Univ. Roll No:-.....

GLA University, Mathura

Course:- B.Tech. I-Year. I-Mid Term (Odd Sem.)Examination, 2013-14

Subject:- Engineering Chemistry (AHC - 101)

Time:- 90Minutes **M.M:- 20**

Notes:-

1. Answer **ANY FOUR** questions from each section.
2. All questions of the particular section should be answered collectively at one place.
3. Answer should be to – the point and wherever required, be supplemented with neat sketches.
4. Any missing data may be assumed suitably giving proper justification.
5. Figure on the right-hand side margin indicate marks.

Section – A (Attempt any four questions) (04 × 01 = 04)

Ques.1. The half life time of a reaction is halved as the initial concentration of the reactant is doubled, find the order of the reaction.

Ques.2. Draw the anti or staggered conformation of n-butane.

Ques.3. $2C_6H_5CHO \xrightarrow{OH^-} A + B$

Write down the products of the above reaction.

Ques.4. Why CH_3OCH_3 is more soluble in water than CH_3SCH_3 .

Ques.5. Calculate the bond order of N_2 molecule.

Ques.6. Length of the unit edge of a body centered cubic metal crystal is 352 pm. Calculate the radius of an atom of the metal.

Section – B (Attempt any four questions) (04 × 1.5 = 06)

Ques.1. Arrange, NO, NO^+, NO^- and NO^{2-} in increasing order of their bond length.

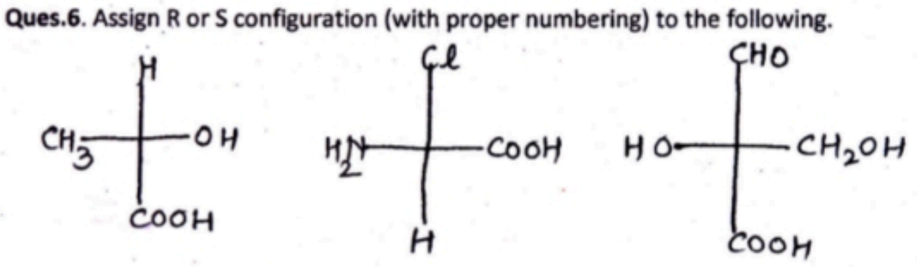
Ques.2. Explain first order reaction with suitable examples.

Ques.3. Explain why Ne_2^+ exists but Ne_2 does not.

Ques.4. Sodium chloride crystal has FCC structure. Its density is 2.163×10^3 kg m^{-3}. Calculate the edge of the unit cell cube.

Ques.5. The rate of a reaction triples when temperature changes from 20^0 to 50^0C. Calculate the energy of activation for such a reaction.

Ques.6. Assign R or S configuration (with proper numbering) to the following.



Section – C (Attempt any four questions) (04 × 2.5 = 10)

Ques.1. Draw the energy level diagram of O_2. Calculate its bond order and assign magnetic character.

Ques.2. Write the mechanism of aldol condensation taking suitable example.

Ques.3. Derive the integrated rate law for second order reaction when both the reactants are same.

Ques.4. The following data was obtained on hydrolysis of ethyl acetate at 25°C in hydrochloric acid. Establish that it is a first order reaction.

Time in minute	0	75	119	183	∞
Volume of alkali used(ml)	9.62	12.10	13.10	14.75	21.05

Ques.5. Discuss meso compound and racemic mixture with examples.

Ques.6. Describe the production of gobar-gas with a neat diagram.