

**U.G. 1st Semester Examination - 2020**  
**Molecular Biology and Biotechnology**  
**[HONOURS]**  
**Course Code : MBBT-H-101-P-CCR1**  
**(Biochemistry and Metabolism)**  
**[PRACTICAL]**

Full Marks : 20

Time : 2 Hours

*The figures in the right-hand margin indicate marks.*

1. Perform any **one** of the experiments from the following :

Write principle, required materials, methods and corresponding table (if any). Analyze the data if given with the question. 7

- a) Prepare 50ml of 1 M phosphate buffer having pH 7.2.
- b) Determine optimum temperature of the supplied enzyme. Interpret the data given below.

Sample	Enzymatic activity ( $\mu\text{M min}^{-1}$ )
Blank	0.00
Substrate+Enzyme incubated for 30 min at 30°C	0.04
Substrate+Enzyme incubated for 30 min at 37°C	0.07
Substrate+Enzyme incubated for 30 min at 42°C	0.02

[Turn Over]

- c) Estimate enzymatic activity of the supplied enzyme from the supplied sample marked 'S'.

Draw standard graph using the data given below. [Please check the highlighted questions (c and d) and tables with the paper setter]

Concentration of Substrate (Use unit according to practical you have done) [UB: 'of your choice' instead of 'according to practical you have done']	Optical Density at wavelength measured in the practical class [UB: 'measured in the practical class' according to practical you have done']
0	0.00
0.2	0.20
0.4	0.40
0.6	0.60
0.8	0.80
1.0	1.00

- d) Calculate enzyme activity using the table provided.

Sample	Optical Density at wavelength measured in the practical class
Blank	0.00
Substrate+Enzyme incubated for 30 min at 37°C	0.57

Determine  $K_m$  and  $V_{max}$  of the supplied enzyme with double reciprocal plot.

- e) Estimate glucose concentration (Required data provided in the table) in the supplied blood sample marked 'A' through glucose oxidase method.

Sample	Absorbance at 505 nm
Blank	0.00
Test	0.25
Sample	0.21

- f) Design and perform an experiment to verify Beer's law. Required data given below.

Sample No.	Concentration of Chromophore (colored substance) in M	Optical density 600 nm
1	0	0.00
2	2	0.10
3	4	0.20
4	6	0.30
5	8	0.40
6	10	0.50

- g) Identify the unknown amino acid by paper chromatography using at least three known amino acids. Also calculate retardation factor. Required data given below.

Amino acid	Distance migrated by amino acid (in cm)	Distance migrated by solvent (in cm)
Glycine	1.2	6.1
Methionine	2.5	6.1
Proline	1.9	6.1
Amino acid-Unknown	2.5	6.1

- Identify the biomolecule (carbohydrate/lipid/protein) present in the supplied sample marked 'B'. Consider the biomolecule present in the sample 'B' is protein. 3
- Laboratory Note Book. (Submit the scanned copy of laboratory note book) 5
- Viva-voce. (Viva-voce will be held on Google meet/Google duo/Whatsapp call). 5

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