

Chemistry (Theory)

[Time allowed: 3 hours]

[Maximum marks:70]

General Instructions:

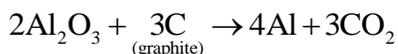
- (i) All questions are compulsory.
 (ii) Marks for each question are indicated against it.
 (iii) Question numbers 1 to 8 are very short-answer questions and carry 1 mark each.
 (iv) Question numbers 9 to 18 are short-answer questions and carry 2 marks each.
 (v) Question numbers 19 to 27 are also short-answer questions and carry 3 marks each.
 (vi) Question numbers 28 to 30 are long-answer questions and carry 5 marks each.
 (vii) Use Log Tables, if necessary. Use of calculators is not allowed.

Q1. What is meant by ‘doping’ in a semiconductor? **1**

Ans. Doping is the process of increasing the conductivities of the intrinsic semiconductors by adding suitable impurity.

Q2. What is the role of graphite in the electrometallurgy of aluminium? **1**

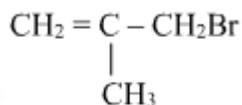
Ans. In the metallurgy of aluminium, steel cathode and graphite anode are used. The graphite anode is useful for the reduction of Al_2O_3 into Al.



Q3. Which one of PCl_4^+ and PCl_4^- is not likely to exist and why? **1**

Ans. PCl_4^- is not likely to exist because the oxidation state of P is +3 here, which is less stable.

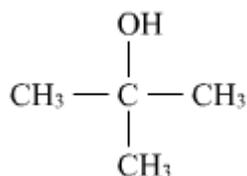
Q4. Give the IUPAC name of the following compound. **1**



Ans. 3-Bromo-2-methylpropene

Q5. Draw the structural formula of 2-methylpropan-2-ol molecule. **1**

Ans.



Q6. Arrange the following compounds in an increasing order of their reactivity in nucleophilic addition reactions: ethanol, propanal, propanone, butanone. **1**

Ans. butanone < propanone < propanal < ethanol

Q7. Arrange the following in the decreasing order of their basic strength in aqueous solutions: CH_3NH_2 , $(\text{CH}_3)_2\text{NH}$, $(\text{CH}_3)_3\text{N}$ and NH_3 **1**

Ans. $(\text{CH}_3)_2\text{NH} > \text{CH}_3\text{NH}_2 > (\text{CH}_3)_3\text{N} > \text{NH}_3$

Q8. Define the term, 'homopolymerisation' giving an example. **1**

Ans. The addition polymers formed by the polymerisation of single monomeric species are known as homopolymers and the process is known as homopolymerisation.

Eg. Formation of polyethene

