

BOARD QUESTION PAPER : JULY 2019

CHEMISTRY

Time: 3 Hours

Total Marks: 70

Notes:

- All questions are compulsory.
- Draw neat, labelled diagrams and write balanced chemical equations wherever necessary.
- Question paper consists of **29** questions divided into **FOUR** sections, namely **A, B, C** and **D**.
- 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.
- 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.
- 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.
- Section D** contains Q. No. **27** to **29** of **long answer** type questions carrying **five marks** each. Internal choice is provided to **each** question.
- For **each MCQs**, correct answer must be written along with its alphabet, **e.g., (A) / (B) / (C) / (D) etc.**
- In case of **MCQs**, (i.e. Q. No. **1** to **4**), evaluation would be done for the first attempt only.
- Start each section on new page.
- Figures to the right indicate full marks.
- Use log table if necessary. Use of calculator is **not** allowed.

Given:

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

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) Cu₂S
(C) ZnS (D) FeS₂
- 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 $\frac{1}{4}$ dm³ 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)₂Cl₂]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 $407.2 \Omega^{-1} \text{ cm}^2 \text{ mol}^{-1}$ 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: $\text{Sn} \xrightarrow[\Delta]{\text{PCl}_5}$ (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 $0.0113 \text{ M}^{-1}\text{S}^{-1}$.

($R = 8.314 \text{ J K}^{-1} \text{ mol}^{-1}$).

- Q.20 Give IUPAC name of $(\text{CH}_3)_3\text{C} - \overset{\text{OH}}{\underset{|}{\text{CH}}} - \text{C}_2\text{H}_5$
 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. P₄ 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 KMnO₄.
- 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 H₂ – O₂ 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.

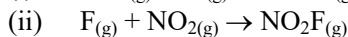
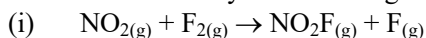
- Q.29** Define elementary reaction.
 Write conversion of 2-bromobutane into unsaturated hydrocarbon by using alcoholic KOH.
 Calculate work done by the following chemical reaction:

$$2\text{NH}_4\text{NO}_3(\text{s}) \xrightarrow{373\text{K}} 2\text{N}_2\text{O}(\text{g}) + 4\text{H}_2\text{O}(\text{g})$$

 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:



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 : $\Delta H = -110\text{kJ}$ and $\Delta S = +40\text{Jk}^{-1}$ at 400 K.

Write IUPAC name of pyrogallol.