INDIAN SCHOOL DARSAIT
FIRST MODEL EXAMINATION – JANUARY 2018
MODEL ANSWERS(CHEMISTRY)

Class: X

	SECTION A		
1.	(a) From among the metals, Sodium, Calcium, Aluminium, Copper and Magnesium, name the metal (i) which reacts with water only on boiling. -Magnesium (ii) which does not react even with steam. - Copper (b) What are the constituents of bronze? The constituents are copper and tin	2	1 1
2.	(a) State the constituents of the alloy solder. Which property of solder makes it suitable for welding electric wires? The constituents are tin and lead. It has a low melting point, so they are used to weld electric wires. (b) Give an example of a metal which reacts with very dilute nitric acid to evolve hydrogen gas. Magnesium/Manganese	2	1½ ½
3.	(a) Name any two metals that react violently with cold water. Sodium / Potassium (b) What are the constituents of brass? Copper and zinc	2	1 1
4.	(a) Differentiate between calcination and roasting. **Calcination** is heating of carbonate ore in the absence of air to get the oxide of the metal so that the metal can be extracted from the metal oxide. **Roasting** is the heating of sulphide ores in the presence of excess of air to get metal oxide to extract the metal from it. (b) Solid sodium chloride does not conduct electricity. Why? In solid sodium chloride, the constituents namely the sodium and chloride ions are not able to move because they are held by strong force of attraction	3	1 1 1
5.	(a) What is a redox reaction? It is the reaction in which both oxidation and reduction take place simultaneously. (b) Give an example each for thermal and photochemical decomposition reactions. Write relevant chemical equations also. Thermal decomposition reaction – It is the reaction in which a compound breaks into simpler products by heat. Example-2 $Pb(NO_3)_2$ (s) → 2 PbO (s) + 4 NO_2 (g) + O_2 (g) Photochemical decomposition – It is the reaction in which a compound breaks into simpler products by light. Sunlight Example-$2AgCl(s \rightarrow 2Ag(s)+Cl_2(g)$	3	1 1 1
6.	(a) What do you mean by rancidity? It is the oxidation of oil or fat present in the food so that the smell and the taste changes. (b) Identify the oxidising and reducing agent in the following reaction. $Fe_2O_3 + 2Al \rightarrow 2Fe + Al_2O_3$ Iron oxide undergoes reduction to iron. So Iron oxide is the oxidising agent. Aluminium undergoes oxidation and so it is the reducing agent.	3	1 1

	(c) Give an example for a combination reaction which is also exothermic. Reaction of calcium oxide with water is exothermic as well as combination reaction. $CaO(s) + H_2O(l) \rightarrow Ca(OH)_2(s)$		1
7.	Give reasons for the following: (a) Carbon cannot be used as reducing agent to obtain magnesium from magnesium oxide. Why? Magnesium is a reactive metal and so it has more affinity towards oxygen than carbon. Therefore carbon cannot remove oxygen from magnesium oxide. Thus carbon cannot reduce magnesium oxide to magnesium. (b) Aluminium oxide is considered as an amphoteric oxide. Aluminim oxide shows acidic and basic nature. It reacts with both acids and bases to form salt and water. (c) Ionic compounds conduct electricity in molten state. Ionic compounds conduct electricity because the ions are free to move freely and therefore makes ionic compounds conduct electricity in molten state.	3	1 1 1
8.	Give reasons for the following: (a) Carbonate and sulphide ores are usually converted into oxides during the process of extraction. It is easy to reduce metal oxide to the metal. Therefore carbonate and sulphide ores are converted into oxides. (b) Ionic compounds generally have high melting and boiling points. In ionic compounds, the ions are held together by strong force of attraction. Therefore, it has high melting and boiling point. (c) Copper vessels get a green coloured coating when left exposed to moist air. Copper articles react with oxygen, water and carbon dioxide to form basic copper carbonate or verdigris($CuCO_3.Cu(OH)_2$) This is green in colour.	3	1 1 1
9.	(a) How is Plaster of Paris prepared? Write the chemical equation for the reaction. Write its two important uses. Plaster of Paris is prepared by heating gypsum at 100 ^{0}C. $CaSO_4.2H_2O$---------->$CaSO_4$. ½H_2O + 1½ H_2O 1. Doctors use as plaster for supporting fractured bones in the right position. 2. It is used for making toys, materials for decoration and for making surfaces smooth. (b) What is the chemical name of bleaching powder? Write its chemical formula. Chemical name of bleaching powder is calcium oxy chloride. Formula is $CaOCl_2$ **OR** (a) What are strong and weak acids? Acids that give rise to more H^+ ions in water are said to be strong acids, and acids that give less H^+ ions in water are said to be weak acids. (b) How is tooth decay related to pH? Explain. Tooth decay starts when the pH of the mouth is lower than 5.5. Tooth enamel, made up of calcium phosphate is the hardest substance in the body. It does not dissolve in water, but is corroded when the pH in the mouth is below 5.5. Bacteria present in the mouth produce acids by degradation of sugar and food particles remaining in the mouth after eating. (c) Why does bee sting cause pain and irritation? Rubbing of baking soda on the area gives relief. How? Bee-sting leaves an **acid** which causes pain and irritation. Use of a mild **base** like baking soda on the stung area gives relief.	3	1 1 1 1 1 1
10.	(a) What is meant by homologous series of carbon compounds? A series of compounds in which the same functional group substitutes for hydrogen in a carbon chain is called a homologous series. Other features can also be written. (b) Classify the following carbon compounds into two homologous series and name them.		1

	C_3H_4, C_3H_6, C_4H_6, C_4H_8, C_5H_8, C_5H_{10} Alkynes: C_3H_4, C_4H_6, C_5H_8 Alkenes: C_3H_6, C_5H_{10}, C_4H_8 (c) Write the IUPAC names of the following compounds: (i) CH_3CH_2CHO Propanal and (ii) $CH_3CH_2CH_2COOH$ Butanoic acid **OR** (a) Name the gas liberated when ethanol reacts with Sodium metal? How do we get ethene from ethanol? Write chemical equation to justify your answer. State the role of acid in this reaction. Hydrogen gas is evolved when alcohol reacts with sodium metal. Ethanol on heating with conc. Sulphuric acid at 443K yields ethene. Here, conc. Sulphuric acid is a dehydrating agent that removes water. Equation- $C_2H_5OH(l)$ ---------> $C_2H_4(g) + H_2O(l)$. (b) An organic compound X of molecular formula C_2H_6O on oxidation with alkaline potassium permanganate gives an acidic compound Y. Compound X reacts with Y on warming in the presence of conc. H_2SO_4 to give a sweet smelling compound Z. What are X, Y and Z? Write the chemical equation showing the formation of Z from X and Y. X is Ethanol Y- Ethanoic acid Z- Ethyl ethanoate. Equation- $CH_3COOH + C_2H_5OH \rightarrow CH_3COOC_2H_5 + H_2O$	5	2 2 2½ 2½
11.	(a) Given below are some elements of the modern periodic table. Element: A, B, C, D, E Atomic number: 4, 9, 14, 19, 20 (i) Select the element that has one electron in the outermost shell. Also, write the electronic configuration of this element. Ans- D- 2,8,8,1 (ii) Which two elements among these belong to the same group? Which one is bigger in size? A and E belong to the same group(group 2) because they both have 2 electrons in the valence shell E is bigger in size because it has more number of shells compared to A. (iii) Identify the elements belonging to the same period of the periodic table. A and B----------2nd period ---2 shells D and E----------4th period-------4 shells (b) How does metallic character of elements vary on moving from (i) left to right in a period, and (ii) top to bottom in a group in the modern periodic table Give reasons for your answer.	5	1 1 1 2

	The metallic character decreases from left to right in a period in the periodic table because the size of the atoms decreases and therefore the electrons cannot be lost easily due to the greater force of attraction between the nucleus and the valence electrons. The metallic character increases from top to bottom in a group in the periodic table because the size of the atoms increases and therefore the electrons can be lost easily due to the lesser force of attraction experienced on the valence electrons by the nucleus.		
12	The following table shows the position of 7 elements A, B C, D, E, F and G in the periodic table:		

Groups → / Periods ↓	1	2	3 to 12	13	14	15	16	17	18
2	A				E	B			C
3	G	D							F

Using the above table answer the following questions:

(a) Which element will form only covalent compounds? Why? — 1

E, because it has 4 valence electrons. — ½

(b) Which element is metal with valency 2? — ½

D in group 2

(c) Which element is a non-metal with valency 3? — 1

B in group 15

(d) Out of A and G, Which one has bigger atomic radius and why? — 1

G is bigger in size because it has more shells than A

(e) Write a common name for the family of elements C and F. Noble gases — 1

(f) Write the formula for the oxide of 'D'. DO is the formula. MgO is an example for this

	SECTION B		
1	What do you observe when you add a few drops of acetic acid to a test tube containing (i) Sodium bicarbonate - Brisk effervescence with the evolution of carbon dioxide gas (ii) Distilled water - The acetic acid dissolves in distilled water and a clear solution is formed. (iii) Litmus solution – The colour changes from blue to red. (iv) Universal indicator- The colour changes to orange.	2	2x½
2	(a) Suggest a method to detect hardness in a given water sample. Add few drops of soap solution to the water sample. In the case of hard water, less foam will be formed and there is a formation of scum also. (b) What is the cause of hardness in water? The hardness of water is due to the calcium or magnesium salts. (Chlorides, sulphates or bicarbonates of calcium or magnesium)	2	1 1