VCD - 16/11/19

Time - 3 Hours **Marks -100**

NOTE: i) All the questions are compulsory.
ii) Figures to right indicate full marks.
iii) Use of non –programmable calculator / log table is allowed.

Q.1 A. Select the correct option. **(12)**

I) The velocity at which the fraction of molecule is maximum is called _____.
a) maximum velocity b) minimum velocity c) most probable velocity

II) The velocity possessed by the maximum number of molecules in the gas is known as _____
a) average velocity b) most probable velocity c) root mean square velocity

III) Entropy of gas is _____ than solid.
a) greater b) lower c) equal

IV) The unit of Kp is _____.
a) atm b) mol L c) mol

V) Chlorine gas is _____ in colour.

a) greenish-yellow b) black c) red.

VI) Molecule or ion can behave both as bronsted acid and base are _____.

a) monoprotic b) polyprotic c) amphiprotic

VII) When _____ is added to the solution of Cl^- ion which gives white precipitate.

a) $AgNO_3$ b) AgBr c) NaCl

VIII) NO_3 gas is _____ in color.

a) black b) brown c) white.

IX) More polar solvents favour _____reaction.

a) E_1 b) E_2 c) E_{1cB}.

X) Diels alder reaction is an example of _____reaction.

a) addition b) cyclo addition c) substitution.

XI) Sp hybridised carbon is more _____than sp^2 and sp^3 hybridised carbon atom.

a) acidic b) basic c) neutral.

XII) Catalytic hydrogenation of alkene is _____ addition.

a) cis b) trans c) anti.

B. State whether following statements are true or false. **(03)**

I) Distance travelled by the molecule before collision is called free path.

II) The presence of equilibrium constant of a reaction depends on presence of catalyst.

III) The end point acid base depend on pH.

C. Match the following column. (any five) **(05)**

I) Avogadro law	1,2-glycols
II) Gibbs free energy	Base
III) Hydrixylation of alkens with OsO_4	State functions
IV) N^{-3}	Irritating odour
V) Diels alder reaction	V α n
VI) Ammonia gas	Acid
	Conjugated diene
	Alkane

Q2. Answer any four of the following. **[20]**

A. What is meant by an ideal gas and real gas?

B. Explain the deviation of gases from ideal behaviour?

C. Derived vanderwaals equation.

D. Using ideal gas equation and vanderwaal equation, calculate the pressure exerted by 12.0 g of CO_2 occupied in 1.6 dm^3 at 298K.

Given:R=8.314$NmK^{-1}mol^{-1}$, a=0.3640Nm^4mol^{-2}, b=4.267×$10^{-5}m^3$/mol, mass of CO_2=44

E. State Le-chartelier principle. How does it explain the effects of change of variables on the equilibrium.

F. Calculate the value of standard free energy change and equilibrium constant for the following reaction.

$N_2O_4 \leftrightarrow 2NO_2$ Given : $G^0(N_2O_4) = 97.8kJ$ and $G^0(NO_2) = 51.3kJ$.

Q3. Answer any four of the following. [20]

A. Explain the terms qualitative analysis and quantitative analysis.

B. What are dry test and wet test explain.

C. Name the various types of qualitative analysis.

D. Explain classification of substance of acid and bases of solvent system

E. What are different types of Lewis acids and bases? Explain with suitable examples.

F. What are the limitations of bronsted lowry theory?

Q4. Answer any four of the following. [20]

A. What are elimination reactions. Explain giving example.

B. What is dehydration. Explain giving example.

C. What is Markonikov's Rule? Explain with an suitable example.

D. I) How does acetylene convert into following compound?

a) acetaldehyde b) Vinyl chloride.

II) Give ozonolysis product of 2-methyl propane.

E. Explain the mechanism of hydroboration oxidation of alkane with suitable examples.

F. Explain the mechanisms of E_2-elimination reaction with energy profile diagram.

Q5. Answer any four of the following.

A. Explain acidic nature of acetylene.

B. Explain the deviation shown by real gas from Boyle's law

C. what are dry test and wet teats for cations?

D. Give the advantage of lowry bronsted theory.

E. Write the reaction for the action of N-bromosuccinimide on methyl benzene with mechanism.

F. Give reaction for the following,

I) action of alcoholic KOH on 2- bromo butane.

II) stepwise addition of HCL to acetylene.