25/5/15

Printed Pages-3

University Roll No.....

B. Tech. I Year, II Semester, I Term Examination, 2014-15

AHC-101: Engineering Chemistry

Time: 01 ½ Hours

Total Marks: 20

## Section-A

**Note: Attempt All Questions.** **[1X05=05 marks]**

I. For a certain reaction, A $\longrightarrow$ P, a plot of ln [A] versus t gives a straight line with a slope of $-1.24\ s^{-1}$. Find the order of the reaction ?

II. Explain, why *p*- nitrophenol is more soluble than *o*-nitrophenol in water.

III. Allyl halides react faster in nucleophilic substitution reactions as compared to primary alkyl halides. Why ?

IV. Write molecular orbital electronic configuration of HF molecule.

V. What are functional materials ? Give any two examples of organic functional materials.

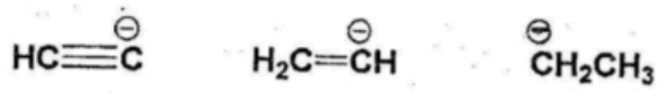
## Section-B

**Note: Attempt Any Three Questions.** **[2X03=06 marks]**

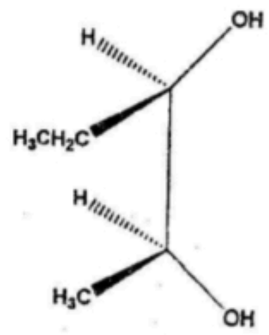
I . For the second order reaction of base catalyzed hydrolysis of ester at $35^0$ C, k =$6.81\times 10^{-3}$ L $mol^{-1}sec^{-1}$calculate the time required for the hydrolysis of 70% ester, if the initial concentration of reactants in the reaction mixture are 0.05 M ester and 0.1 M NaOH.

II. Differentiate piezoelectric and reverse piezoelectric effects with examples.

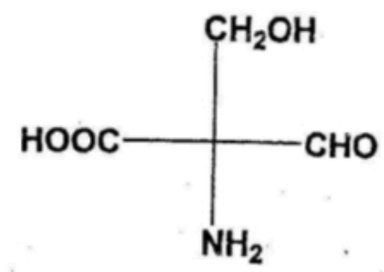
III. Arrange following carbanions in order of increasing stability by giving proper explanation.



IV. Allocate ( R )- /(S)- or (E)- /(Z)- configuration to the following molecules- (by giving proper numbering.)



(a)



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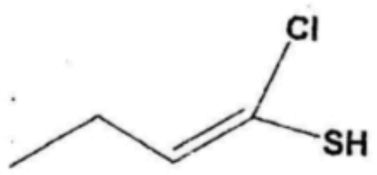
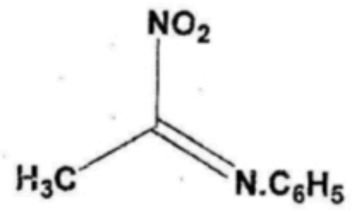


(c)



(d)

## Section-C

**Note: Attempt Any Three Questions.** **[3X 03=09 marks]**

I.(a) Derive an integrated rate equation for a Second order reaction, when both reactants are same.

(b).Calculate activation energy of the reaction, whose rate constant is quadrupled by $10^{o}$ rise in temperature in the vicinity of $28^{o}$ C.



II. Draw the molecular orbital diagram, calculate bond order and assign magnetic behaviour to $F_2$ molecule.

III. Discuss the stability of conformers of *n*-butane by giving suaitable energy level diagram.

IV. What are bio-materials ? Write their important characteristics with some applications.