

**2020**

**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. (a) What is the structural difference between cysteine and cystine? 1×20  
(b) Out of triglycerides and phosphoglycerides which is a component of membranes?  
(c) Which metal ion is responsible for blood coagulation?  
(d) Give the full form of PCV related to human blood.  
(e) Kinase belongs to which class of enzymes?  
(f) Indicate the initiation codon in prokaryotes.  
(g) Define activity of an enzyme.  
(h) Mention the names of two ketogenic amino acids.  
(i) Which is the major extracellular cation?  
(j) Name the amino acid, which is the most effective contributor for protein buffering action.  
(k) Indicate the hormone inhibiting gluconeogenesis.  
(l) What is the core enzyme of RNA polymerase?  
(m) Write down the name of a structural protein and a transport protein.  
(n) Name the nitrogenous base present in DNA but not in RNA.  
(o) Mention the number of peptide bonds present in a tetrapeptide.  
(p) What is apoenzyme?  
(q) Name one anticoagulant of human blood.  
(r) Name the cation required for the conversion of prothrombin into active thrombin by thromboplastin.  
(s) Name the class of enzymes that is involved in oxidation reduction reaction.  
(t) Name a non protein compound that catalyses biological system.

**Please Turn Over**

2. (a) Write down the sequence of reactions involved in the preparatory phase as well as pay off phase of glycolysis.
- (b) What are different metabolic fates of pyruvate produced during glycolysis? 3+2
3. Write down the general features of citric acid cycle. Show the schematic presentation of TCA cycle involving all the reactions (formulae of the intermediates not needed). 5
4. (a) How can you classify amino acids based on their structure?
- (b) Name two agents that cause denaturation of proteins. 3+2
5. Compare and contrast the structural features of  $\alpha$ -helix and  $\beta$ -pleated sheet structures of proteins. Name the amino acids that stabilise  $\alpha$ -helix structure. 3+2
6. (a) What is the difference between lyases and ligases? Give an example of each.
- (b) Name the type of enzyme that is required to energise molecules by adding  $P_i$  from ATP. 3+2
7. (a) What are lipoproteins? How can you classify them?
- (b) What are fats and oils? Differentiate between them. 3+2
8. (a) What are phospholipids? Mention their functions.
- (b) What are liposomes? 3+2
9. (a) Describe the structure of prokaryotic ribosome.
- (b) Indicate the function of DNA ligase. 3+2
10. (a) Cite the differences between serum and plasma.
- (b) Specify the vial for collection of blood sugar sample. 3+2
11. (a) Mention the risk factors for coronary artery disease.
- (b) Polyurea is seen under what conditions? 3+2
12. (a) Write down the principle for estimation of creatinine in blood.
- (b) In renal glucosuria, mention the renal threshold for glucose. 3+2
13. What are the common causes of anaemia? How does anaemia affect the body? What is considered severe anaemia? 2+2+1
14. (a) What are 'good' and 'bad' cholesterol and why?
- (b) What is meant by pathological urine? 3+2
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