

**Final Assessment Test – May 2024**Course: **TBIT106L - Biochemistry**Class NBR(s): **4248 / 4813**Time: **Three Hours**Slot: **C1+TC1**Max. Marks: **100**

- KEEPING MOBILE PHONE/ELECTRONIC DEVICES EVEN IN 'OFF' POSITION IS TREATED AS EXAM MALPRACTICE
- DON'T WRITE ANYTHING ON THE QUESTION PAPER

General Instruction: Draw diagrams and structures wherever necessary.

Answer any TEN Questions

(10 X 10 = 100 Marks)

1. What are the extraordinary properties present in living organisms that differentiate them from non-living matter?
2. How hydrogen bonding provides unusual bonding properties for water?
3. Compare and contrast the structures of reducing and non-reducing disaccharides.
4. What are proteoglycans? Discuss with reference to aggrecans and syndecans.
5. Trace the diagrammatic metabolic pathway of citric acid cycle with enzymes and coenzymes.
6. Predict the structures of histidine with the charges at pH 1, 4, 8 and 12 when it is titrated with a base. ($pK_{a1} = 1.82$; $pK_{a2} = 6$; $pK_{a3} = 9.17$)
7. Distinguish the structural features of collagen and keratin.
8. Summarize the double helical characteristics of B form of DNA.
9. Classify saturated and unsaturated fatty acids based on structure and nomenclature.
10. Enumerate the steps involved in fatty acid synthesis with overall reaction for synthesis of palmitate.
11. Illustrate the electron flow path from NADH to Oxygen.
12. a) What is the pH of a solution that contains 0.25 M sodium acetate and 0.65 M acetic acid ($pK_a = 4.76$)? [5]
b) Calculate the pH of a solution prepared by diluting 4 ml of 3 M HCl to a final volume of 100 ml with water. [5]