

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 CO<sub>2</sub>?
- (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

X(3rd Sm.)-Chemistry-H/SEC-A-2/CBCS

(2)

2. (a) Explain the process of lactic acid fermentation.  
(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  $\alpha$ -helix and  $\beta$ -pleated sheet structures of a protein. 5
  5. (a) Classify enzymes and give one example for each class.  
(b) What is biocatalysis? 3+2
  6. (a) What is competitive inhibition in enzyme catalysis? Illustrate with an example.  
(b) Explain stereospecificity of an enzyme. 3+2
  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?  
(b) How is a polysaccharide isolated? 3+2
  9. (a) What is diabetes? Mention the main types of diabetes.  
(b) State the difference between serum and plasma. 3+2
  10. (a) What are the biological roles of DNA?  
(b) Write a short note on gene therapy. 3+2
  11. (a) Write down the principle for estimation of creatinine in blood.  
(b) What are the abnormal constituents of urine? 3+2
  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.  
(b) What is Chargaff's rule of DNA composition? 3+2
  14. (a) Draw a schematic presentation of polynucleotide.  
(b) Write down the structure of adenosine. 3+2
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