

**CHEMISTRY**  
**QUESTION SET-4**

1. The compound formed as a result of oxidation of ethyl benzene by  $\text{KMnO}_4$  is

- a) methylamine                                      b) trimethylamine  
c) aniline    d) dimethylamine

2. Which of the following species exhibits the diamagnetic behavior?

- a) NO    b)  $\text{O}_2^{2-}$   
c)  $\text{O}_2^+$     d)  $\text{O}_2$

3. The first and second dissociation constants of an acid  $\text{H}_2\text{A}$  are  $1.0 \times 10^{-5}$  and  $5.0 \times 10^{-10}$  respectively. The overall dissociation constant of the acid will be

- a)  $0.2 \times 10^{-5}$     b)  $5.0 \times 10^{-5}$   
c)  $5.0 \times 10^{-15}$     d)  $5.0 \times 10^{-15}$

4. Consider the reaction  $2\text{A} + \text{B} \rightarrow \text{Products}$ . When concentration of B alone was doubled, the half life did not change. When the concentration of A alone was doubled, the rate increased by two times. The unit of rate constant for this reaction is

- a)  $\text{s}^{-1}$     b)  $\text{Lmol}^{-1}\text{s}^{-1}$   
c) no unit    d)  $\text{mol L}^{-1}\text{s}^{-1}$

5. Which of the following has a square planar geometry?

- a)  $[\text{PtCl}_4]^{2-}$     b)  $[\text{CoCl}_4]^{2-}$   
c)  $[\text{FeCl}_4]^{2-}$     d)  $[\text{NiCl}_4]^{2-}$

6. The secondary structure of a protein refers to

- a) fixed configuration of the poly peptide backbone  
b)  $\alpha$ -helical backbone  
c) hydrophobic interaction  
d) sequence of  $\alpha$ -amino acids

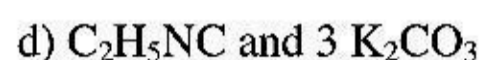
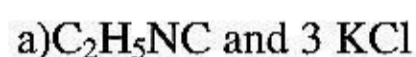
7. Which of the following reactions will yield 2,2-dibromopropane?

- a)  $\text{CH}_3\text{-CH}=\text{CH}_2 + \text{HBr} \rightarrow$



8. In a chemical reaction,

$\text{CH}_3\text{CH}_2\text{NH}_2 + \text{CHCl}_3 + 3\text{KOH} \rightarrow (\text{A}) + (\text{B}) + \text{H}_2\text{O}$ , the compound (A) and (B) are respectively



9. Presence of a nitro group in a benzene ring

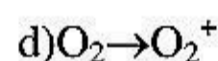
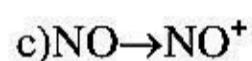
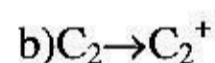
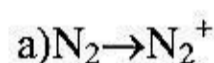
a) deactivates the ring towards electrophilic substitution

b) activates the ring towards electrophilic substitution

c) renders the ring basic

d) deactivates the ring towards nucleophilic substitution

10. In which of the following ionization processes, the bond order has increased and the magnetic behavior has changed?



11. The actinoids exhibit more number of oxidation states in general than the lanthanoids. This is because

a) the 5f orbital extend further from the nucleus than 4f orbital

b) the 5f orbital are more buried than 4f orbital

c) there is similarity between 4f and 5f orbitals in their angular part of the wave function

d) the actinoids are more reactive than the lanthanoids

12. Which of the following solutions will have the lowest freezing point?

a) 1% aqueous solution of sodium chloride

b) 1% aqueous solution of methyl alcohol

c) 1% aqueous solution of fructose

d) 1% aqueous solution of alcohol

**13.**Regular use of the following fertilizers increases the acidity of soil

- a) ammonium sulphate                      b) potassium nitrate  
c) urea    d) superphosphate of lime

**14.**Identify the correct statement regarding a spontaneous process,

- a) Lowering of energy in the reaction process is the only criterion for spontaneity  
b) For spontaneous process in an isolated system  
c) Endothermic processes are never spontaneous  
d) Exothermic processes are always spontaneous

**15.**Which of the following nuclear reaction will generate an isotope

- a)  $\beta$ -particle emission  
b) neutron particle emission  
c) positron emission  
d)  $\alpha$ -particle emission

**16.**The weight of calcium hydroxide in 100 ml of 0.01 molar solution will be

- a) 36.5g    b) 0.148g  
c) 0.074g    d) 2.5g

**17.**Which of the following has the minimum boiling point?

- a) n-butane    b) 1-butyne  
c) 1-butene    d) isobutene

**18.**Which of the following will have a meso-isomer also?

- a) 2-chlorobutane    b) 2,3-dichlorobutane  
c) acetonitrile    d) acetamide

**19.** The compound formed on heating chlorobenzene with chloral in the presence of concentrated sulphuric acid is

a) gammexene

b) DDT

c) Freon

d) hexachloroethane

**20.** Which of the following is reduced with zinc and hydrochloric acid to give the corresponding hydrocarbon

a) ethyl acetate

b) acetic acid

c) acetamide

d) butan-2-one

