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Name :	A/
Roll No.:	To the control of Exercising and Explained
Invigilator's Signature :	

CS/B.Sc (H)/BT/GEN/Micro. Bio./Mol. Bio./SEM-2/CH-201/2013 ${\bf 2013} \\ {\bf CHEMISTRY}$

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: $10 \times 1 = 10$
 - i) Halogenation of alkanes occurs through
 - a) Radical
 - b) Carbene
 - c) Carbocation
 - d) Carbanion.
 - ii) Hydration of alkenes gives
 - a) Aldehyde
- b) Alcohol

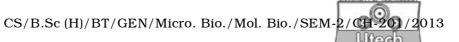
c) Acid

d) Amine.

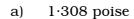
2708 [Turn over



- 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) $PV^{\gamma} = constant$ 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



b) 1.307 poise

d) 1.305 poise.

ix) At 15°C the viscosity of air is

a) 17·8 Pa-s

b) 17.6 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.



- 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)

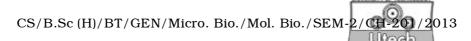
Answer any *three* of the following.

 $3 \times 15 = 45$

- 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

2708 4



8. a) Define polymerization.



- 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
 2708
 5 [Turn over

- 11. Define electron affinity, ionization potential and lattice energy. Describe the VSEPR theory and explain the molecular shape of ${\rm SO}_2$ and ${\rm SO}_3$. 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) $3 + (2 \times 6)$
 - 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?

2708 6

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- vi) Acetylene is passed into methanol at $160^{\circ}\text{C-}200^{\circ}\text{C}$ 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)?

2708 7 [Turn over