HALF YEARLY EXAMINATION, 2017-18
CHEMISTRY

Time : 3 hrs. **Class - XII** **M.M. : 70**

Name of the student _____ Section ____ Date-14.09.2017 (Thursday)

General instructions :
- *All questions are compulsory. Internal choice is there in some questions.*
- *Question nos. **1 to 5** are very short answer questions carrying **1 mark** each.*
- *Question nos. **6 to 10** are short answer questions carrying **2 marks** each.*
- *Question nos. **11 to 22** are short answer questions carrying **3 marks** each.*
- *Question no. **23** is a value based question carrying **4 marks**.*
- *Question nos. **24 to 26** are long answer questions carrying **5 marks** each.*
- *Use of calculator is strictly prohibited.*
- *Use log table if necessary.*

Q.1 How may be the conductivity of an intrinsic semiconductor increased? (1)

Q.2 What do you mean by inert electrodes? (1)

Q.3 The rate of decomposition of dimethylether when measured in terms of partial pressure of dimethyl ether is Rate = K $(^PCH_3OCH_3)^{3/2}$. If the pressure is measured in bar and time in minutes what are the units of rate and rate constant? (1)

Q.4 Out of $BaCl_2$ and KCl which is more effective in causing coagulation of metal sol and why? (1)

Q.5 Name a drug that acts both as an antipyretic and analgesic. Also give its chemical name. (1)

Q.6 In a cubic close packed structure of a mixed oxide one-eighth of tetrahedral voids are occupied by divalent X^{2+} while one half of the octahedral voids are occupied by trivalent Y^{3+}. What is the formula of the compound? (2)

Q.7 Define the following : (2)

a) Pseudo first order reaction. b) Half life of a reaction.

OR

Write two differences between molecularity and order of a reaction.

Q.8 What are the characteristics of the following colloids. Give one example of each (2)

a) Multimolecular colloid b) Lyophobic colloid

Q.9 Write the differences between physisorption and chemisorption with respect to the following : (2)

a) Specificity b) Temperature dependence

c) Reversibility d) Enthalpy change

Q.10 Why is H_3PO_2 a stronger reducing agent than H_3PO_3. Give reason and give a reaction to show the reducing property of H_3PO_2. (2)

Q.11 An element occurs in BCC structure and has a cell edge of 250 pm. Calculate molar mass of the element if its density is 8 gm cm^{-3}. Also calculate the radius of an atom of the element. (3)

Q.12 Explain the terms : (3)

a) F-centre   b) Ferrimagnetism   c) Schottky defect

Q.13 The freezing point of a solution containing 50 cm^3 of ethylene glycol in 50g of water is found to be -34^{0}C. Calculate density of ethylene glycol. (k$_f$ for water is 1.86 K Kg mol^{-1}, molar mass of ethylene glycol = 62 g mol^{-1}) (3)

Q.14 a) What will the value of Van't Hoff factor for a dilute solution of K$_2$SO$_4$ in water? (3)

b) State the condition of reverse osmosis.

c) What are isotonic solutions?

Q.15 Determine the osmotic pressure of a solution containing 2.5×10^{-2} g of K$_2$SO$_4$ in 2L of water at 25^{0}C assuming that it is completely dissociated. (R = 0.0821 L Atm K^{-1} mol^{-1} and molar mass of K$_2$SO$_4$ = 174 g mol^{-1}). (3)

Q.16 Iron may be protected from rusting by galvanization or tinning. By referring to the data given below explain why galvanization protects iron more effectively than tinning? (3)

$Zn^{2+} + 2e^- \rightarrow Zn$ E^0 = - 0.76V

$Fe^{2+} + 2e^- \rightarrow Fe$ E^0 = - 0.44V

$Sn^{2+} + 2e^- \rightarrow Sn$ E^0 = - 0.14V

Q.17 Sucrose decomposes in acid solution into glucose and fructose according to the first order rate law with half life of 3 hrs. What fraction of sucrose will remain after 8 hours? (3)

Q.18 a) Illustrate graphically the effect of catalyst on activation energy of a reaction. (3)

b) Catalysts have no effect on the equilibrium constant of a reversible reaction. Why?

OR

The temperature co-efficient for the saponification of ethyl acetate by NaOH is 7.75. Calculate activation energy of the reaction. (R = 8.314 J K^{-1} mol^{-1})

Q.19 a) A sol of AgI can be positively or negatively charged. Explain how and why? (3)

b) Define zeta potential.

Q.20 Answer any two of the following : (3)

a) Name the method used for vapour phase refining of Titanium. Write the reactions involve.

b) Write the principle and process of hydraulic washing.

c) Which solution is used for leaching of gold? Write the reaction involved in the leaching of gold from native gold.

Q.21 a) Out of C and CO which is a better reducing agent in the lower temperature range in the blast furnace to extract iron from iron oxide? Why? (3)

b) How is copper obtained from a low grade copper ore? What is this process called?

Q.22 Draw the structures of the following : (3)

a) (HPO$_3$)$_3$ b) N$_2$O$_5$ c) H$_2$S$_2$O$_7$

Q.23 Due to his hectic schedule Mr. Angad's life was full of tensions and he suffered from anxiety and insomnia. To overcome this he started taking sleeping pills without consulting any doctor. Mr. Deepak his close friend advised him to stop taking sleeping pills and suggested to change his life style by doing yoga, meditation and some physical exercise. Mr. Angad followed his friend's advice and after a few days, he (4)

started feeling better. After reading the above passage answer the following questions:

a) Why is it not advisable to take sleeping pills without consulting doctor?

b) What are tranquillisers? Give one example.

c) What are the values (at least two) displayed by Mr. Deepak.

Q.24 a) Name the type of cell which was used in Apollo space programme for providing electrical power. Write two advantages of this type of cell. (5)

b) Conductivity of 2.5×10^{-4} M methanoic acid is 5.02×10^{-5} S cm^{-1}. Calculate its degree of dissociation.

(Given λ^0 (H$^+$) = 349.5 S cm^2 mol^{-1} and λ^0 (HCOO$^-$) = 50.5 S cm^2 mol^{-1})

OR

a) How many molecules of chlorine will be obtained from molten sodium chloride in one minute by a current of 300 mA. (Cl= 35.5 u, Na = 23 u)

b) Calculate emf of the following cell at 25^0C.

Fe | Fe^{2+} (0.001M) || H$^+$ (0.01M) | H$_2$(g) | 1 bar | Pt(s)

$E^0_{Fe^{2+}/Fe}$ = -0.44 V, $E^0_{H^+/H_2}$ = 0.00V

Q.25 a) What happens when (give equation) (5)

 i) PCl$_5$ is heated　　　　　ii) H$_3$PO$_3$ is heated

b) Explain with reasons.

 i) N – N single bond is weaker than P – P bond.

 ii) PH$_3$ is a weaker base than NH$_3$.

 iii) White phosphorus is more reactive than red phosphorous.

OR

Answer the following questions :

a) Why oxygen is a gas while sulphur is a solid?

b) Sulphur in vapour state exhibits paramagnetism why?

c) How the super sonic jet aeroplanes are responsible for ozone depletion.

d) Complete the equation : Cu + HNO$_3$ (dilute) $\rightarrow$

e) Why does NO$_2$ dimerise?

Q.26 a) Write the name and structure of one of the common initiators used in free radical addition polymerization? (5)

b) Differentiate thermoplastic and thermosetting polymers. Give one example of each.

c) Write the name and structure of the monomer of the polymer neoprene.

d) Define the term homopolymerisation. Give one example.

e) Give the reaction involved in the formation of Buna-S.

OR

a) Give an example of biodegradable aliphatic polyester. Write its structure.

b) Write the structure of monomers of Dacron.

c) Write the reaction involved in the formation of novolac.

d) Write the name and structure of the polymer which is also known as orlon.

e) Why do LDP and HDP differ in their densities?