

Sample Paper

QUAID-I-AZAM UNIVERSITY
DEPARTMENT OF CHEMISTRY

Aptitude test for admission to M.Sc. Chemistry

Name: _____ Registration No. _____

Father's Name: _____ Signature: _____

Note:- Time duration is one hour and questions will be set accordingly.

Encircle the correct option

Q.1 An electron volt (eV) is the energy required to move an electronic charge (e) through an electric potential of 1V. Estimated 2eV energy in kJ.mol^{-2} of electronics will be equal to _____.

- a) 94.46 b) 193
c) 0.193 d) 193.10^3

Q.2 At constant volume and temperature the criterion of spontaneity is:

- a) $\Delta G > 0$ b) $\Delta A < 0$
c) $\Delta A > 0$ d) $\Delta G < 0$

Q.3 Unit of specific conductance in the SI system is:

- a) $\Omega \text{ m}^{-1}$ b) N m^{-1}
c) S m^{-1} d) S m^{-2}

Q.4 For the equation $(3/2)x + 2/5 = 1$, x should be:

- a) $2/5$ b) $-2/3$
c) 1 d) none of the above

Q.5 The derivative of $f(x) = 5/x^3$ is _____.

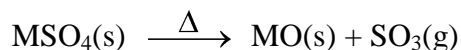
- a) $-15 x^3$ b) $-15 x^4$
c) $-15 x^2$ d) $-15 x^{-4}$

Q.6 What will be the pH of the solution when 24.0 mL of 0.50M HCl is added to 40.0 mL of 0.20M NH_3 ? $\text{HCl} + \text{NH}_3 \longrightarrow \text{NH}_4\text{Cl}$

- a) 1.0 b) 4.20 c) 1.20 d) 0.52

Contd.....P/2

Q.7 Predict the order of decomposition temperature of alkaline earth metal sulphates in the reaction:



- a) $\text{MgSO}_4 < \text{CaSO}_4 < \text{SrSO}_4 < \text{BaSO}_4$
- b) $\text{CaSO}_4 < \text{BaSO}_4 < \text{SrSO}_4 < \text{MgSO}_4$
- c) $\text{MgSO}_4 < \text{BaSO}_4 < \text{CaSO}_4 < \text{SrSO}_4$
- d) $\text{BaSO}_4 < \text{MgSO}_4 < \text{CaSO}_4 < \text{PbSO}_4$

Q.8 What shape would you expect for the species IF_5 ?

- a) Trigonal planar
- b) Trigonal bipyramidal
- c) Square pyramidal
- d) None of the above

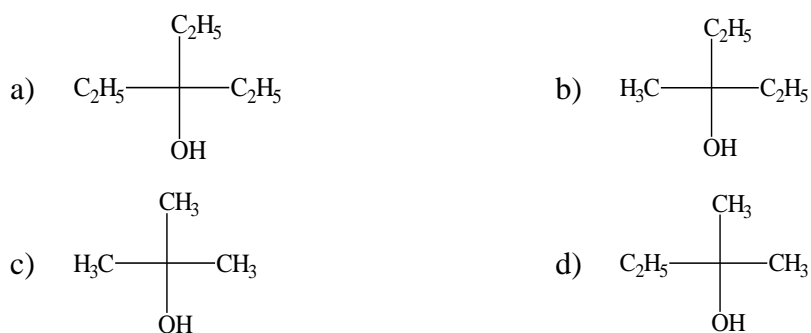
Q.9 The solubility product of $\text{Mg}(\text{OH})_2$ is 5.0×10^{-12} . The solubility of $\text{Mg}(\text{OH})_2$ in water is _____ mol/L.

- a) 2.0×10^{-5}
- b) 1.08×10^{-4}
- c) 3.0×10^{-3}
- d) 1.1×10^{-2}

Q.10 Which of the following has the highest Lattice Energy?

- a) NaF
- b) CuBr_2
- c) MgO
- d) AgCl

Q.11 Ethyl acetate on reaction with ethyl magnesium bromide followed by acid hydrolysis gives:



Q.12 The relationship of the following two structures is:



- a) Epimers
- b) Geometric isomers
- c) Metamers
- d) Conformational isomers
