



Previous Year Solved Question Paper  
of

**G.A.T.E. (XL) 2011**

**LIFE SCIENCES**

**XL: Chemistry**

**Examination**

*(Original Question Paper with Answer Key)*

**GRADUATE APTITUDE TEST IN ENGINEERING**



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## H : CHEMISTRY (Compulsory)

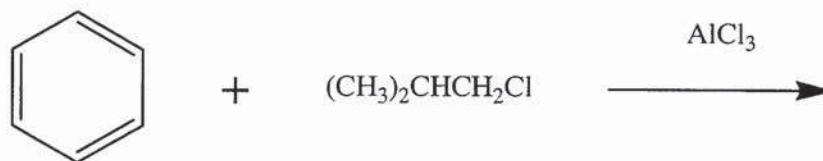
**Q. 1 – Q. 5 carry one mark each.**

Q.1 Electrophile among the following is

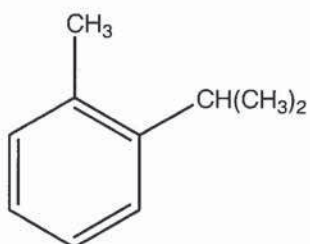
- (A)  $\text{NH}_3$                       (B)  $\text{SO}_3$                       (C)  $\text{NO}_2$                       (D)  $\text{CH}\equiv\text{C}^-$

B

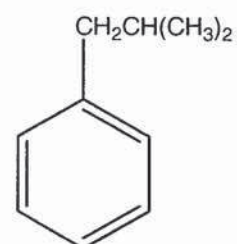
Q.2 The major product for the following reaction is



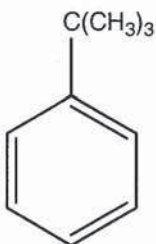
(A)



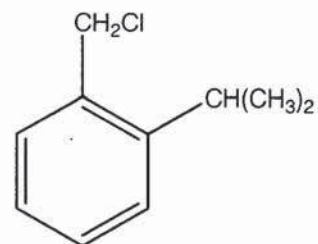
(B)



(C)



(D)



C

Q.3 Trouton's rule is obeyed by

- (A) hydrogen                      (B) methanol                      (C) benzene                      (D) acetic acid

C

Q.4 Which one of the following compounds is known as silanes?

- (A) Silicon hydrides  
 (B) Silicon halides  
 (C) Silicon hydroxides  
 (D) Silicon oxides

A

Q.5 The shape of  $\text{PCl}_5$  is

- (A) tetrahedral                      (B) square planar  
 (C) trigonal bipyramidal                      (D) square pyramidal

C

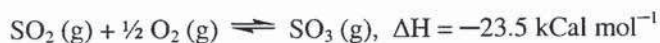
**Q. 6 - Q. 15 carry two marks each.**

Q.6 The correct order of acidity is

- (A)  $C_6H_5COOH < CH_3COOH < C_6H_5OH < C_2H_5OH$   
 (B)  $CH_3COOH < C_6H_5COOH < C_2H_5OH < C_6H_5OH$   
 (C)  $C_2H_5OH < C_6H_5OH < C_6H_5COOH < CH_3COOH$   
 (D)  $C_2H_5OH < C_6H_5OH < CH_3COOH < C_6H_5COOH$

D

Q.7 Consider the following equilibrium



The formation of  $SO_3$  is favoured by

- (A) compression and decreasing the temperature  
 (B) compression and increasing the temperature  
 (C) expansion and increasing the temperature  
 (D) expansion and decreasing the temperature

A

Q.8 A molecular electronic excited state has a life time of  $10^{-9}$  s, the uncertainty in measuring the frequency (Hz) of the electronic transition is approximately

- (A)  $\frac{h}{4\pi} \times 10^9$       (B)  $\frac{h}{4\pi} \times 10^{-9}$       (C)  $\frac{1}{4\pi} \times 10^{-9}$       (D)  $\frac{1}{4\pi} \times 10^9$

D

Q.9 According to the molecular orbital theory, bond order for  $H_2^+$  species is

- (A) 0.5      (B) 1.0      (C) 1.5      (D) 2.0

A

Q.10 According to crystal field theory, the electronic configuration of  $[Ti(H_2O)_6]^{3+}$  in the ground state is

- (A)  $e^1 t_2^0$       (B)  $t_{2g}^0 e_g^1$       (C)  $e^0 t_2^1$       (D)  $t_{2g}^1 e_g^0$

D

Q.11 The ions with lowest and highest radii among  $O^{2-}$ ,  $F^-$ ,  $Na^+$  and  $Mg^{2+}$  are respectively,

- (A)  $Mg^{2+}$  and  $O^{2-}$       (B)  $O^{2-}$  and  $F^-$   
 (C)  $O^{2-}$  and  $Mg^{2+}$       (D)  $Na^+$  and  $Mg^{2+}$

A

**Common Data Questions****Common Data for Questions 12 and 13:**

The solubility products of FeS, ZnS, CuS and HgS are  $1.0 \times 10^{-19}$ ,  $4.5 \times 10^{-24}$ ,  $4.0 \times 10^{-38}$  and  $3.0 \times 10^{-53}$  respectively.

Q.12  $H_2S$  is passed through an aqueous solution containing all the four metal ions. The metal ion that precipitates first is

- (A)  $Fe^{2+}$       (B)  $Zn^{2+}$       (C)  $Cu^{2+}$       (D)  $Hg^{2+}$

D

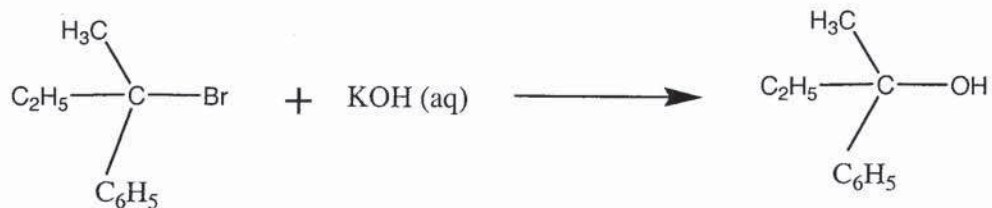
Q.13 The concentration of  $S^{2-}$ , at which FeS begins to precipitate from the mixture having 0.1 M  $Fe^{2+}$  is

- (A)  $1.0 \times 10^{-17}$  M      (B)  $1.0 \times 10^{-18}$  M      (C)  $1.0 \times 10^{-19}$  M      (D)  $1.0 \times 10^{-20}$  M

B

**Linked Answer Questions****Statement for Linked Answer Questions 14 and 15:**

Consider the reaction



Q.14 The above reaction is an example of

- (A) addition reaction  
(B) bimolecular elimination reaction (E<sub>2</sub>)  
(C) unimolecular substitution reaction (S<sub>N</sub>1)  
(D) bimolecular substitution reaction (S<sub>N</sub>2)

**C**

Q.15 If the concentration of KOH in the reaction mixture is doubled, the rate of the reaction will be

- (A) decreased to one-half  
(B) the same  
(C) increased by two-times  
(D) increased by four-times

**B****END OF SECTION - H**

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