2021
B.A./B.Sc. Semester V Honours Examination
University of Calcutta
CHEMISTRY
Paper DSE-A2
(PRACTICAL)
F.M. 30

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. Images of answer script and admit card must be in a single pdf file.]

The figures in the margin indicate full marks.
(All calculations can be done using calculator)

1. Determine the Michaelis-Menten constant (Km) and the maximum rate (Vmax) using linear least square analysis for the hydrolysis of Glucose (GL) by the enzyme Zymase (Z) to give Ethanol (ET) according to

$$GL + Z \rightarrow ET + Z$$

(a) Write down the theory using the following points:

(i) Michaelis-Menten equation and it's derivation.

(ii) Lineweaver-Burk plot and its significance.

(iii) Principle of Linear Least Square analysis and its implementation in Excel, determination of slope and intercept. (4+4+7)

(b) Determine the Michaelis-Menten constant (Km) and the maximum rate (Vmax) using the following data using **Least square expressions for slope and intercept**. 12

(No Excel graph or calculation using Excel function/sheet is needed; all the calculations must be done using calculator and be represented in a proper tabulation form in your answer script)

[GL], mM	**Rate, d[T]/dt, mM/s**
1.00	0.0117
1.25	0.0143
1.50	0.0165
2.50	0.0258
5.00	0.0369
10.00	0.0541
15.00	0.0613
20.00	0.0657

(c) Write down the results, Km and Vmax for Least Square analysis. (1½×2)