MCQ Discussion

1. A process is carried out at constant volume and at constant entropy. It will be spontaneous if:
a) $\Delta H < 0$
b) $\Delta U < 0$
c) $\Delta A < 0$
d) $\Delta G < 0$

2. The standard electrode potentials (E^o) for Fe3+/F2+ and Fe2+/Fe electrodes are + 0.77V and - 0.44 V respectively at 300 K. The E^o of Fe3+/Fe electrode at the same temperature is
a) – 0.11 V
b) 1.21 V
c) 0.33 V
d) – 0.04 V
3. One mole of an ideal gas expands against a constant external pressure of 1 atm from a volume of 10 dm3 to a volume of 30 dm3. Calculate work done by the gas in joules.
a) 3026 J
b) 2026 J
c)-3026 J
d) -2026J
4. Which of the following metal ions prefer to form sulphides?
a) Ca2+ and Al3+
b) Ag+ and Hg2+
c) Ca2+ and Ag+
d) Al3+ and Hg2+

5. The reactivity order of alkyl halides in SN2 is

a) $CH_3X > 1^0 > 2^0 > 3^0$, b) $CH_3X > 2^0 > 1^0 > 3^0$, c) CH3 $X > 3^0 > 1^0 > 2^0$ d) $CH_3X > 3^0 > 2^0 > 1^0$

6. Arrange the following in the decreasing order of leaving group in nucleophilic substitution reaction.

a) H– > Cl– > HO– > Br– > CH3COO–, b) Cl– > Br– > HO– > H– > CH3COO–

c) Cl– > Br– > CH3COO – > HO– > H–, d) HO– > CH3COO – > H– > Br– > Cl–

7. The energy required to rotate n-butane molecule about the carbon-carbon bond is called _____

a) Rotational energy

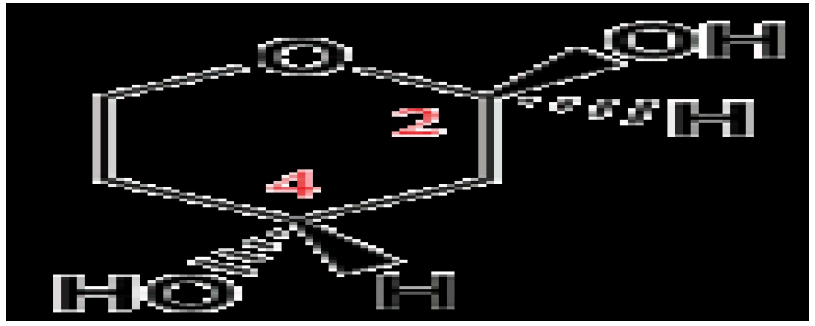
b) Torsional energy

c) Enantiomeric energy

d) Potential energy

8. Which is the correct assignment of chirality at C2 and C4 of the following molecule?

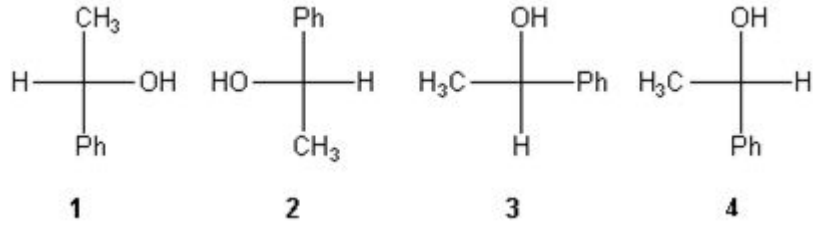
a) 2S,4S b) 2R,4R c) 2S,4R d) 2R,4S



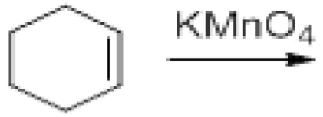
9. Which of the following is an alkane which can exhibit optical activity?

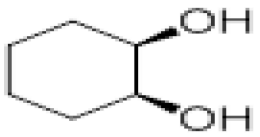
a) Neopentane b) Isopentane c) 3–Methylpentane **d) 3–Methylhexane**

10. Which of the following Fischer projections is different from the other three?

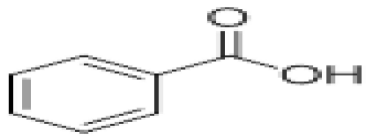


11. Predict the product in the following reaction oxidized by $KMnO_4$:



- 

$CH_3(CH_2)_6CO_2H$



Fe3+ Fe 2+ Fe

$nE_{Fe3+/Fe} = n1\ E_{Fe3+/Fe2+} + n_2\ E_{Fe2+/Fe}$

3 x E = 1 x (0.77) + 2 (-0.44)

3E = 0.77-0.88

3E = -0.11

E = -0.11/3 = -0.037