

U.G. 3rd Semester Examination - 2021**Molecular Biology & Biotechnology****[HONOURS]****Course Code : MBBT(H)303(P)/CCR-7****(Biophysics)****[PRACTICAL]**

Full Marks : 20

Time : 2 Hours

*The figures in the right-hand margin indicate marks.**Examinees are advised to answers in their own words as far as practicable.*

1. Assuming that you need to perform any **one** of the following experiments, provide the answer:

10×1=10

- a) Write down the principle, requirement and procedure of determination of the strength of the supplied NaOH solution using 0.1 N HCl solution. Interpret the result. Explain the role of the pH indicator used in this experiment.

2+2+3+2+1

OR

- b) Write down the principle, requirement and procedure for preparation of 100 ml of

Phosphate buffer (0.1 M) having pH 7.0 and 100 ml of Tris-HCl buffer (0.1 M) having pH 8.0. After preparation you kept both the buffers in refrigerator and checked the pH of the refrigerated buffer solutions. Is there any variation in pH for refrigeration? Interpret the results.

3+2+3+2

OR

- c) Write down the principle, requirement and procedure for verification of Lambert-Beer's law. How would you determine the absorption maximum of the supplied Sample? Is it possible to have multiple absorption maxima for a particular sample? Interpret the result.

2+2+3+3

OR

- d) Write down the principle, requirement and procedure of protein purification using Ion-exchange chromatography. You have been provided with a Metal-affinity column, an Ion-exchange column and a Gel-filtration column. In which order would you use these columns for purification of a 6X his-tag protein. Justify and interpret the result.

2+2+3+3

[Turn over]

OR

- e) Write down the principle, requirement and procedure for determination of isoelectric pH of amino acid Glycine by titration. What would be the difference in the pattern of the titration curve, if Glycine is replaced by Glutamic acid or Lysine? Interpret the result. 2+2+3+3

OR

- f) Explain the principle, procedure and the software required for determination of the three dimensional experimental structure of a protein with homologous (protein) structure available in the PDB using X-ray diffraction. 2+5+3

OR

- g) Determine the mean axis of the heart and the heart rate from the supplied ECG. What are the general changes in the ECG pattern with advancing age? 8+2

OR

- h) Write down the principle, requirement and procedure for separation, identification and determination of R_f value of two α -amino acids from a mixture of amino acids using Thin Layer Chromatography. Interpret the result.

2+2+3+3

2. Laboratory notebook/ Practical based home assignment (online submission to the Examiner): 5
3. Viva-voce (to be conducted by the Examiner through any online platform): 5
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