

Seat No -

178
PET-2012

Con. 2961-12.

(3 Hours)

KK-2693

[Total Marks : 100

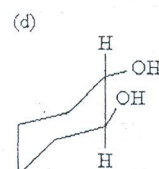
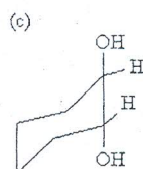
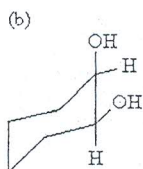
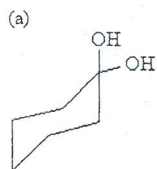
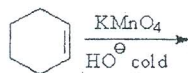
- N.B.** 1) All questions are **compulsory**.
2) Figures to the **right** indicate **full** marks.
3) Use of logarithmic table/non programmable calculator is **allowed**.

Q.1 Select the most appropriate choice for the following: **40**

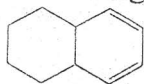
- A)** The primary salt effect is represented by
a) $\ln K = \ln K_0 + 2.02 Z_A Z_B I$
b) $\ln K = Z_A Z_B \sqrt{I}$
c) $\ln K = Z_A Z_B I$
d) $\ln K = \ln K_0 + 1.02 Z_A Z_B \sqrt{I}$
- B)** The eigen functions are orthogonal when
a) $\int \Psi_n^* \Psi_m d\tau = 0$
b) $\int \Psi_n^* \Psi_m d\tau = 1$
c) $\int \Psi_n^* \Psi_m d\tau = 2$
d) $\int \Psi_n^* \Psi_m d\tau = 3$
- C)** The third law of thermodynamics states that in the limit $T \rightarrow 0$
a) $\Delta G = 0$ b) $\Delta H = 0$ c) $\Delta U = 0$ d) $\Delta S = 0$.
- D)** Reduced phase rule equation for a two components system becomes
a) $F = 4 - P$ b) $F = 3 - P$ c) $P = F - 3$ d) $P = F - 4$
- E)** The Debye-Falkenhagen effect is
a) conductance under high potential gradient
b) conductance under high resistance
c) conductance under high A.C. frequencies
d) conductance under high D.C. frequencies
- F)** sp^3d hybridisation occurs in PCl_5 but not in PH_5 . This could be because
a) Cl^- is more reactive than H^-
b) Cl has 'd' orbitals but H does not
c) Cl atom is larger than H atom
d) Due to the higher electronegativity of Cl, the 'd' orbital of phosphorous expands

TURN OVER

- G) The point groups for the molecules H_3^+ , H_3 , H_2O , BeCl_2 respectively, are
- D_{3h} , $D_{\infty h}$, C_{2v} , $D_{\infty h}$
 - D_{3h} , C_{2v} , C_{2v} , $C_{\infty v}$
 - $C_{\infty h}$, C_{2v} , C_{2v} , D_{3h}
 - $C_{\infty v}$, C_{2v} , C_{2v} , $C_{\infty v}$
- H) The lone pair of electrons becomes an inert pair of electrons in the following order for NH_3 , AsH_3 , SbH_3 , BiH_3
- $\text{NH}_3 > \text{AsH}_3 > \text{SbH}_3 > \text{BiH}_3$
 - $\text{NH}_3 > \text{BiH}_3 > \text{SbH}_3 > \text{AsH}_3$
 - $\text{NH}_3 > \text{SbH}_3 > \text{BiH}_3 > \text{AsH}_3$
 - $\text{NH}_3 > \text{BiH}_3 > \text{AsH}_3 > \text{SbH}_3$
- I) In case of Mg^{2+} and Ca^{2+} , the former
- is found concentrated in the inside of an animal cell
 - is found concentrated in the outside of an animal cell
 - is not found in an animal cell
 - is found only in plant cells
- J) If a complex is formed in stepwise manner, then for the stepwise stability constants pK_1 and pK_2 , the following stability relation holds
- $pK_1 = pK_2$
 - $pK_1 > pK_2$
 - $pK_1 < pK_2$
 - $pK_1 \geq pK_2$
- K) What is the major product expected from the following reaction?

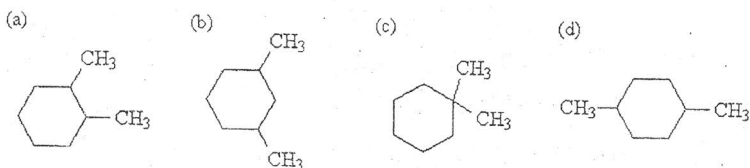


L) What is the λ_{max} for the following compound?



- a) 234 nm b) 244 nm c) 273 nm d) 280 nm

M) The CMR spectrum of an unknown compound shows 4 absorptions and the PMR spectrum shows 4 absorptions. Which of the following compounds is the unknown compound?



N) Which of the following compounds is the best Brønsted base?

