

2022

CHEMISTRY — HONOURS

Paper : SEC-A-2

(Analytical Clinical Biochemistry)

Full Marks : 80

The figures in the margin indicate full marks.

*Candidates are required to give their answers in their own words
as far as practicable.*

Answer *question no. 1* (compulsory) and *any twelve* questions from the rest. 1×20

1. (a) Name an amino acid which is not synthesised in our body.
- (b) Write down the structure of the imino acid present in protein.
- (c) Name an simple protein presents in blood.
- (d) Which is the most stable and common conformation for a polypeptide chain?
- (e) Mention the number of peptide bonds present in a tripeptide.
- (f) Mention the class of enzyme that joins the ends of two strands of nucleic acid.
- (g) What is formed with the combination of apoenzyme and coenzyme?
- (h) Name the enzyme that catalyzes the first step of glycolysis.
- (i) In Krebs cycle, what is total yield of ATP produced when two carbon acetyl CoA is oxidised to CO₂?
- (j) Write down the name of a monounsaturated and a polyunsaturated fatty acid.
- (k) Mention the name of base not present in RNA.
- (l) What are repeating units of RNA?
- (m) What is the initiation codon in eucaryotes?
- (n) What we call when two monosaccharides differ in configuration around a single carbon atom?
- (o) Write down the full name of NAD.
- (p) Define Michaelis-Menten constant (K_m).
- (q) What is the most important buffer in blood?
- (r) What are ribozymes?
- (s) What does the primary structure of protein represent?
- (t) Give an example of amphipathic lipid.

Please Turn Over

2. (a) Explain the process of lactic acid fermentation. 5
(b) In glycolysis, write down the result of conversion of 1 mol of fructose-1,6-phosphate to 2 mol of pyruvate. 3+2
3. Write TCA cycle schematically, clearly explaining all reactions. 5
4. Explain the α -helix and β -pleated sheet structures of a protein. 5
5. (a) Classify enzymes and give one example for each class. 3+2
(b) What is biocatalysis?
6. (a) What is competitive inhibition in enzyme catalysis? Illustrate with an example. 3+2
(b) Explain stereospecificity of an enzyme.
7. Write down biological importances of triglycerides and cholesterol. What will be the result of increase in level of triglycerides and cholesterol in human body? 5
8. (a) What are pernicious anaemia and sickle cell anaemia? 3+2
(b) How is a polysaccharide isolated?
9. (a) What is diabetes? Mention the main types of diabetes. 3+2
(b) State the difference between serum and plasma.
10. (a) What are the biological roles of DNA? 3+2
(b) Write a short note on gene therapy.
11. (a) Write down the principle for estimation of creatinine in blood. 3+2
(b) What are the abnormal constituents of urine?
12. How is bilirubin estimated in blood? How can you interpret the estimated data of bilirubin level? 5
13. (a) What are the major types of RNA? State their important functions. 3+2
(b) What is Chargaff's rule of DNA composition?
14. (a) Draw a schematic presentation of polynucleotide. 3+2
(b) Write down the structure of adenosine.