



Name :

Roll No. :

Invigilator's Signature :

CS/B.Sc (H)/BT/GEN/Micro. Bio./Mol. Bio./SEM-2/CH-201/2013

**2013
CHEMISTRY**

Time Allotted : 3 Hours

Full Marks : 70

The figures in the margin indicate full marks.

*Candidates are required to give their answers in their own words
as far as practicable.*

GROUP – A

(Multiple Choice Type Questions)

1. Choose the correct alternatives for any *ten* of the following : 10 × 1 = 10

i) Halogenation of alkanes occurs through

- a) Radical
- b) Carbene
- c) Carbocation
- d) Carbanion.

ii) Hydration of alkenes gives

- a) Aldehyde
- b) Alcohol
- c) Acid
- d) Amine.



- iii) What is the limiting radius ratio for ZnS type crystals ?
- a) 0.225 – 0.414 b) 0.414 – 0.732
- c) 0.732 – 0.783 d) none of these.
- iv) $PV^\gamma = \text{constant}$ for
- a) isothermal process
- b) adiabatic process
- c) reversible process
- d) cyclic process.
- v) The mathematical expression of 1st law of thermodynamics is
- a) $dQ = dE - PdV$ b) $dQ = dE/PdV$
- c) $dQ = dE + PdV$ d) $dQ = \Delta E + P\Delta V$.
- vi) A salt is soluble in water when the concentration is
- a) 0.1 mole/lit. b) 0.2 mole/lit.
- c) 0.3 mole/lit. d) 0.5 mole/lit.
- vii) The ionic solutes dissolve in
- a) non-polar solvent
- b) polar solvent
- c) ionic solvent
- d) organic solvent.



viii) The viscosity of water at 10°C is

- a) 1.308 poise b) 1.307 poise
c) 1.306 poise d) 1.305 poise.

ix) At 15°C the viscosity of air is

- a) 17.8 Pa-s b) 17.6 Pa-s
c) 17.7 Pa-s d) 17.5 Pa-s.

x) The hybridization of carbon atoms in a benzene ring is

- a) sp b) sp^2
c) sp^3 d) sp^3d .

xi) The bond angle H-O-H bond in water molecule is

- a) 109.5° b) 107.3°
c) 105° d) 100°.

xii) Cresols on distillation with zinc dust gives

- a) *o*-xylene
b) *o*-xylene and *p*-xylene
c) benzene
d) toluene.



GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following. $3 \times 5 = 15$

2. Write a proper explanatory note on Markownikov and Anti-Markownikov rules.
3. Write down Sulphonation of alkanes with example.
4. Write a short note on radius ratio rule and its limitations.
5. Explain Born-Haber cycle to calculate lattice energy.
6. What is solubility and solubility rule ?

GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following. $3 \times 15 = 45$

7. a) Write in detail, about halogenation and nitration of aromatic ring.
- b) Describe Friedel-Craft alkylation and acylation.
- c) What is aromatic electrophilic substitution ?

$(3 + 3) + 5 + 4$



8. a) Define polymerization.
- b) Write down the various reaction of alkenes.
- c) Describe the stability of alkanes.
- d) What is Ozonolysis ? Write about hydration on alkynes.

2 + 4 + 4 + (2 + 3)

9. a) Write down a short note on solubility of ionic compound
in water.

- b) Write down a short note on different types of factor of
solubility.

6 + 9

10. a) Write down a short note on solution intermolecular
forces.

- b) Describe the solubility according to the polarity. 10 + 5



11. Define electron affinity, ionization potential and lattice energy. Describe the VSEPR theory and explain the molecular shape of SO_2 and SO_3 . Give an account on hydrogen bonding and its effect on physical and chemical properties.

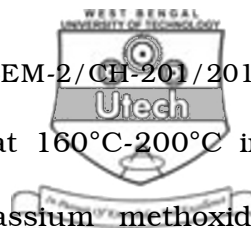
3 + 7 + 5

12. What happens when (answer Question No. (v) and any six from the rest)

3 + (2 × 6)

- i) Ethereal solution of methyl bromide and ethyl bromide are treated with sodium ?
- ii) Acetylene is passed through a heated tube ?
- iii) *n*-butane is heated with aluminium chloride at 300°C in presence of trace amount of water and alkene ?
- iv) Isobutene glycol oxidizes by acid dichromate or acid permanganate ?
- v) 1,2,3-tribromopropane is heated with solid potassium hydroxide and the resulting compound is treated with zinc dust in methanol solution ?

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vi) Acetylene is passed into methanol at 160°C - 200°C in presence of small amount of potassium methoxide under pressure ?

vii) Mixture of sodium salt of propionic acid and sodalime are heated ?

viii) Butadiene is treated with bromine (one molecule) ?

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