Kandi Raj College

B.Sc. 3rd Semester Hons. Internal Assessment examination

Subject: Physical Chemistry [CHEMHT-5]

Time: F.M. 10

Answer any two

1. (a) Justify or criticise the following statement: n=0 is not possible for a particle in a box.

   (b) Calculate the linear momentum of photons of wavelength 350 nm. What speed does a hydrogen molecule need to travel to have the same linear momentum? 2+3=5

2. (a) Write Short notes on exergonic and endergonic reactions
   (b)Write down the Gibbs-Duhem equation explaining the terms. What is the significance of Gibbs-Duhem equation?
   2+1+2=5

3. (a) What is the dimension of viscosity? Give two examples of high viscosity liquids and two examples of low viscosity liquids.
   (b) In an X-ray photoelectron experiment, a photon of wavelength 121 pm ejects an electron from the inner shell of an atom and it emerges with a speed of 56.9 m s^{-1}. Calculate the binding energy of the electron.
   3+2=5

4. (a) Define eigenfunction.
   (b) Identify which of the following functions are eigenfunctions of the operator d/dx
   i) e^{ikx}
   ii) $\cos kx$
   iii) kx
   iv) e^{-ax^2}
   Give the corresponding eigenvalue where appropriate.

1+4=5

Kandi Raj College

Internal Asssesment-2020

Class- B.Sc(Hons) 3rd Sem

Sub. Inorganic Chemistry

Course Code: CEMH/CC-T-06

Full Mark-10 Time-

Answer any five questions

1. Explain the bond angle of the following mole?
   OF_2, OCl_2, OH_2
2. Explain the state of hybridization of $Ni(CO)_4$ and calculate its magnetic moment?
3. Compare the hydration enthalpy of K^+ and F^-?
4. $r_{Sr^{2+}}$ is 113pm and r_{F^-} is 135 pm, predict the crystal geometry?
5. $MgCO_3$ thermally less stable than $CaCO_3$ -explain?
6. Solubility of the Agx in the H_2O decreases from fluoride to Iodide- Explain?
7. Explain why $PbCl_2$ is white while PbI_2 is yellow?

Paper - CHEMHT-7.

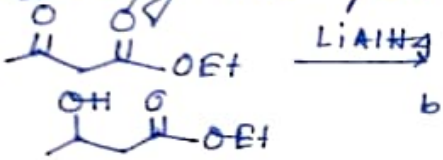
Choose the right option —

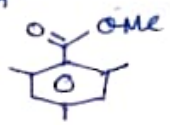
5 × 2 = 10

1. 1° - kinetic isotopic eff. is observed for —
   a. chlorination of C_6H_6 b. nitration of C_6H_6 c. sulfonation of C_6H_6.

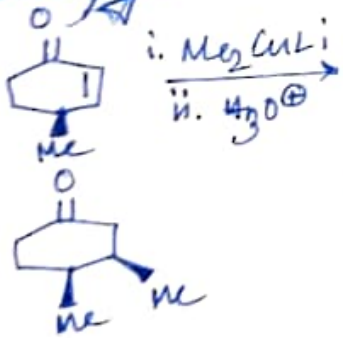
2. $PhCH=CH_2 \longrightarrow PhCH_2CH_2OH$. for this hydration suggest proper reagent —
   a. $H_3O^{\oplus}$ b. $Hg(OAc)_2, NaBH_4$ c. SiO_2OH, $H_2O_2/\overset{\ominus}{O}H$

3. Identify the pdt —



4. Acid catalised hydrolysis of  follows —
   a. AAc^1 b. AAL^1 c. AAc^2

5. Identify the major pdt —



Kandi Raj College

Internal Asssesment-2020

Class- B.Sc(Hons) 3rd Sem

Sub. Inorganic Chemistry

Course Code: CEMH/SEC-1

Full Mark-10 Time-

Answer any five questions

1. Draw the structure of $Zn(EDTA)^{2-}$ complexe.?
2. What is BOD?
3. Give an example of two food preservating agent ?
4. Write the difference between TLC and paper chromatography?
5. Draw the structure of the indicator which is used in complexometry titrations ?
6. Write the two protocols for sampling?

Kandi Raj College
Dept. of Chemistry

Paper – CHEM-HGE-T-3

নিম্নোক্ত প্রশ্নগুলির উত্তর দাও — 5 × 2 = 10

1. কার্নট সাইকেল (Carnot Cycle) বলতে কী বোঝ ?

2. বাফার দ্রবণ কাকে বলে ? একটি বাফার দ্রবণের উদাহরণ দাও ।

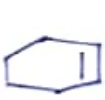
3. $NH_3(g) + HCl(g) \rightleftharpoons NH_4Cl(s) + Q$ kJ
এই বিক্রিয়ার সাম্য ওপর চাপ ও তাপের প্রভাব ব্যাখ্যা কর ।

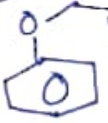
4. রাসায়নিক বিক্রিয়ার শিখর শক্তি বলতে কী বোঝ ।

5. নিম্নোক্ত বিক্রিয়ার বিক্রিয়াজাত পদার্থ লেখ —

a. $PhCHO \xrightarrow[50\%]{NaOH}$?

b. $Me_2C(OH)-C(OH)Me_2 \xrightarrow{H^{\oplus}}$?

c.  $\xrightarrow[KMnO_4]{\text{alkaline}}$?

d.  $\xrightarrow{\Delta}$?