Prepare separate pdf files for Paper VIB and Paper VIIB and also upload it separately as per provisions in the uploading portal.

Time: 3 hours for Full Marks 50 [Paper VIB (F.M. 25) + Paper VIIB (F.M. 25)]

2021
B.A./B.Sc. Part III Honours Examination
University of Calcutta
CHEMISTRY
Paper VI
Group B
F.M. 25

FAKIR CHAND COLLEGE CENTRE (551)

[Use A4 pages and black ink only for writing answers. Write Roll number and Registration number at the top and page number at the bottom of each page. Scan you admit card and make a single pdf file with the answer script.]

1. Analysis of ^{1}H-NMR spectra of 4-Aminobenzoic Acid shows peaks with δ values 12.0, 7.7, 6.6, 5.9 ppm. Answer the followings:
   a) Draw the structure of the molecule showing different types of hydrogen.
   b) In a tabular form assign the given δ values for different hydrogens, give the number of hydrogens for each δ value (from the structure of the compound) and write the splitting pattern for each peak with explanation (pointwise explanation in a few lines. Avoid elaborative writing). 1+2+2+2+3+5 = 15

2. Analysis of FT-IR spectra of 4-Aminobenzoic Acid shows peaks with $\overline{\nu}$ values 3460 and 3360, 2930 and 2860, 2700-2500, 1670 cm^{-1}. Draw the structure of the molecule and assign the peaks in tabular form. 2+8 = 10

2021

B.A./B.Sc. Part III Honours Examination

University of Calcutta

CHEMISTRY

Paper: VII B (CHP 35a)

PRACTICAL

F.M. 25

FAKIR CHAND COLLEGE CENTRE (551)

[Use A4 pages and black ink only for writing answers. Write Roll number and Registration number at the top and page number at the bottom of each page. Scan the current admit card and upload in a single pdf file along with the answer script]

1. Write briefly the theory for the experiment, "Determine rate constant of the reaction between H_2O_2 and acidified KI solution", covering the following points.

(i) Write down the overall chemical reaction.

(ii) What is the order of the reaction? Write down the integrated rate equation and working formula. (Derivation not required) 2+1+2 =5

2. Answer all the questions briefly: 2×10 = 20

a) In viscometer, why equal volume of experimental liquids is always transferred into the wider limb to measure time of flow for different solutions?

b) What is the dimension of viscosity coefficient?

c) Using stalagmometer, can you measure surface tension of Hg? Explain briefly.

d) How does the surface tension of acetic acid solution changes with temperature?

e) How does the solubility product of KHTa change in the presence of added NaCl and why?

f) Solubility of all substances in water increases with temperature – Comment.

g) Write down the equation for Clock reaction. Why is it named so?

h) Write the overall order of the reaction, "hydrolysis of ester" in the following two cases:

i) the reaction is catalyzed by NaOH solution.

ii) the same reaction is catalyzed by HCl solution.

i) The partition co-efficient of I_2 between CCl_4 and water is 85. If 2 g of iodine is added to a mixture of 1:5 (v/v) CCl_4 & water, which solvent will contain more iodine? Calculate the relative ratio of I_2 in them.

j) In Iodomerty, starch should be added near end point. Why?