BOARD QUESTION PAPER : JULY 2019

CHEMISTRY

Time: 3 Hours **Total Marks: 70**

Notes:

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 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 MCQs**, correct answer must be written along with its alphabet,
e.g., (A) ……. / (B) ……. / (C) ……. / (D) ……. etc.

ix. In case of **MCQs,** (i.e. Q. No. **1** to **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:

$R = 8.314\ J\ K^{-1}\ mol^{-1}$,

Atomic weights: H = 1, C = 12, N = 14, O = 16, Cl = 35.

SECTION A

Q.1 The molecular formula of Galena is _____. (1) **[8]**

(A) PbS (B) Cu_2S

(C) ZnS (D) FeS_2

Q.2 The hormone which maintains sugar level in human blood is _____. (1)

(A) Thyroxine (B) Adrenaline

(C) Insulin (D) Androgen

Q.3 1 gram NaOH is dissolved in $\frac{1}{4}\ dm^3$ of water. The molarity of solution is _____. (1)

(A) 0.001 M (B) 0.01 M

(C) 0.1 M (D) 1 M

Q.4 Non narcotic analgesic is _____. (1)

(A) Aspirin (B) Codeine

(C) Heroin (D) Morphine

Q.5 Write IUPAC name of $[Pt(en)_2Cl_2]^{2+}$ complex ion. (1)

Q.6 Conversion of carbon into carbon dioxide can not perform the work. Give reason. (1)

Q.7 Write the name of an inert gas element used in the treatment of cancer by radiotherapy. (1)

Q.8 Give the relation between radius of atom and edge length in body centered cubic crystal. (1)

SECTION B

Q.9 Explain linkage isomerism. (2) **[14]**

Q.10 Define the following terms:
i. Soap ii. Antifertility drugs (2)

Q.11 Prepare nitrogen gas by using the following compound:
i. NH_4Cl ii. $CaOCl_2$ (2)

OR

Write chemical reaction that takes place in preparing Holme's signal.

Q.12 Explain Bessemerization process. (2)

Q.13 Distinguish between Lanthanoids and Actinoids. (2)

Q.14 The molar conductivity of 0.02M HCl solution is 407.2 Ω^{-1} cm^2 mol^{-1} at 25°C. Calculate its conductivity. (2)

Q.15 Write the reactions for the preparation of polymer by using the following monomers:
(i) Vinyl chloride
(ii) Tetrafluoroethene (2)

SECTION C

Q.16 Explain the role of iodic acid in the preparation of ethyl iodide from ethane. Dilactic acid is optically inactive. Why? (3) **[33]**

Q.17 Define osmotic pressure.
Write mathematical expression between cryoscopic constant and molar mass of solute.
To convert Cu^{2+} to Cu, what quantity of Faradays of electricity is required? (3)

Q.18 PH_3 has low boiling point than NH_3. Why?
Complete the following reaction: $Sn \xrightarrow[\Delta]{PCl_5}$ (3)

Q.19 The half life of first order reaction is 6.0 hours. How long it will take for the concentration of reactant to decrease from 0.8 M to 0.25 M. (3)

OR

For a certain second order reaction energy of activation is 240 kJ mol^{-1}. Calculate its rate constant at 1023 K if the rate constant at 923 K is 0.0113 $M^{-1}S^{-1}$.
(R = 8.314 J K^{-1} mol^{-1}).

Q.20 Give IUPAC name of $(CH_3)_3C - \underset{\displaystyle OH}{\underset{|}{CH}} - C_2H_5$
Convert the following:
i. Ethanal into ethanal cyanohydrin.
ii. 3,5-dinitrobenzoic acid into 3,5-dinitrobenzoyl chloride. (3)

Q.21 Write the following conversions:
i. Acetaldoxime into ethyl amine
ii. Ethoxyethane into ethanol
iii. Carbolic acid into p-phenol sulphonic acid (3)

Q.22 Classify the following solids:

i. Diamond ii. NaCl

iii. P_4 molecule iv. Brass

What is Schottky defect? (3)

Q.23 Define enzyme.

Amines are basic in nature. Explain. (3)

Q.24 How are the following conversions carried out ? (3)

(i) Dry ice into ethanoic acid (ii) Glucose into n-hexane

(iii) Glucose into glucoxime ?

Q.25 Write a note on lanthanoid contraction. (3)

Write two uses of $KMnO_4$.

Q.26 Define the term enthalpy. (3)

Classify the following properties into intensive and extensive properties :

(i) Pressure (ii) Density (iii) Work (iv) Heat

SECTION D

Q.27 Derive $\pi = CRT$ **[15]**

Draw neat, labelled diagram of $H_2 - O_2$ fuel cell.

Define homopolymer.

OR

Define the following terms :

(i) Molality (ii) Mole fraction

Draw neat, labelled diagram of standard hydrogen electrode.

Define condensation polymer.

Q.28 Convert benzene diazonium halide into aryl iodide.

The layer of ozone acts as a protective umbrella. Explain.

Write aldol condensation reaction between ethanal and propanal.

OR

What is the action of benzene sulphonyl chloride on ethanamine. Explain bleaching action of chlorine. Write a note on Fischer esterification.

Q.29 Define elementary reaction.

Write conversion of 2-bromobutane into unsaturated hydrocarbon by using alcoholic KOH.

Calculate work done by the following chemical reaction:

$2NH_4NO_{3(s)} \xrightarrow{373\,K} 2N_2O_{(g)} + 4H_2O_{(g)}$

State whether work is done on the system or by the system.

Give two uses of ethanol. (5)

OR

A reaction occurs by the following mechanism:

(i) $NO_{2(g)} + F_{2(g)} \rightarrow NO_2F_{(g)} + F_{(g)}$

(ii) $F_{(g)} + NO_{2(g)} \rightarrow NO_2F_{(g)}$

Identify the intermediate and write net reaction.

Write the reaction for preparation of Grignard's reagent.

Determine whether the following reaction is exothermic or endothermic and spontaneous or non-spontaneous for the given data : $\Delta H = -110kJ$ and $\Delta S = +40Jk^{-1}$ at 400 K.

Write IUPAC name of pyrogallol.