



**Maharashtra Education Society's  
Jr. Colleges / Higher Secondary Schools**

**Prelim Examination (2018-19)**

**Std. – XII Science**

**Date - 10/01/2019**

**Marks -70**

**Subject - CHEMISTRY**

**Time- 3 Hrs.**

**Instructions :**

- i) All questions are compulsory.
- ii) Draw neat labelled diagrams and write balanced chemical equations wherever necessary.
- iii) Question paper consists of 29 questions divided into **FOUR** sections , namely A, B, C and D .
- iv) **Section A** :Select and write the most appropriate answer from the given alternatives for Q.No.1 to 4 of multiple choice type of questions carrying one mark each. Q. No. 5 to 8 are very short answer type questions carrying one mark each.
- v) **Section B** contains Q.No. 9 to 15 of short answer I type questions carrying two marks each. Internal choice is provided to only one question.
- vi) **Section C** contains Q.No. 16 to 26 of short answer II type questions carrying three marks each. Internal choice is provided to only one question.
- vii) **Section D** contains Q.No. 27 to 29 of long answer type questions carrying five marks each. Internal choice is provided to each question.
- viii) For each MCQ , correct answer must be written along with its alphabet ,  
e.g.(a) ...../ (b) ..... / (c) ..... / (d) .....
- ix ) In case of MCQ ( i.e. Q.1 to Q. 4 ) ,evaluation would be done for the first attempt only.
- x) Start each section on new page .
- xi ) Figures to the right indicate full marks .
- xii) Use log table if necessary. Use of calculator is **not** allowed.

Given :Atomic mass of H = 1, C = 12, N = 14, O = 16,  $R = 8.314 \text{ JK}^{-1} \text{ mol}^{-1}$

## SECTION A

[8]

- Q.1 The basicity of phosphorus acid ( $\text{H}_3\text{PO}_3$ ) is (1)  
 a) one      b) two      c) four      d) three
- Q.2 The cell constant of conductivity cell is  $1.09\text{cm}^{-1}$ . If the electrodes are  $0.98\text{cm}$  apart then the cross sectional area of the electrode is (1)  
 a)  $0.918\text{m}^2$       b)  $1.112\text{cm}^2$       c)  $0.899\text{cm}^2$       d)  $1.0682\text{cm}^2$
- Q.3 Stachyose is an example of (1)  
 a) monosaccharide      b) disaccharide  
 c) trisaccharide      d) tetrasaccharide
- Q.4 The process involving heating of natural rubber with sulphur is known as (1)  
 a) sulphonation      b) vulcanization  
 c) galvanization      d) calcination
- Q.5 Write a chemical reaction used to distinguish between alcohol and phenol. (1)
- Q.6 State Arrhenius parameters in Arrhenius equation. (1)
- Q.7 Predict with reason the sign of  $\Delta S$  for the following reaction. (1)  

$$\text{N}_2(\text{g}) + 3\text{H}_2(\text{g}) \longrightarrow 2\text{NH}_3(\text{g})$$
- Q.8 Write IUPAC name of  $\text{C}_2\text{H}_5\text{N}(\text{CH}_3)_2$ . (1)

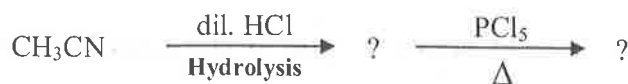
## SECTION B

[14]

- Q.9 Explain the anomalous behaviour of nitrogen (any four points) (2)
- Q.10 How is ethyl bromide converted into, (2)  
 a) ethyl acetate      b) ethyl cyanide ?
- Q.11 Distinguish between lanthanoids and actinoids. (2)
- Q.12 Bond enthalpy of  $\text{N}_2$  is  $945\text{kJmol}^{-1}$ . If  $10\text{kJ}$  heat is supplied to one mole of nitrogen how many molecules of nitrogen will be dissociated in free atoms? (2)
- Q.13 Draw a neat and labelled diagram of standard hydrogen electrode. (2)
- Q.14 In a first order reaction  $\text{A} \rightarrow \text{B}$ ,  $60\%$  of the given sample of compound decomposes in  $45$  minutes. Calculate the rate constant of the reaction. (2)
- Q.15 How are following compounds prepared by using geminal dihalides? (2)  
 a) Ethanal      b) Propanone

OR

- Q.15 Complete, balance and rewrite the following chemical equations.



## SECTION- C

[33]

- Q.16 Determine the density of cesium chloride which crystallizes in a bcc type structure with the edge length 412.1 pm. The atomic masses of Cs and Cl are 133 and 35.5 respectively. (3)
- Q.17 Write the names and structural formulae of the raw materials used in preparation of terylene. What is the effect of catalyst on the energy of activation of reaction? (3)
- Q.18 The vapour pressure of pure benzene is 640 mm Hg. A non volatile solute of mass  $2.175 \times 10^{-3}$  kg is added to 39.0 g of benzene. The vapour pressure of solution is 600 mm Hg. Calculate molar mass of the solute. (3)
- Q.19 How is carboic acid prepared by using isopropyl benzene? What is the action of HI on methoxyethane at 273K? (3)
- Q.20 Explain the structure of permanganate ion. Give any two uses of potassium dichromate. (3)
- Q.21 Define effective atomic number (EAN). Find EAN of Fe in  $K_4[Fe(CN)_6]$ . (Atomic number of Fe = 26). Write IUPAC name of  $[Pt(NH_3)_2Cl_2]$ . (3)
- Q.22 Explain the structure of  $SO_2$  molecule. Which noble gas is radioactive? (3)
- Q.23 Explain the mechanism of cleansing action of soap. (3)
- Q.24 Define peptide linkage. Explain the commercial method of preparation of glucose. (3)
- Q.25 What is action of nitrous acid on following? (3)  
a) ethylamine    b) aniline    c) nitroethane
- Q.26 Define extensive property. Calculate the enthalpy change for the reaction at 298K. (3)
- $$4NH_{3(g)} + 3O_{2(g)} \rightarrow 2N_{2(g)} + 6H_2O_{(l)}$$
- Given that the enthalpy of formation at 298K for  $NH_{3(g)}$  and  $H_2O_{(l)}$  are -46 kJ/mol and -286 kJ/mol respectively.

OR

- Q.26 Write mathematical equation for the first law of thermodynamics.  
16 g oxygen gas was expanded isothermally and reversibly at 300 K to twice the original volume. Calculate the maximum work done considering the ideal behaviour of  $O_2$  gas.

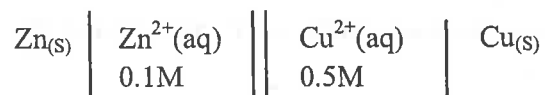
## SECTION- D

[15]

Q.27 What is the action of chlorine on following elements?

- a) Na                      b) Sb

Calculate emf of the following cell at 25° C.



Standard reduction potentials of zinc and copper are  $-0.76\text{V}$  and  $0.334\text{V}$  respectively.

Define Schottky defect.

(5)

OR

Q.27 What is the action of heat on following compounds ?

- a)  $\text{KClO}_4$                       b)  $\text{KNO}_3$

An electric current of 500 mA is passed through an electrolyte for 1 hour and 30 minutes, calculate the quantity of electricity passed in Faraday.

What is polymorphous?

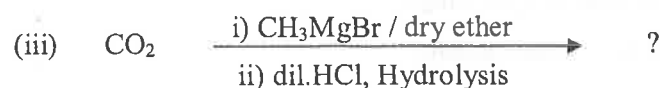
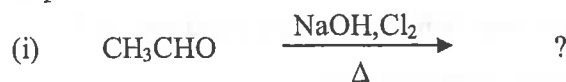
Q.28 Write the mechanism of aldol addition reaction.

Derive the relation between elevation of boiling point and molar mass of the solute.

(5)

OR

Q.28 Complete and rewrite the balanced chemical reactions.



State and explain van't Hoff Boyle's law.

Q.29 Define smelting. Explain refining of nickel by Mond process.

Write preparation of ethyl iodide from

- a) ethyl alcohol                      b) ethene.

(5)

OR

Q.29 Define flux. Explain the magnetic separation method.

How is chlorobenzene converted into following compounds ?

- a) Cynobenzene                      b) Aniline

