

①

Set I
00065164

Page No. 01/08

Q. No.	Answers	Marks
Q 1	<p>A) i] C 22.4 dm^3 ii] C Entropy iii] C $PV = nRT$</p> <p>iv] C 44 g v] B $K_p = 2 \frac{K_c}{RT}$ vi] B Increases</p> <p>vii] a acidic viii] a Reddish Brown ix] a anion</p> <p>x] a protophilic xi] b Cl^- xii] a Co^{3+}</p> <p>xiii] iso-propyl-bromide xiv] Carbocation xv] E_1-reaction</p> <p>xvi] Cyclo-addition xvii] acidic xviii] cis</p>	12
B)	<p>i] False ii] True iii] False</p> <p>iv] True v] Alkene-hydroxylation - KMnO_4 True vi] True.</p>	03
C)	<p>i] C $v \propto \frac{1}{P}$ ii] D $K_p = K_c$ iii] C $\text{K}_4\text{Fe}(\text{CN})_6$</p> <p>iv] B - toxic v] Alkene-hydroxylation - KMnO_4 vi] E_1 - first order reaction</p>	05

2

00065164

02/08

Q2

A) Define with explanation
Deviation for isothermal. (2m)
(3m)

B) pressure correction

$$P_i = P + P_n$$

$P_i \rightarrow$ ideal $P \rightarrow$ is observed pressure

$P_n \rightarrow$ pressure correction

$$P_n \propto d^2$$

$$d = n/v$$

$$\therefore P_n \propto n^2/v^2$$

$$(a) P_n = \frac{an^2}{v^2}$$

$$\therefore \left(P + \frac{an^2}{v^2} \right) (v-nb) = nRT$$

C) $Pv = nRT$

$$i) P = \frac{nRT}{v} = \frac{1 \times 8.314 \times 300}{30 \times 10^{-3}} = 83.14 \times 10^{-3} \text{ Nm}^{-2} \text{ (pm)}$$

$$ii) P = \frac{nRT}{v-nb} - \frac{an^2}{v^2} = \frac{1 \times 8.314 \times 300}{30 \times 10^{-3} - 1 \times 6.58 \times 10^{-5}} - \frac{0.5583 \times 10^{-3}}{(30 \times 10^{-3})^2} \text{ (3m)}$$

d) definition of each (1m) (2)

$K_p = K_c \cdot (RT)^{\Delta n}$ — relation (3m)

e) definition \rightarrow (1m)
Application w.r.t. $C, P, T, V,$ (1m) (4)

f) definition and explanation (2m)
 $\Delta G^0 = -2.303 RT \log K$
 $-103.25 \times 10^3 = -2.303 \times 8.314 \times 298 \log K$

3

00065164

set I

Questions should be —
WRITTEN IN LEGIBLE HANDWRITING IN BLACK INK.
SIGNS, SKETCHES OR FIGURES IF ANY BE DRAWN IN NEAT BLACK INK,
so as to avoid mistakes in the printed question papers.

Duration Hours.

Total Marks assigned to the paper

Q. No.		Marks
Q.3	<p style="text-align: center;">N.B. :</p> <p>Complex forming ability in qualitative analysis with one example.</p>	02
A]	<p>Phenomenon in which a metal ion combined with anion (Cl^-, Br^-) or Neutral NH_3 to form species which are more stable. Extra stability useful in detection of ions. eg. any one</p>	03.
B]	<p>What do you mean by qualitative analysis Define - Any four types each with one mark.</p>	02
C]	<p>starch iodide paper and lead acetate paper each $2\frac{1}{2}$ marks.</p>	$\frac{1}{2}$

9

set I 00065164

Page No... 04/08

Q. No.		Marks
Q3	D) Definitions, Examples, Reactions with explanation	2+3
	E) Pearson's principle —	1M
	Class a metals & ligands	1M
	Class b metal & ligands	1M
	Border line acid & bases, explanation	— 2M
	F) Lewis acid-Base — Advantages — 3	2½ M
	Limitation — 3	2½ M

Q.4 A] i] Wurtz-Fittig reaction! - statement - 1 m.

(5)

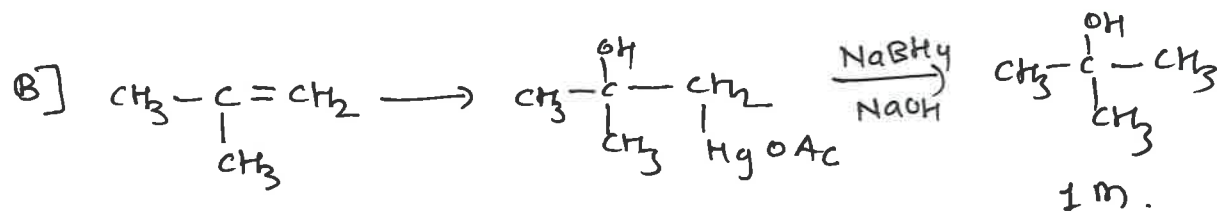
suitable reaction - 1 m

Explanation - 1 m

ii] Iodination of alkanes is difficult! -

Reaction - 1 mark

Reason - 1 mark



1 m.

1 m

Mechanism → 3 marks.

Mercury bridge carbocation - 1 m.

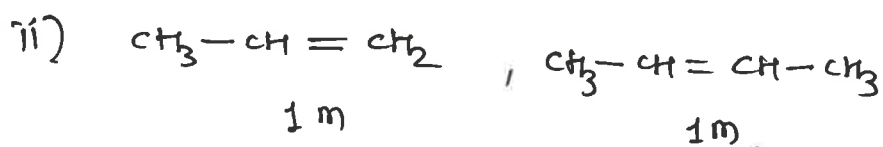
Mercuration - 1 m

Demercuration - 1 m

c] i] Hofmann elimination! - statement - 1 m

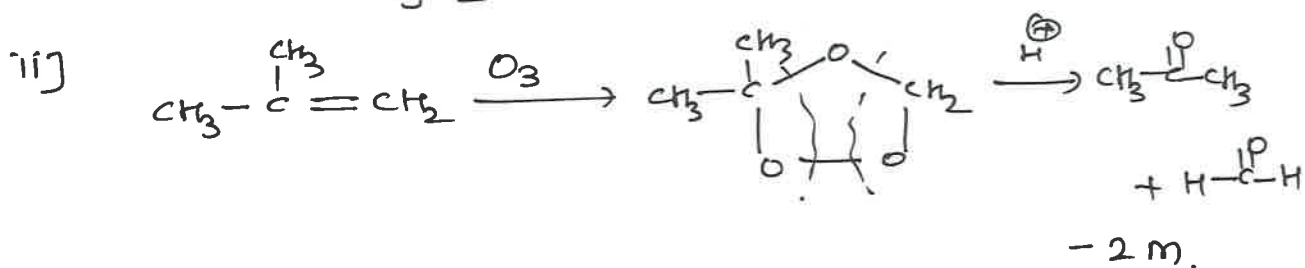
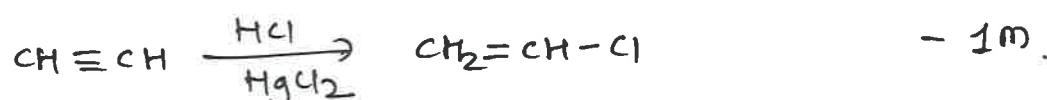
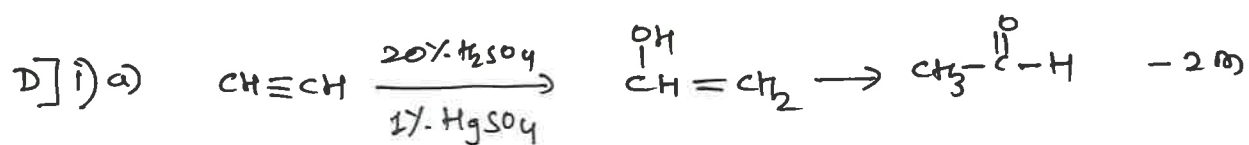
Example - 1 m

Explanation - 1 m



1 m

1 m.



- 2 m.

E] Mechanism of hydroboration-oxidation! -

Example Reaction - 1 m.

Mechanism - 3 m

Explanation - 1 m.

②

Page No.....

Q. No.

Q.5 c) calculate the solubility in pure water of silver chloride whose solubility product is 1.1×10^{-10} at 298 K.

eq²

problem solved.

$$s = 1.0488 \times 10^{-5} \text{ mol dm}^{-3}$$

A) definition with explanation
Any three significance of equilibrium constant.

B) Any five assumptions

Marks

① m.

② m.

with unit

①

2 m

3 m

5 m

7

00065164

07/08

Page No.....

Q. No.		Marks
Q 5 D)	① Acid-Base Titration - Neutralisation example	
	② Precipitation example	
	③ Redox - example	3M
	④ Complexometric, example	
	Explanation of indicators, pH	2M

8

Q. 5 E] Acetylide formation - 1 m
reaction

Acetylide to propyne - ~~1 m~~ $1\frac{1}{2}$ m

Acetylide to butyne - $1\frac{1}{2}$ m

Explanation - 1 m.

F] Mechanism of 1,2 and 1,4-addition of Br_2

Formation of allylic cation - 2 m

1,2 or 1,4-product = 2 m.

overall explanation = 1 m.