Gurudas College
B.Sc. Part-I (1+1+1 System) Internal Examination 2020
CHEMISTRY (HONOURS)
Paper-I

Time: 2 Hrs. **Full Marks: 50**

Group−A (Organic chemistry)

Answer any five questions : 5x5 = 25

1. Draw the conformational energy profile diagram for rotation around C 2 −C 3 bond of n-butane with proper labelling.

2. How will you carry out the resolution of a racemic alcohol? Outline the reaction step.

3. Define center of symmetry and diastereoisomer with example.

4. Draw as directed:

(i) (S)-3-Bromopentane-1-ol (in Flying Wedge)

(ii) (R)-2-Methyl pentane-1-ol (Fischer projection)

5. EtSCH 2 CH 2 Cl is found to undergo hydrolysis 10 4 times faster than EtOCH 2 CH 2 Cl under comparable condition, explain.

6. Why polarizability of O−H bond in phenol is higher than the O−H bond of methyl alcohol?

7. What is meant by primary kinetic isotope effect? Explain with an example?

8. Salicylic acid is much stronger acid than para-hydroxy benzoic acid-explain.

Group B (Physical Chemistry)

Answer any 5 questions (5x5=25)

1) Write down ‘Zeroth law of thermodynamics’, with an example.
2) Define ‘Isolated system’ and ‘Open system’, with example.
3) Write down the mathematical expression of enthalpy, clearly mentioning the meaning of terms involved in it.
4) What is ‘Hesse’s law of constant heat summation’? Explain with example.
5) The heat of combustion of liquid Ethanol into CO_2 and liquid water is -327 KCal, at constant pressure. Calculate q_v (Temp.= 27^oC).
6) Starting from the Maxwell’s speed distribution in 3D show that the most probable speed of gas molecules is a function of temperature of the gas.
7) What is ‘homogenous catalysis’? Give an example.
8) Draw the rate versus time profile for (i) a zero order reaction (ii) first order reaction.
9) Explain how the internal energy of a triatomic non-linear molecule is partitioned according to the equipartition of energy principle.