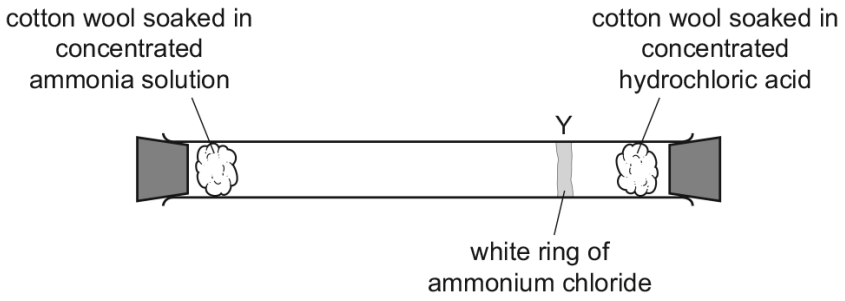
B Ammonia has a smaller relative molecular mass than hydrogen chloride.

C Ammonia is an alkali and hydrogen chloride is an acid.

D Ammonia molecules diffuse in all directions at the same time.

49. 0620_s19_qp_22 Q: 1

The apparatus shown is set up. After 20 minutes a white ring of ammonium chloride is seen at position Y.



Which statement about the molecules of ammonia and hydrogen chloride is correct?

A Molecules in ammonia have a larger M_r than molecules of hydrogen chloride and so they move more slowly.

B Molecules in ammonia have a larger M_r than molecules of hydrogen chloride and so they move more quickly.

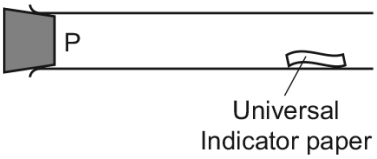
C Molecules in ammonia have a smaller M_r than molecules of hydrogen chloride and so they move more slowly.

D Molecules in ammonia have a smaller M_r than molecules of hydrogen chloride and so they move more quickly.

50. 0620_s19_qp_23 Q: 1

Hydrogen chloride gas (M_r = 36.5) is released at P in the apparatus shown.

The Universal Indicator paper turns red after 38 s.



The experiment is repeated using sulfur dioxide (M_r = 64).

What is the result for sulfur dioxide?

	Universal Indicator turns	time for Universal Indicator to change colour / s
A	blue	26
B	blue	51
C	red	26
D	red	51

51. 0620_w19_qp_21 Q: 1

Samples of four gases are released in a room at the same time.

The gases are carbon dioxide, CO_2, hydrogen chloride, HCl, hydrogen sulfide, H_2S, and nitrogen dioxide, NO_2.

Which gas diffuses fastest?

A carbon dioxide

B hydrogen chloride

C hydrogen sulfide

D nitrogen dioxide

52. 0620_w19_qp_22 Q: 1

The rate of diffusion of a gas depends on its molecular mass and the temperature.

Which combination of molecular mass and temperature gives the slowest rate of diffusion?

	molecular mass	temperature
A	high	high
B	high	low
C	low	high
D	low	low

53. 0620_w19_qp_23 Q: 1

Which two gases will diffuse at the same rate, at the same temperature?

A carbon monoxide and carbon dioxide

B carbon monoxide and nitrogen

C chlorine and fluorine

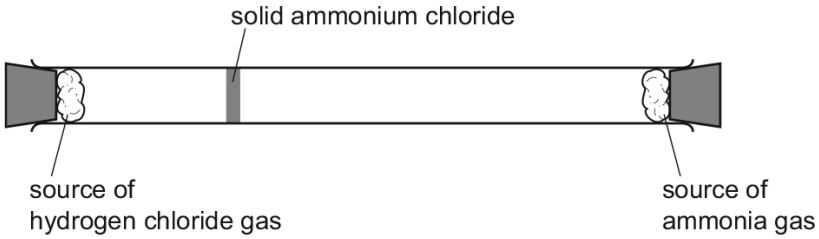
D nitrogen and oxygen

54. 0620_m18_qp_22 Q: 1

Hydrogen chloride gas, HC*l*, reacts with ammonia gas, NH_3, to form solid ammonium chloride.

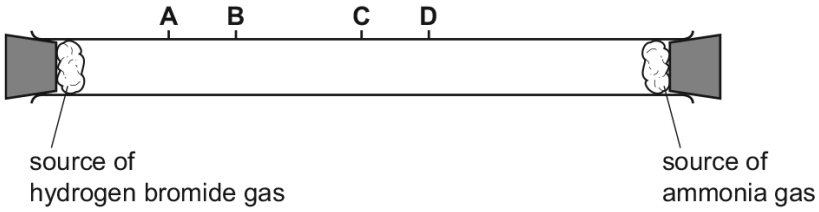
The apparatus is set up as shown.

After a few minutes, solid ammonium chloride forms where the two gases meet.



The experiment is repeated using hydrogen bromide, HBr, in place of hydrogen chloride.

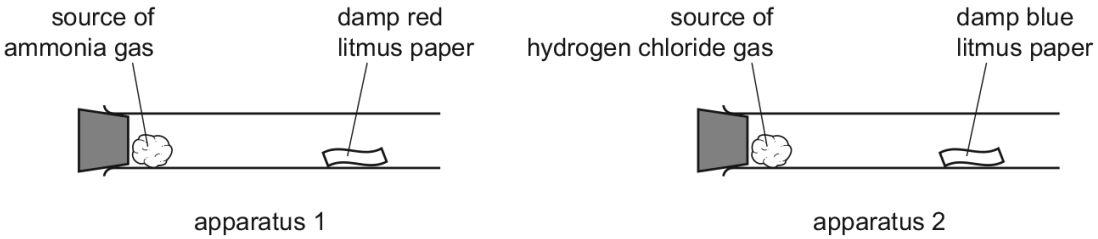
How far along the tube does the solid ammonium bromide form?



55. 0620_s18_qp_21 Q: 1

A student investigated the diffusion of ammonia gas, NH_3, and hydrogen chloride gas, HCl.

Two sets of apparatus were set up as shown at room temperature and pressure.



apparatus 1 apparatus 2

The damp red litmus paper in apparatus 1 changed colour after 30 seconds.

How long does it take for the damp blue litmus paper to change colour in apparatus 2?

A 64 seconds

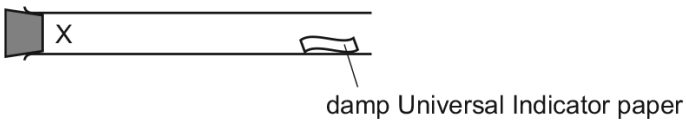
B 30 seconds

C 21 seconds

D The blue litmus paper would not change colour.

56. 0620_s18_qp_22 Q: 1

A gas is released at point X in the apparatus shown.



Which gas turns the damp Universal Indicator paper red most quickly?

A ammonia, NH_3

B chlorine, Cl_2

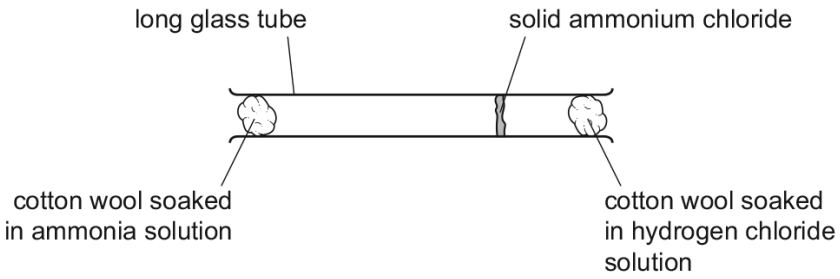
C hydrogen chloride, HCl

D sulfur dioxide, SO_2

57. 0620_s18_qp_23 Q: 1

Ammonia gas is reacted with hydrogen chloride gas using the apparatus shown.

Solid ammonium chloride is produced.



Which statement explains why the solid ammonium chloride is formed nearer to the hydrogen chloride?

A Ammonia solution is a base and hydrogen chloride solution is an acid.

B Ammonia molecules diffuse more slowly than hydrogen chloride molecules.

C Hydrogen chloride has a greater molecular mass than ammonia.

D Hydrogen chloride moves by Brownian motion.

58. 0620_w18_qp_22 Q: 1

Oxygen and fluorine are gaseous elements next to each other in the Periodic Table.

Under the same conditions of temperature and pressure, oxygen diffuses .....1..... than fluorine because its .....2..... is less than that of fluorine.

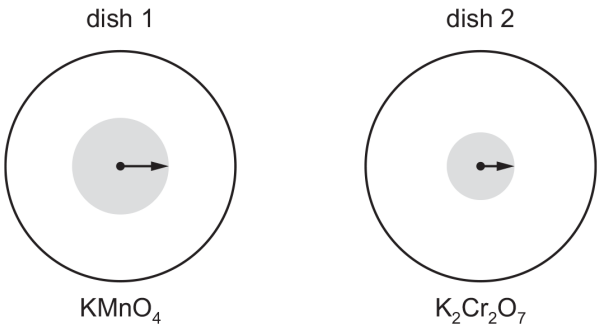
Which words correctly complete gaps 1 and 2?

	1	2
A	faster	molecular mass
B	faster	reactivity
C	slower	molecular mass
D	slower	reactivity

59. 0620_s17_qp_21 Q: 1

Small crystals of purple $KMnO_4$ (M_r = 158) and orange $K_2Cr_2O_7$ (M_r = 294) were placed at the centres of separate petri dishes filled with agar jelly. They were left to stand under the same physical conditions.

After some time, the colour of each substance had spread out as shown.



The lengths of the arrows indicate the relative distances travelled by particles of each substance.

Which statement is correct?

A Diffusion is faster in dish 1 because the mass of the particles is greater.

B Diffusion is faster in dish 2 because the mass of the particles is greater.

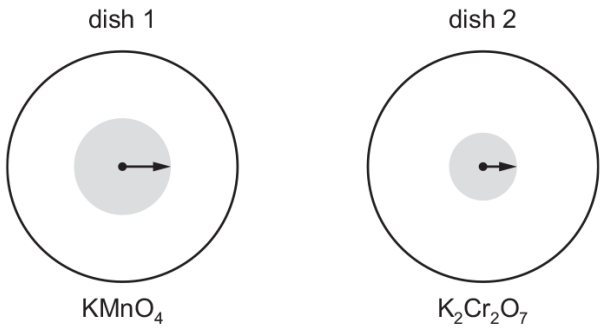
C Diffusion is slower in dish 1 because the mass of the particles is smaller.

D Diffusion is slower in dish 2 because the mass of the particles is greater.

60. 0620_s17_qp_23 Q: 1

Small crystals of purple $KMnO_4$ (M_r = 158) and orange $K_2Cr_2O_7$ (M_r = 294) were placed at the centres of separate petri dishes filled with agar jelly. They were left to stand under the same physical conditions.

After some time, the colour of each substance had spread out as shown.



The lengths of the arrows indicate the relative distances travelled by particles of each substance.

Which statement is correct?

A Diffusion is faster in dish 1 because the mass of the particles is greater.

B Diffusion is faster in dish 2 because the mass of the particles is greater.

C Diffusion is slower in dish 1 because the mass of the particles is smaller.

D Diffusion is slower in dish 2 because the mass of the particles is greater.

Chapter 2

Atoms, elements and compounds

2.1 Elements, compounds and mixtures

61. 0620_S24_qp_23 Q: 3

Substances P and Q both conduct electricity.

P is a mixture of two different types of atom.

Q is made of only one type of atom.

Which row describes P and Q?

	P	Q
A	alloy	element
B	alloy	compound
C	compound	alloy
D	compound	element

62. 0620_S24_qp_23 Q: 4

An atom of element R contains 15 protons, 16 neutrons and 15 electrons.

What is R?

A gallium

B phosphorus

C sulfur

D zinc

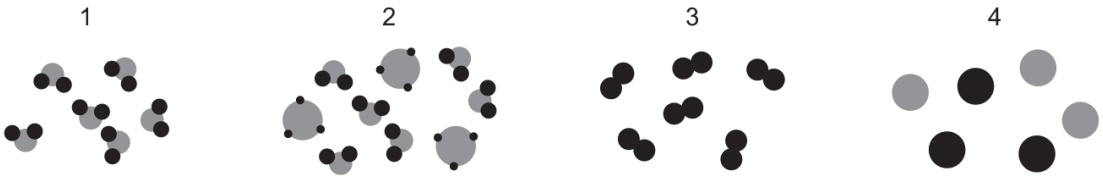
63. 0620_s23_qp_21 Q: 2

Which row about elements, mixtures and compounds is correct?

	metallic element	non-metallic element	mixture	compound
A	copper	methane	brass	sulfur
B	brass	sulfur	copper	methane
C	copper	sulfur	brass	methane
D	brass	methane	copper	sulfur

64. 0620_s23_qp_23 Q: 2

The diagrams represent some elements, compounds and mixtures.



Which row describes the numbered substances?

	1	2	3	4
A	element	mixture of compounds	compound	mixture of elements
B	compound	mixture of compounds	element	mixture of elements
C	element	mixture of elements	compound	mixture of compounds
D	compound	mixture of elements	element	mixture of compounds

65. 0620_w23_qp_22 Q: 2

Which statements about clean, dry air are correct?

1 It is a mixture of elements only.

2 It is a mixture of elements and compounds.

3 It contains only non-metals.

A 1 and 3 **B** 1 only **C** 2 and 3 **D** 2 only

66. 0620_w23_qp_23 Q: 8

Which substance is a mixture?

A air

B graphite

C oxygen

D water

2.2 Atomic structure and the Periodic Table

67. 0620_M24_qp_22 Q: 3

Which statement about an atom of fluorine, $^{19}_{9}F$, is correct?

A It contains a total of 28 protons, neutrons and electrons.

B It contains more protons than neutrons.

C Its isotopes contain different numbers of protons.

D Its nucleus contains 9 neutrons.

68. 0620_S24_qp_21 Q: 4

Four statements about atoms are listed.

1 The centre of an atom is positively charged.

2 Protons and electrons are located in the nucleus.

3 Protons and electrons have the same mass.

4 Most of the mass of an atom is in the nucleus.

Which statements are correct?

A 1 and 2 **B** 1 and 4 **C** 2 and 3 **D** 3 and 4

69. 0620_S24_qp_21 Q: 5

The electronic configurations of two elements are given.

element L: 2,8,8,1

element M: 2,8,4

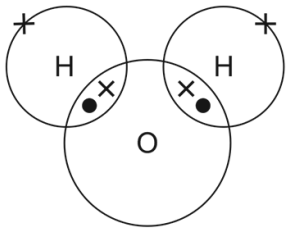
Which row identifies the group number and the period number for element L and element M?

	element L		element M	
	group number	period number	group number	period number
A	I	4	IV	3
B	I	4	III	4
C	IV	1	III	4
D	IV	1	IV	3

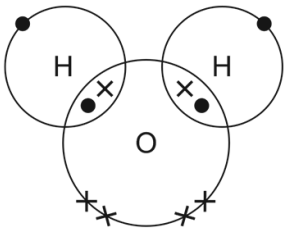
70. 0620_S24_qp_22 Q: 4

Which diagram shows the arrangement of the outer shell electrons in a molecule of water?

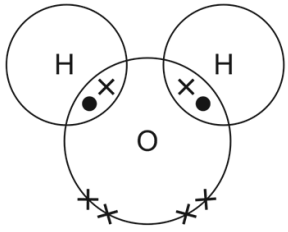
A



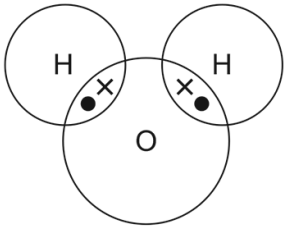
B



C



D



71. 0620_S24_qp_22 Q: 23

Which statements describe the elements in Group VIII of the Periodic Table?

1 Their atoms have full outer electron shells.

2 They are unreactive metals.

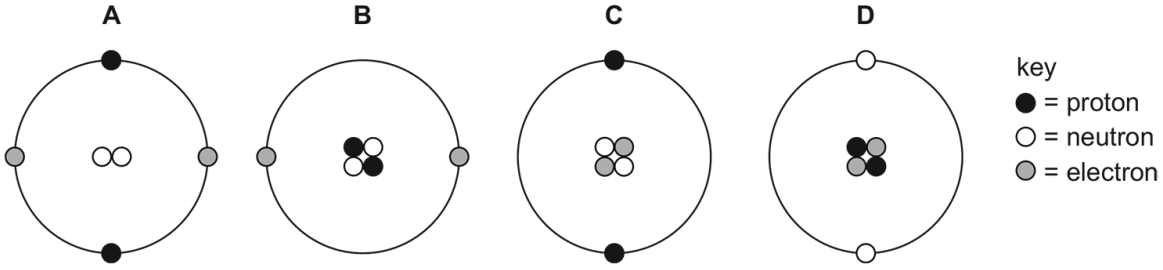
3 They are monatomic gases.

4 They are diatomic gases.

A 1 and 3 **B** 1 and 4 **C** 2 and 3 **D** 2 and 4

72. 0620_W24_qp_21 Q: 3

Which diagram represents one helium atom?



73. 0620_s23_qp_21 Q: 5

Nitrogen forms a nitride ion with the formula N^{3-}.

Which particle does **not** have the same electronic configuration as the nitride ion?

A Al^{3+} **B** Cl^{-} **C** Na^{+} **D** O^{2-}

74. 0620_s23_qp_22 Q: 2

An atom of element X contains:

- 5 protons
- 6 neutrons
- 5 electrons.

Which statements about element X are correct?

1 X has an atomic number of 6.

2 X has a nucleon number of 11.

3 X is in Group II of the Periodic Table.

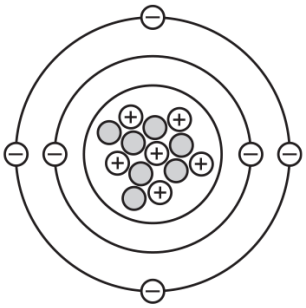
4 X is in the second period of the Periodic Table.

A 1 and 3 **B** 1 and 4 **C** 2 and 3 **D** 2 and 4

compiled by examinent.com

75. 0620_w23_qp_22 Q: 3

A representation of an atom is shown.



What is the nucleon number of this atom?

A 6 **B** 7 **C** 12 **D** 13

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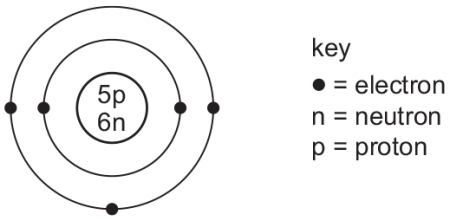
76. 0620_w23_qp_23 Q: 3

The structure of an atom of element X is shown.



What is element X?

A boron

B carbon

C sodium

D sulfur

77. 0620_s22_qp_21 Q: 6

Which diagram represents the outer-shell electron arrangement in a nitrogen molecule?

A

B

C

D

78. 0620_s21_qp_21 Q: 4

Element X has 7 protons.

Element Y has 8 more protons than X.

Which statement about element Y is correct?

A Y has more electron shells than X.

B Y has more electrons in its outer shell than X.

C Y is in a different group of the Periodic Table from X.

D Y is in the same period of the Periodic Table as X.

79. 0620_s21_qp_22 Q: 4

Element X has 7 protons.

Element Y has 8 more protons than X.

Which statement about element Y is correct?

A Y has more electron shells than X.

B Y has more electrons in its outer shell than X.

C Y is in a different group of the Periodic Table from X.

D Y is in the same period of the Periodic Table as X.

80. 0620_s21_qp_23 Q: 4

Element X has 7 protons.

Element Y has 8 more protons than X.

Which statement about element Y is correct?

A Y has more electron shells than X.

B Y has more electrons in its outer shell than X.

C Y is in a different group of the Periodic Table from X.

D Y is in the same period of the Periodic Table as X.

81. 0620_w21_qp_23 Q: 4

The nucleus of a particular atom consists of nineteen particles.

Nine of them are positively charged and ten of them are uncharged.

Which statement about this nucleus is correct?

A The nucleus has a nucleon number of nine.

B The nucleus has a nucleon number of ten.

C The nucleus has a proton number of nine.

D The nucleus has a proton number of ten.

82. 0620_s20_qp_21 Q: 4

The atomic number and nucleon number of a potassium atom are shown.

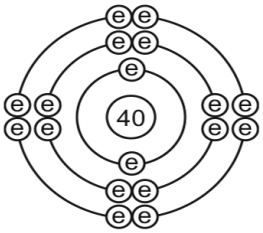
	potassium atom
atomic number	19
nucleon number	39

How many protons, neutrons and electrons are in a potassium ion, K^+?

	protons	neutrons	electrons
A	19	20	18
B	19	20	20
C	20	19	18
D	20	19	19

83. 0620_s20_qp_22 Q: 4

The diagram shows the electronic structure of a particle with a nucleon number (mass number) of 40.



The table shows the suggestions that three students, 1, 2 and 3, made to identify the particle.

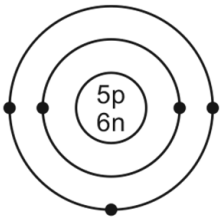
	student		
	1	2	3
particle	Ar	Cl	Ca^{2+}

Which students are correct?

A 1 and 2 only **B** 1 and 3 only **C** 2 and 3 only **D** 1, 2 and 3

84. 0620_s20_qp_23 Q: 4

The structure of an atom of element X is shown.



key
● = electron
n = neutron
p = proton

What is element X?

A boron

B carbon

C sodium

D sulfur

85. 0620_w20_qp_21 Q: 5

The atomic structure of four particles are shown.

	electrons	protons	neutrons
P	18	17	18
Q	18	17	20
R	17	17	18
S	17	17	20

Which particles have the same chemical properties?

A P and R only **B** P and S **C** P, Q and R **D** R and S

86. 0620_m19_qp_22 Q: 6

Which row describes the structure of the positive ion in sodium chloride?

	protons	electrons	neutrons
A	11	11	12
B	11	10	12
C	17	17	18
D	17	18	18

87. 0620_s19_qp_21 Q: 4

Which statement about an atom of fluorine, $^{19}_{9}F$, is correct?

A It contains more protons than neutrons.

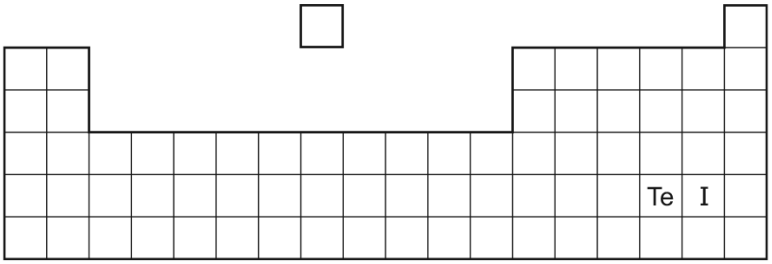
B It contains a total of 28 protons, neutrons and electrons.

C Its isotopes contain different numbers of protons.

D Its nucleus contains 9 neutrons.

88. 0620_w18_qp_21 Q: 3

Iodine, I, has a lower relative atomic mass than tellurium, Te, but is placed after it in the Periodic Table.



Which statement explains why iodine is placed after tellurium in the Periodic Table?

A Iodine has fewer neutrons than tellurium.

B Iodine has fewer protons than tellurium.

C Iodine has more neutrons than tellurium.

D Iodine has more protons than tellurium.

89. 0620_w18_qp_22 Q: 3

How many neutrons are present in the atom $^{45}_{21}X$?

A 21 **B** 24 **C** 45 **D** 66

90. 0620_s17_qp_22 Q: 4

Which element does **not** form a stable ion with the same electronic structure as argon?

A aluminium

B chlorine

C phosphorus

D potassium

2.3 Isotopes

91. 0620_M24_qp_22 Q: 4

Two of the isotopes of calcium are represented as $^{40}_{20}Ca$ and $^{44}_{20}Ca$.

Which statement explains why these isotopes of calcium have identical chemical properties?

A Both isotopes have the same number of neutrons.

B Both isotopes have an electronic configuration of 2,8,8,2.

C Both isotopes have a mass number of 20.

D Both isotopes have four fully occupied electron shells.

92. 0620_S24_qp_21 Q: 6

Which statement explains why isotopes of the same element have the same chemical properties?

A They have different numbers of protons in their nucleus.

B They have different numbers of neutrons in their nucleus.

C They have the same electronic configuration.

D They have the same number of electrons as protons.

93. 0620_S24_qp_22 Q: 3

Which statements about isotopes are correct?

1 Isotopes are atoms of different elements with the same number of protons.

2 Isotopes of the same element have the same chemical properties.

3 Isotopes are atoms with the same relative atomic mass.

4 Isotopes of the same element have the same electronic configuration.

A 1 and 2 **B** 1 and 3 **C** 2 and 4 **D** 3 and 4

Appendix A

Answers

SN	Paper	Q. No.	Answer
1	0620_M24_qp_22	1	B
2	0620_S24_qp_21	1	B
3	0620_S24_qp_21	2	D
4	0620_S24_qp_23	1	D
5	0620_W24_qp_21	1	A
6	0620_W24_qp_22	1	B
7	0620_W24_qp_22	2	C
8	0620_W24_qp_23	1	C
9	0620_W24_qp_23	2	D
10	0620_m23_qp_22	1	B
11	0620_s23_qp_22	1	C
12	0620_s23_qp_23	1	A
13	0620_w23_qp_21	1	D
14	0620_w23_qp_22	1	D
15	0620_w23_qp_23	1	C
16	0620_m22_qp_22	2	D
17	0620_w22_qp_21	1	D
18	0620_m21_qp_22	1	C
19	0620_w21_qp_21	1	B
20	0620_s20_qp_21	1	D
21	0620_s20_qp_22	1	D
22	0620_s20_qp_23	1	D
23	0620_m19_qp_22	1	A
24	0620_s17_qp_23	2	D
25	0620_w17_qp_21	1	D
26	0620_w17_qp_22	1	C
27	0620_w17_qp_23	1	C
28	0620_M24_qp_22	2	C
29	0620_S24_qp_22	1	D
30	0620_S24_qp_23	2	A
31	0620_W24_qp_21	2	C
32	0620_m23_qp_22	2	B
33	0620_s23_qp_21	1	D
34	0620_w23_qp_21	2	B
35	0620_w23_qp_23	2	B
36	0620_m22_qp_22	1	A
37	0620_s22_qp_21	1	B
38	0620_s22_qp_22	1	B
39	0620_s22_qp_23	1	B
40	0620_w22_qp_22	1	A
41	0620_w22_qp_23	1	B
42	0620_w21_qp_22	1	A
43	0620_w21_qp_23	1	B
44	0620_m20_qp_22	1	B
45	0620_w20_qp_21	1	D
46	0620_w20_qp_22	1	D
47	0620_w20_qp_23	1	D
48	0620_s19_qp_21	1	B
49	0620_s19_qp_22	1	D

SN	Paper	Q. No.	Answer
50	0620_s19_qp_23	1	D
51	0620_w19_qp_21	1	C
52	0620_w19_qp_22	1	B
53	0620_w19_qp_23	1	B
54	0620_m18_qp_22	1	A
55	0620_s18_qp_21	1	A
56	0620_s18_qp_22	1	C
57	0620_s18_qp_23	1	C
58	0620_w18_qp_22	1	A
59	0620_s17_qp_21	1	D
60	0620_s17_qp_23	1	D
61	0620_S24_qp_23	3	A
62	0620_S24_qp_23	4	B
63	0620_s23_qp_21	2	C
64	0620_s23_qp_23	2	B
65	0620_w23_qp_22	2	C
66	0620_w23_qp_23	8	A
67	0620_M24_qp_22	3	A
68	0620_S24_qp_21	4	B
69	0620_S24_qp_21	5	A
70	0620_S24_qp_22	4	C
71	0620_S24_qp_22	23	A
72	0620_W24_qp_21	3	B
73	0620_s23_qp_21	5	B
74	0620_s23_qp_22	2	D
75	0620_w23_qp_22	3	D
76	0620_w23_qp_23	3	A
77	0620_s22_qp_21	6	D
78	0620_s21_qp_21	4	A
79	0620_s21_qp_22	4	A
80	0620_s21_qp_23	4	A
81	0620_w21_qp_23	4	C
82	0620_s20_qp_21	4	A
83	0620_s20_qp_22	4	B
84	0620_s20_qp_23	4	A
85	0620_w20_qp_21	5	D
86	0620_m19_qp_22	6	B
87	0620_s19_qp_21	4	B
88	0620_w18_qp_21	3	D
89	0620_w18_qp_22	3	B
90	0620_s17_qp_22	4	A
91	0620_M24_qp_22	4	B
92	0620_S24_qp_21	6	C
93	0620_S24_qp_22	3	C
94	0620_W24_qp_22	3	B
95	0620_W24_qp_23	6	C
96	0620_m23_qp_22	3	D
97	0620_s23_qp_21	3	B
98	0620_s23_qp_21	4	A