

U.G. 3rd Semester Examination - 2020
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. Perform any **one** experiments: 10×1=10
- a) Write down the principle, requirement and procedure for preparation of 100 ml of Citrate buffer (0.1 M) having pH 5.6 and 100 ml of Phosphate buffer (0.1 M) having pH 7.0. After preparation you keep the buffers in refrigerator and check the pH of the refrigerated buffer solutions. Is there any variation in the pH? Interpret the results. 3+2+3+2

OR

- b) Write down the principle, requirement and procedure for determination of the strength of the supplied HCl solution using 0.1 N NaOH

[Turn over]

solution. Explain the role of the pH indicator used in this experiment. How can you be sure that the strength of the supplied NaOH solution is 0.1 N? Interpret the result. 2+2+3+3

OR

- c) 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 an acidic or a basic amino acid? Interpret the result. 2+2+3+3

OR

- d) Explain the principle, procedure and the software required for determination of the three dimensional experimental structure of a protein with no homologous (protein) structure available in the PDB using X-ray diffraction. How will you address the phase problem in this case? 7+3

OR

- e) Write down the principle, requirement and procedure of protein purification using Size exclusion chromatography. You have been

provided with a Metal-affinity column, an Ionexchange 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

OR

- f) Write down the principle, requirement and procedure for verification of Lambert-Beer's law spectrophotometrically using any dye. How would you determine the absorption maximum of the supplied dye? Suppose your dye is showing deviation from Lambert-Beer's law at high concentration, what could be the probable reason? Interpret the result. 2+2+3+3

OR

- g) Determine the mean axis of the heart and the heart rate from the supplied ECG. What would be the change in the ECG pattern if a person just suffered from Myocardial infarction? 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
