

THE MOTHER'S INTERNATIONAL SCHOOL
 FIRST TERMINAL EXAMINATION 2016 - 2017
 CLASS - XII
 SUBJECT: CHEMISTRY

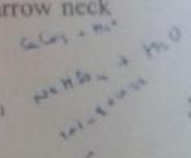
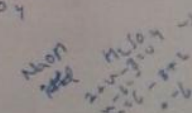
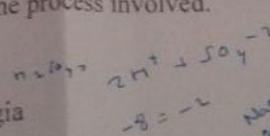
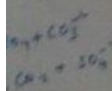
TIME: 3 HOURS

M.M.: 70

General Instruction :

- All Question are Compulsory
- Ques 1-5 : carry 1 mark
- 6-10 : carry 2 mark
- 11 -22 : carry 3 mark
- 23 : carry 4 marks
- 24 - 26 : carry 5 mark

- Q.1 Which substances are added to the molten ore in the Hall Heroult's process and why? 1
- Q.2 What is the advantage of a button cell? 1
- Q.3 Define isotropy with a relevant example. 1
- Q.4 List the reactions in a dry cell. 1
- Q.5 What are pi complexes? 1
- Q.6 a) For extraction of copper from low grade ores, zinc scrap and iron scrap are both available. Which is used and why? 2
 b) State 2 advantages of Ellingham diagram.
- Q.7 a) Which is the highest fluoride and highest oxide of Mn and why? 2
 b) Give balanced equation for the following- hydrogen sulphide is passed through acidified potassium permanganate.
- Q.8 a) Explain optical isomerism in complexes with relevant examples. 2
 b) Give one example of heteroleptic complexes.
- Q.9 a) Convert methyl chloride to N -ethylbenzamide. 2
 b) Convert benzene to sulphanilic acid.
- Q.10 How can you remove the hard calcium carbonate layer of the egg without damaging its semi permeable membrane? Can this egg be inserted into a bottle with a narrow neck without distorting its shape? Explain the process involved. 2
- Q.11 Give equations for: 3
 a) Reaction of Pt with aqua regia
 b) Sulphuric acid as an oxidizing agent
 c) Ammonia is bubbled through aqueous copper sulphate solution.
- Q.12 a) The standard reduction potential for nickel is more than expected. Why? 3
 b) Which element has the lowest enthalpy of atomization in the first transition series and why?
 c) The absorption bands of lanthanides are very narrow. Why?
- Q.13 a) State any 2 anomalous properties of fluorine. 3
 b) What happens when iodine trichloride is hydrolysed? Give relevant equation.
 c) How does basic character of hydrogen compounds of groups 15-16 vary down the group?



Q.14 a) What is the reagent for obtaining the bromo derivative of phenol from phenol and why?
 b) Give one example of reaction of alcohol involving cleavage of the OH bond.
 c) Compare the acidic character of water, phenol and alcohol.

2+1

Q.15 a) Describe contact process.
 b) Give one reaction to show disproportionation of phosphorus.

3

Q.16 a) Give the mechanism of acid catalyzed hydrolysis of propyl propionate.

b) Arrange the following compounds in increasing order of their property as indicated: Acetaldehyde, Acetone, Di-tert-butyl ketone, Methyl tert-butyl ketone - reactivity towards HCN

c) How will you bring about the following conversion in not more than two steps: Benzaldehyde to α -Hydroxyphenylacetic acid?

Q.17 a) Methylamine in water reacts with ferric chloride to precipitate hydrated ferric oxide. Why?

3

b) Explain the use of Hinsberg's reagent with the help of relevant equations.

Q.18 a) Calculate the potential of hydrogen electrode in contact with a solution whose pH is 10.

3

b) The conductivity of sodium chloride at 298 K has been determined at different concentrations and the results are given below:

Concentration/M	0.001	0.010	0.020	0.050	0.100
$10^2 \times \kappa / \text{S m}^{-1}$	1.237	11.85	23.15	55.53	106.74

Calculate Λ_m for all concentrations and draw a plot between Λ_m and $c^{1/2}$.

Find the value of Λ_m^0 .

Q.19 a) Calculate (a) molality (b) molarity and (c) mole fraction of KI if the density of 20% (mass/mass) aqueous KI is 1.202 g mL^{-1} .

3

b) Why are aquatic species more comfortable in colder waters?

Q.20 a) What is the increase in the mass of the cathode when 20 ampere of current is passed through brine for 20 mins?

3

b) What are the products of electrolysis of aqueous copper sulphate solution using copper electrodes?

c) What is overpotential?

Q.21 a) Write short note on Hofmann's bromamide reaction.

3

b) An aromatic compound 'A' on treatment with aqueous ammonia and heating forms compound 'B' which on heating with Br_2 and KOH forms a compound 'C' of molecular formula $\text{C}_6\text{H}_7\text{N}$. Write the structures and IUPAC names of compounds A, B and C. Draw the resonating structures of A.

Q.22 a) If the solubility product of CuS is 6×10^{-16} , calculate the maximum molarity of CuS in aqueous solution. 3

b) Determine the amount of CaCl_2 ($i=2.47$) dissolved in 2.5 litre of water such that its osmotic pressure is 0.75 atm at 27°C

Q.23 Arun and Ram realized that the refrigerator wasn't working properly. They employed a mechanic to repair the same. The mechanic said that the gas has to be refilled because it had leaked. Arun and Ram advised the mechanic to seal the container properly after refilling. 4

a) Which gas is being discussed here and why should the container be sealed carefully?

b) Which values are being exhibited by Arun and Ram?

c) Write short note on Finkelstein reaction.

Q.24 a) What is the structure of phenetole and resorcinol? 1+1.5+

b) Convert nitrobenzene to benzoquinone. +1.5

c) Give the mechanism of the reaction- 3-methylbutan-2-ol is treated with HBr,

d) How is ethanol manufactured commercially?

Q.25 a) Explain the change in conductivity of germanium crystals on doping with gallium. 1+2+

b) Calculate the packing efficiency of ccp.

c) An element with molar mass $2.7 \times 10^{-2} \text{ kg mol}^{-1}$ forms a cubic unit cell with edge length 405 pm. If its density is $2.7 \times 10^3 \text{ kg m}^{-3}$, what is the nature of the cubic unit cell?

Q.26 a) Reaction of aldehydes with pure HCN is very slow. How is the speed increased and why does it increase? 1+1+

b) What is Rochelle salt? Where is it used?

c) Can Gatterman-Koch reaction be considered similar to Friedel Craft's acylation? Discuss.

d) An alkene 'A' (Mol. formula C_5H_{10}) on ozonolysis gives a mixture of two compounds 'B' and 'C'. Compound 'B' gives positive Fehling's test and also forms iodoform on treatment with I_2 and NaOH. Compound 'C' does not give Fehling's test but forms iodoform. Identify the compounds A, B and C.