

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 number **1** to **8** are very short-answer questions and carry **1** mark each.
- (iv) Question number **9** to **18** are short-answer questions and carry **2** marks each.
- (v) Question number **19** to **27** are also short-answer questions and carry **3** marks each.
- (vi) Question number **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. How would you distinguish between a metallic solid and an ionic solid other than by metallic luster? **1**

Ans: **Ionic solids:** - They are poor conductor of electricity and therefore are insulators in solid state.

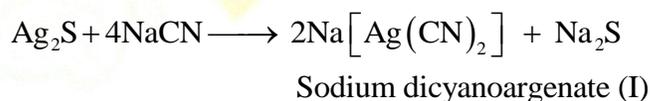
Metallic solids: - They are good conductors of electricity and heat in solid state.

Q2. What is meant by 'shape selective catalysis'? **1**

Ans: The catalytic reaction that depends upon the pore structure of the catalyst and the size of the reactant and product molecules is called shape-selective catalysis. Zeolites are good shape-selective catalysts.

Q3. Write the reaction involved in the extraction of silver after the silver ore has been leached with NaCN. **1**

Ans: The following reaction is involved in the extraction of silver after the silver ore has been leached with NaCN.



Q4. Which is more acidic and why H₂O or H₂S? **1**

Ans: H₂S is more acidic than H₂O. The increase in acidic character can be explained in terms of decrease in bond dissociation enthalpy down the group.

Q5. Of the two alcohols;

(a) CH₂ = CH – CH₂OH and

(b) CH₂ = CH – CH₂ – CH₂OH, which one will react more easily with conc. HCl in the presence of ZnCl₂? **1**

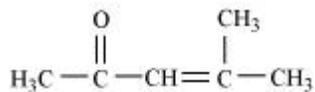
Ans: $\text{CH}_2 = \text{CH}-\text{CH}_2\text{OH}$ will be more reactive than $\text{CH}_2 = \text{CH}-\text{CH}_2\text{CH}_2\text{OH}$

Reason: In the reaction of alcohol with the HCl in presence of ZnCl_2 , cleavage of the C–O bond takes place. In first alcohol, OH group is present to the allylic carbon so formation of partial double bond between C–2 and C–3 takes place due to resonance resulting weakening of bond between C and O.



Q6. Draw the molecular structure of the compound 4-methylpent-3-en-2-one. **1**

Ans:



Q7. What is meant by ‘narrow spectrum antibiotics’? **1**

Ans: The antibiotics effective mainly against Gram-positive or Gram-negative bacteria are known narrow spectrum antibiotics. For example Penicillin G

Q8. Of the two bases named below, which one is present in RNA and which one is present in DNA?

(i) Thymine

(ii) Uracil

1

Ans: (i) Thymine is present in DNA

(ii) Uracil is present in RNA