ICSE · CLASS 10 · CHEMISTRY

ICSE Class 10 Chemistry Guess Paper 2027

Time: 2 hours · Maximum marks: 80 · 36 questions

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Section A

Compulsory. Q1 is fifteen multiple-choice questions (1 mark each); the remaining questions are short-answer, fill-in-the-blank, match-the-column, reasoning and short numerical parts.

Q1. Which statement given below is correct with reference to the flow of electric current? (a) In all aqueous solutions, current is carried by electrons. (b) In all acidic solutions, current is carried by ions. (c) In molten electrolytes, current is carried by electrons. (d) In metal wires, current is carried by ions. — 1 mark

Q2. What volume of carbon dioxide is produced at STP when 5 litres of propane is burnt completely according to: $C_3H_8 + 5O_2 \rightarrow 3CO_2 + 4H_2O$? (a) 10 litres (b) 15 litres (c) 20 litres (d) 25 litres — 1 mark

Q3. Copper, Zinc and Tin are the metals alloyed to form: (a) Duralumin (b) Brass (c) Bronze (d) Solder — 1 mark

Q4. The property exhibited by concentrated sulphuric acid when it is used to prepare hydrogen chloride gas from potassium chloride: (a) Dehydrating property (b) Drying property (c) Oxidizing property (d) Non-volatile acid property — 1 mark

Q5. Reaction of an alcohol with a carboxylic acid in the presence of concentrated H_2SO_4 is termed as: (a) Halogenation (b) Esterification (c) Hydrogenation (d) Dehydrohalogenation — 1 mark

Q6. The volume occupied by 0.2 moles of a gas at S.T.P. is: (a) 22.4 litres (b) 2.24 litres (c) 44.8 litres (d) 4.48 litres — 1 mark

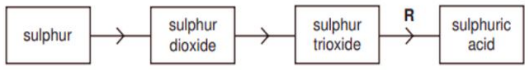
Q7. On passing ammonia gas over heated copper oxide for some time, a reddish-brown residue is left behind. What property of ammonia is demonstrated here? (a) Basic property (b) Oxidising property (c) Reducing property (d) Acidic property — 1 mark

Q8. A compound P is heated in a test tube with sodium hydroxide solution. A red litmus paper held at the mouth of the test tube turns blue. Which of the following could compound P be? (a) Zinc sulphate (b) Copper sulphate (c) Ferrous sulphate (d) Ammonium sulphate — 1 mark

Q9. Element 'P' has electronic configuration 2,8,8,1. The number of chlorine atoms present in the chloride of 'P' is: (a) 2 (b) 1 (c) 3 (d) 4 — 1 mark

Q10. The diagram represents the industrial process for the manufacture of concentrated sulphuric acid by the Contact process (sulphur -> sulphur dioxide -> sulphur trioxide -R-> sulphuric acid). What is used in step R to obtain sulphuric acid from sulphur trioxide? (a) vanadium pentoxide (b) water only (c) water followed by concentrated sulphuric acid (d) concentrated sulphuric acid followed by water

1 mark



What is used in step **R** to obtain sulphuric acid from sulphur trioxide?

Q11. X and Y are diatomic elements. X is less reactive than Y. What are elements X and Y? (a) X-chlorine, Y-iodine (b) X-fluorine, Y-nitrogen (c) X-iodine, Y-bromine (d) X-oxygen, Y-nitrogen

1 mark

Q12. A non-metal which reacts with concentrated sulphuric acid to form two gases which turn lime water milky is _____. (a) Sulphur (b) Carbon (c) Oxygen (d) Nitrogen

1 mark

Q13. The metallic hydroxide which forms a deep inky blue solution with excess ammonium hydroxide solution is: (a) $Fe(OH)_2$ (b) $Cu(OH)_2$ (c) $Ca(OH)_2$ (d) $Fe(OH)_3$

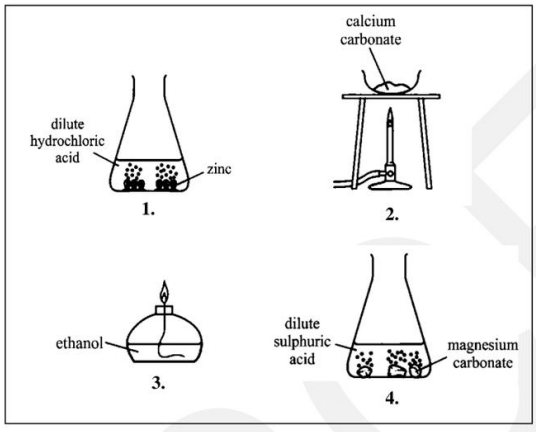
1 mark

Q14. Identify the ion that contains one lone pair of electrons. (a) OH^{-1} (b) H_3O^+ (c) NH_4^+ (d) H^+

1 mark

Q15. A teacher demonstrated four different reactions: 1. dilute hydrochloric acid + zinc 2. calcium carbonate heated 3. ethanol burning 4. dilute sulphuric acid + magnesium carbonate. Which reactions will produce water? (a) 1 and 2 (b) 1 and 3 (c) 3 and 4 (d) 2 and 3

1 mark



Q16. A compound commonly used in the laboratory has formula H_2P. H represents hydrogen, P represents a non-metal. Draw a dot and cross structure for the formation of the compound H_2P.

2 marks

Q17. State giving reasons if: (a) Zinc metal and aluminium metal can be distinguished by heating the metal powders separately in two different test tubes with concentrated sodium hydroxide solution. (b) Zinc nitrate and lead nitrate can be distinguished by adding ammonium hydroxide solution to the salt solution.

2 marks

Q18. The atomic number of two atoms 'X' and 'Y' are 14 and 8 respectively. State: (a) the period to which 'X' belongs. (b) the formula of the compound formed between 'X' and 'Y'. (Do not identify X and Y) — 2 marks

Q19. Identify the reactant and write the balanced equation for the following: Nitric acid reacts with compound Q to give a salt Calcium nitrate, water and carbon dioxide. — 2 marks

Q20. The following questions relate to the extraction of Aluminium by electrolysis. (a) Name the other compound which contains aluminium added to alumina. (b) Give a balanced equation for the reaction that takes place at the cathode. — 2 marks

Q21. You are provided with the list of chemicals in the box [Sodium hydroxide solution, copper carbonate, zinc, hydrochloric acid, copper, dilute sulphuric acid]. Using suitable chemicals from the list, write balanced chemical equation for the preparation of the salts: (a) copper sulphate (b) sodium zincate — 2 marks

Q22. Give one significant observation when: (a) Excess of chlorine gas reacts with ammonia. (b) Zinc nitrate is strongly heated in a test tube. — 2 marks

Q23. 20 grams of a gas M_2P has lesser number of moles than 20 grams of the gas MP. Justify the above statement using mathematical calculations. [At.wt. M=14, P=16] — 2 marks

Q24. In the reactivity series of metals, Z is a metal above hydrogen and its oxide has the formula ZO. It was found that ZO reacted with water and formed a hydroxide as the product. (a) State the number of valence electrons present in element Z. (b) Name the group which Z belongs to. (c) What will be the formula of the hydroxide of Z? — 3 marks

Q25. Complete and balance the following equations: (a) $C_2H_4Br_2$ + KOH (alcoholic) -> (b) NH_3 (excess) + Cl_2 -> (c) $C_{12}H_{22}O_{11}$ -(conc. H_2SO_4)-> — 3 marks

Q26. Rohit has three solutions X, Y and Z that have pH 2, 7 and 13 respectively. Which solution out of X, Y or Z will: (a) liberate sulphur dioxide gas when heated with sodium sulphite? (b) liberate ammonia gas when reacted with ammonium chloride? (c) not have any effect on litmus paper? — 3 marks

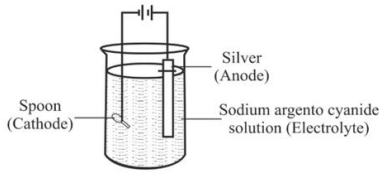
Section B

Attempt any four of the seven questions; each question is about 10 marks made up of short derivations, equations, numericals and reasoning sub-parts.

Q27. 8.2 grams of calcium nitrate is decomposed by heating according to the equation $2Ca(NO_3)_2$ -> $2CaO + 4NO_2 + O_2$. Calculate the following: (a) Volume of nitrogen dioxide obtained at STP. (b) Mass of CaO formed. [Atomic weights: Ca=40, N=14, O=16] — 4 marks

Q28. The diagram given below shows the electroplating of a spoon with silver (Silver anode, Spoon cathode, Sodium argentocyanide solution electrolyte). (a) Write an equation for the reaction that occurs at the cathode. (b) Silver nitrate solution is not preferred as an electrolyte in the above process. Give a reason. (c) Why is alternating current not used in the process? (d) What is the observation at the anode? 4 marks

reference to the diagram, answer the following questions:



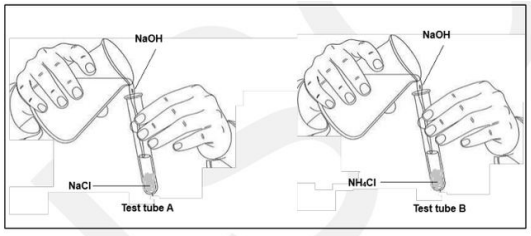
(a) Write an equation for the reaction that occurs at the cathode

Q29. The structures of five organic compounds, C, D, E, F and G are shown (C: alkene, D: alcohol, E: alkane, F: dibromo compound, G: alkene). State which compound C, D, E, F or G: (a) on halogenation will form F. (b) is an alcohol. (c) is an isomer of 2-methyl propane. (d) is in the same homologous series as ethene. 4 marks

Q30. An organic compound 'X' contains carbon, oxygen and hydrogen only. The percentage of carbon and hydrogen are 47.4% and 10.5% respectively. The relative molecular mass of 'X' is 76. Find the empirical formula and the molecular formula of 'X'. [Atomic weight: C=12, O=16, H=1] 4 marks

Q31. A chloride of iron 'R', when treated with sodium hydroxide gives P and Q as a product. Q is a reddish-brown precipitate. (a) Identify R. (b) State the formula of the compounds P and Q formed after the reaction. (c) What do you observe when excess NaOH is added to Q? 4 marks

Q32. Rohan has two test tubes, A containing sodium chloride and B containing ammonium chloride. He adds sodium hydroxide solution to both the test tubes and warms them gently. (a) In which test tube (A or B) will Rohan observe the evolution of a gas? (b) Name the gas that is evolved. (c) What will be the colour of the flame when this gas burns in oxygen? (d) Write an equation for the reaction that occurs in the test tube in which the gas has evolved. 4 marks

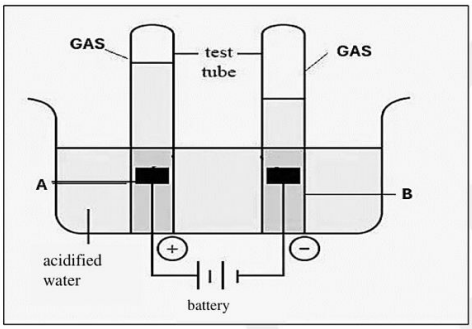


Q33. (a) Give the IUPAC name of the following organic compounds: 1. $HO\text{-}C(=O)\text{-}CH_2\text{-}CH_2\text{-}CH_3$ (a butanoic acid); 2. H-C-C-C-C-H chain with two methyl branches (a dimethylbutane). (b) Draw the structural diagram for the following compounds: 1. diethyl ether 2. isopentane 3. propanone. 4 marks

Q34. Match Column A with Column B. A: (a) Aluminium (b) Sulphuric acid (c) Calcination (d) Calcium Chloride (e) Carbon tetrachloride. B: 1. Covalent compound 2. Carbonate ore 3. Hall Heroult's process 4. Contact Process 5. Electrovalent compound 4 marks

Q35. Identify the following: (a) A bond formed between two atoms by sharing of a pair of electrons, with both electrons being provided by the same atom. (b) A salt formed by the complete neutralisation of an acid by a base. (c) A reaction in which the hydrogen of an alkane is replaced by a halogen. (d) The energy required to remove an electron from a neutral gaseous atom. (e) A homogenous mixture of two or more metals or a metal and a non-metal in a definite proportion in their molten state. 4 marks

Q36. The diagram shows the electrolysis of acidulated water (electrode A at positive, electrode B at negative). (a) Write an equation for the reaction that takes place at A. (b) Give a test to confirm the product formed at A. (c) Which gas is liberated at B? (d) Why is water acidified for electrolysis? (e) What is the ratio by volume of the gases liberated at A and B? 4 marks



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