

Chemistry Paper 1

[4541/1]

Each question is followed by either three, four or five options. Choose the best option for each question and then blacken the correct space on the answer sheet.

1. Which substances is made up of molecules?

- A zinc
- B ethanol
- C sodium chloride
- D magnesium oxide

2. Which of the following shows the correct type of particle for each substance?

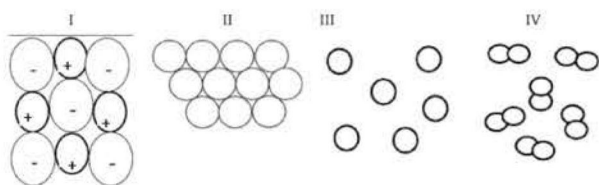
Molecule

- A Carbon dioxide
- B Sulphuric acid
- C Sodium chloride
- D Silicon

Ion

- A Sodium chloride
- B Silicon
- C Carbon dioxide
- D Sulphuric acid

3. Diagram below shows the arrangement of particles found in four substances



Which of the arrangement of particles that give the name of particles correctly?

	I	II	III	IV
A	Copper	helium	oxygen	Sodium chloride
B	oxygen	Sodium chloride	Copper	helium
C	Sodium chloride	Copper	helium	oxygen
D	helium	oxygen	Sodium chloride	Copper

4. Which of the following processes is about kinetic theory of matter?

- A Diffusion
- B Respiration
- C Neutralization
- D Photosynthesis

5. Table below shows the melting point and boiling point of substances J, K, L and M.

Substance	Melting point (°C)	Boiling point (°C)
J	-187	-126
K	-78	70
L	75	130
M	114	444

Which substance is a liquid at room temperature?

- A J
- B K
- C L
- D M

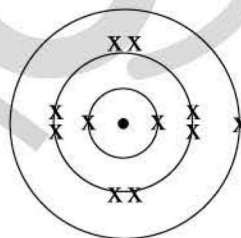
6. Diagram below shows the cooling curve of liquid Q.



Which statement can be deduced from Diagram above?

- A From t_2 to t_3 , the particles are less closely packed
- B From t_1 to t_2 , Q does not release heat energy
- C The freezing point of Q is 70°C
- D At t_1 , Q exist as solid

7. Diagram below shows the electron arrangement for atom Y



What is the nucleon number of atom Y?

- A 11
- B 12
- C 23
- D 34

8. The equation below shows the heating action on calcium carbonate.



How much mass of calcium carbonate is needed to produced 360 cm^3 of carbon dioxide at room condition?

[Relative atomic mass : C=12; O=16; Ca= 40; molar volume = $24 \text{ dm}^3 \text{ mol}^{-1}$ at room condition]

- A 0.8 g
- B 1.5 g
- C 6.6 g
- D 8.6 g

9. In an experiment, 24 g of element X react with 32 g sulphur to form a compound. What is the empirical formula of that compound?

[Relative atomic mass; X=6, S=32]

- A XS
- B X_2S
- C X_2S_3
- D X_4S

18. Which statement explains why ionic compound has high melting point?

- A Covalent bond between atoms is strong
- B Electrostatic force between ions is strong
- C There are free moving ions in the compound
- D More energy is needed to overcome the force between molecules

19. Diagram 19 shows the set-up of the apparatus for an electrolytic cell.

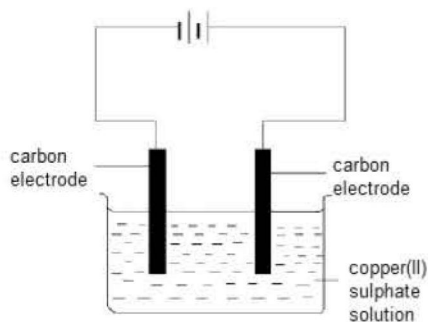


Diagram 19

Which of the following ions are attracted to anode and cathode?

	Anode	Cathode
A	SO_4^{2-}	Cu^{2+}
B	Cu^{2+}	OH^-
C	$\text{SO}_4^{2-}, \text{OH}^-$	$\text{Cu}^{2+}, \text{H}^+$
D	$\text{Cu}^{2+}, \text{H}^+$	$\text{SO}_4^{2-}, \text{OH}^-$

20. Which of the following is the energy change that occurs in the process of electrolysis?

- A electrical energy \rightarrow heat energy
- B potential energy \rightarrow chemical energy
- C electrical energy \rightarrow chemical energy
- D chemical energy \rightarrow electrical energy

21. Diagram 21 shows a cell.

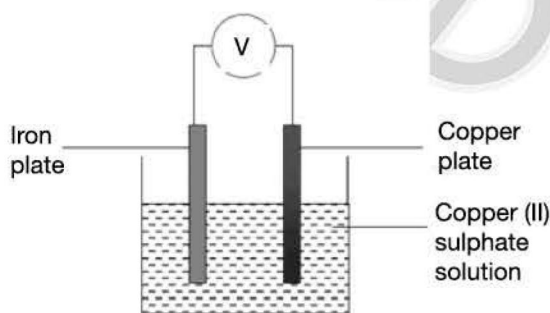


Diagram 21

Which of the following are true for the cell?

- I Chemical energy is changed into electrical energy.
- II Reduction process occurs at the iron plate.
- III Electron flows from copper plate to iron plate.
- IV voltmeter reading increases if iron plate is replaced with magnesium plate.

- A I and IV only
- B I and III only
- C II and III only
- D III and IV only

22. Table 22 shows the experimental results when metal X, Y and Z were immersed in the salt solutions of the nitrates of X and Y.

Solution/Metal	X	Y	Z
Solution of X nitrate	-	X is deposited	X is deposited
Solution of Y nitrate	No changes	-	No changes

Table 22

Which of the following shows the decreasing ability for the metals to ionize?

- A X, Z, Y
- B Y, Z, X
- C Z, X, Y
- D Y, X, Z

23. Which of the following is/are weak acid?

- I HCl
- II HNO_3
- III H_2SO_4
- IV CH_3COOH

- A I only
- B I and II
- C III and IV
- D IV only

24. Diagram 23 shows the reaction between calcium carbonate and glacial ethanoic acid.

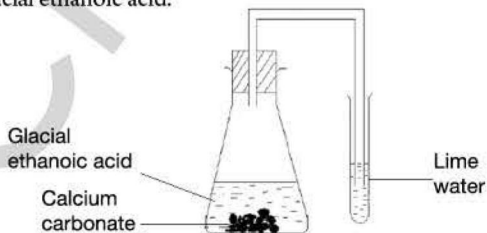


Diagram 23

No changes are observed after the reaction.

What should be done in order to make the lime water cloudy?

- A Change calcium carbonate chips to calcium carbonate powder.
- B Substitute calcium carbonate with zinc powder.
- C Shake vigorously the mixture.
- D Add water to the mixture.

25. Why ammonia solution is a weak alkali?

- A It has high pH value
- B It dissociates partially in water
- C It contains a lot of ammonium ions
- D It produces high concentration of hydroxide ions in the water

26. What is the volume of distilled water required to be added to 25.0 cm³ of 0.5 mol dm⁻³ sulphuric acid in order to produce a solution of 0.1 mol dm⁻³?

- A 75.0 cm³
- B 100.0 cm³
- C 125.0 cm³
- D 150.0 cm³

27. A few drops of phenolphthalein are added into nitric acid and sodium hydroxide solution respectively.

What is the colour of the solutions after phenolphthalein is added?

	Nitric acid	Sodium hydroxide solution
A	Pink	Colourless
B	Colourless	Purple
C	Colourless	Pink
D	Purple	Colourless

28. A salt always..

- A contains ions
- B dissolves in water
- C forms white crystals
- D conducts electricity

29. Which of the following salt is soluble in water?

- A Iron(II) sulphate
- B Silver chloride
- C Calcium carbonate
- D Lead(II) bromide

30. Diagram 30 shows steps in industrial preparation of sulphuric acid.

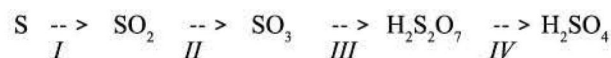


Diagram 30

Which of the following steps requires a catalyst?

- A I
- B II
- C III
- D IV

31. Which of the following is the main usage of the product in Haber Process?

- A To produce pesticides
- B To produce paint
- C To produce detergent
- D To produce fertilizers

32. Magnesium reacts with acid to produce hydrogen gas, H_2 . Which solution would give the highest initial rate of reaction?

- A 100 cm^3 of 1.0 mol dm^{-3} of nitric acid, HNO_3
- B 100 cm^3 of 1.0 mol dm^{-3} of hydrochloric acid, HCl
- C 100 cm^3 of 1.0 mol dm^{-3} of sulphuric acid, H_2SO_4
- D 100 cm^3 of 1.0 mol dm^{-3} of ethanoic acid, CH_3COOH

33. Which of the following explains the meaning of *effective collision*?

- A The collision where its energy is less than the activation energy
- B The collision that has a low energy
- C The collision which takes place before a reaction
- D The collision that causes a reaction

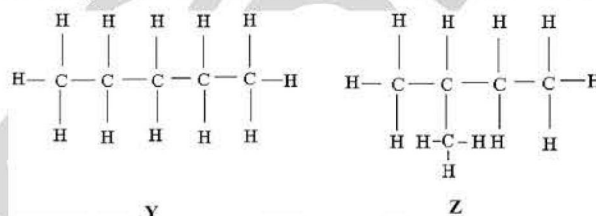
34. When propane is burned in excess oxygen, carbon dioxide and water are formed and is represented by the equation.



What are the values of r and s that balances the equation?

	r	s
A	1	3
B	1	5
C	3	4
D	3	8

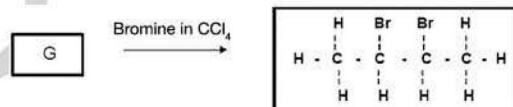
35. The diagram shows structural formulae of substances Y and Z.



Substance Y and Z have similar

- A boiling points
- B molecular formulae
- C structural formulae
- D IUPAC names

36. The diagram shows the chemical change that occurs to compound G.



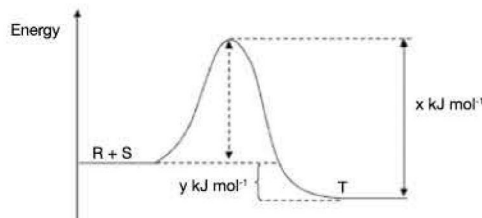
Which of the following is compound G?

- A n-butane
- B But-1-ene
- C But-2-ene
- D Butan-2-ol

37. The reaction between solution P and solution Q is exothermic. A student confirms this statements by mixing equal volumes of the two solutions and measuring the temperature change. Which two pieces of apparatus should the student use?

- A Balance and stop watch
- B Balance and thermometer
- C Pipette and stop watch
- D Pipette and thermometer

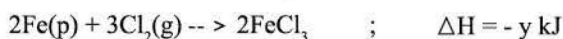
38. The diagram shows the energy profile for the formation of T from R and S.



What is the activation energy for the reaction?

- A $y \text{ kJ mol}^{-1}$ C $x \text{ kJ mol}^{-1}$
 B $(x + y) \text{ kJ mol}^{-1}$ D $(x - y) \text{ kJ mol}^{-1}$

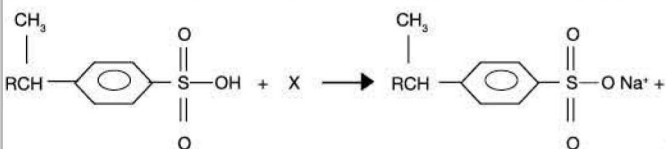
39. Below is a thermochemical equation.



What is the amount of heat released if 2 mol iron reacts with 3 mol chlorine gas?

- A $y/3 \text{ kJ}$ C $y \text{ kJ}$
 B $y/2 \text{ kJ}$ D $2y \text{ kJ}$

40. The following equation represents the preparation of detergent.



What is the pH value for solution X?

- A 2 C 9
 B 7 D 14

41. The cleansing effect of detergent is more effective in hard water compared to soap because detergent...

- A forms a soluble salt with metal ion in hard water
 B has hydrophobic part which is more soluble in hard water
 C has hydrophilic part which is more soluble in water
 D has hydrocarbon chain which makes detergent dissociate less in hard water

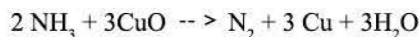
42. Which of the following statements is true about streptomycin?

- A Can kill viruses
 B Obtained from animal cells
 C A type of analgesic
 D Treats patients with diseases caused by bacteria

43. Stimulants are drugs which are classified as

- A psychotherapeutic
 B analgesic
 C antibiotic
 D hormone

44. The equation represents the redox reaction between ammonia and copper(II) oxide.



Which of the following is true about the reaction?

- A Ammonia is an oxidizing agent
 B Nitrogen is a reducing agent
 C Oxidation number of copper decreases from +2 to 0
 D Oxidation number of hydrogen increases from -1 to +1

45. Which of the following is an oxidation process?

- A Propene changes into propane
 B Lead(II) oxide loses its oxygen
 C Magnesium atom forms magnesium ion
 D Chlorine molecule gains electrons

46. What is the oxidation number of sulphur in $\text{Na}_2\text{S}_2\text{O}_3$?

- A +2 C +4
 B +3 D +6

47. Which of the underlined elements has the highest oxidation number?

- A $\underline{\text{K}_2}\underline{\text{Cr}_2}\text{O}_7$ C $\underline{\text{Pb}}\underline{\text{Cl}}_4$
 B $\underline{\text{Fe}}_2(\underline{\text{S}}\text{O}_4)_3$ D $\underline{\text{Cu}}_2\text{O}$

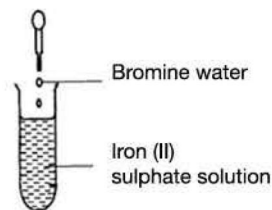
48. The oxidation number of copper increases when

- A Copper(II) carbonate powder is strongly heated
 B Copper(II) oxide reacts with dilute sulphuric acid
 C A piece of zinc strip reacts with copper(II) nitrate solution
 D A piece of copper strip reacts with silver nitrate solution

49. Which substance can be used to convert Fe^{2+} ions to Fe^{3+} ions?

- A Magnesium
 B Sulphur dioxide gas
 C Potassium manganate (VII) solution
 D Acidified potassium dichromate (VI) solution

50. The diagram shows the changes of iron(II) sulphate using bromine water.



Which of the following is true regarding the reaction?

- A Iron(II) ions are reduced
 B Bromine water is oxidized
 C Green solution turns brown
 D Iron(II) ions gain electron