Biochm-2
Bio Obj
7110

QP Code : **12767**

(2 ½ Hours) [Total Marks : 75

N.B. : (1) **All** questions are **compulsory**
(2) Choice is internal
(3) Draw diagrams wherever necessary
(4) Non programmable calculators are allowed
(5) **Figures** to the **right** indicate **full** marks.

1 (a) Fill in the blanks with the most appropriate answer from the options provided. (any **three**) 3

(i) _____is an imino acid.
(Methionine,Proline, Histidine)

(ii) _____enzyme brings about cleavage of polypeptides.
(Chymotrypsin, Amylase,Transaminase).

(iii) Proteins are not denatured by_____.
(high temperature, low temperature, changes in pH)

(iv) An example of a contractile protein is_____
(hemoglobin, myosin, prothrombin)

(v) Secondary structure of proteins is stabilized by_____.
(peptide bonds, hydrogen bonds, diester bonds)

(vi) _____ is a globular protein.
(Keratin, Collagen, Myoglobin)

(b) Attempt **any one** of the following: 2
(i) Justify how an amino acid can behave as an acid as well as a base.
(ii) Name any four bonds which stabilize the tertiary structure of proteins.

(c) Answer **any one** of the following: 4
(i) Effect of any two proteolytic enzymes on polypeptides.
(ii) Characteristics of peptide bonds.

(d) Write briefly on **any one** of the following: 6
(i) Write **any two** complete reactions of amino acids. Give their biochemical significance.
(ii) Functional diversity of proteins.

2 (a) Fill in the blanks with the most appropriate answer from the options provided. (any **three**) 3

(i) An unit of measurement of enzyme activity is _____.
(International Unit, special activity, specificity)

(ii) Competitive inhibitor of enzyme succinate dehydrogenase is_____.
(malonate, malic acid, succinate)

(iii) _____is a sugar present in RNA and DNA.
(pentose, ketose, hexose)

(iv) DNA contains all the bonds EXCEPT_____.
(hydrogen bonds, phosphodiester bonds, disulphide bonds)

(v) EC class number for ligases is_____.
(2, 4, 6)

(vi) Nucleotide of adenine is called_____.
(adenosine, adenylic acid, adenine phosphate)

(b) Define **any one** of the following: 2
(i) Prosthetic group
(ii) Nucleoside

(c) Write briefly on **any one** of the following: 4
(i) Effect of pH and temperature on enzyme activity.
(ii) Chargaffs rules

(d) Attempt **any one** of the following: 6
(i) A note on enzyme inhibition.
(ii) Physical properties of DNA and the effect of increase in temperature on them.

3. (a) Fill in the blanks with the most appropriate answer from the options provided. (any **three**) 3
(i) _____is a reducing sugar.
(Sucrose, Lactose, Dextrin)
(ii) Storage polysaccharide found in plants is_____.
(starch, glycogen, cellulose).
(iii) Sedoheptulose is a _____sugar.
(ketose, aldose, non reducing)
(iv) Glycogen is a polymer made up _____of units.
(glucose, fructose, lactose)
(v) Heparin is an example of_____.
(homopolysaccharide, storage polysaccharide, heteropolysaccharide)
(vi) Oxidation of glucose at the sixth carbon forms _____acid.
(gluconic, glucuronic, glucaric)

(b) Attempt **any one** of the following: 2
(i) Ene-diol formation
(ii) Structure of sucrose

(c) Answer **any one** of the following: 4
(i) Action of alpha and beta amylase on starch
(ii) Structural polysaccharides

(d) Write briefly on **any one** of the following: 6

(i) Classification of carbohydrates

(ii) Write complete reaction with significance

- Osazone formation
- Formation of gluconic acid

4 (a) Fill in the blanks with the most appropriate answer from the options provided. 3
(any **three**)

(i) pH of a solution of 0.01 N hydrochloric acid is_____
(01, 0.1, 02)

(ii) pH+ pOH =_____
(7, 14, 10^{-7})

(iii) pH= _____
($\log_{10}$ of $[H^+]$, - $\log_{10}$ of $[H^+]$, -$\log_{10}$ of $[OH^-]$

(iv) Half life of a radioisotope is =_____
(Lambda/0.693, 0.693/Lambda, $t_{1/2}$/0.693)

(v) _____radioisotope is used in detection of hypo/hyperthyroidism.
(^{32}P, ^{14}C, $^{131}1$)

(vi) _____is used in Sorenson's titration.
(Formalde hyde, Acetaldehyde, Formic acid)

(b) Define **any one** of the following: 2

(i) Isoelectric pH

(ii) Radioactivity

(c) Answer **any one** of the following. 4

(i) Define buffer. Derive the Henderson- Hasselbalch equation.

(ii) Physiological buffers.

(d) Write briefly on **any one** of the following: 6

(i) Titration curve and ionization forms of glycine.

(ii) Applications of radioisotopes In biological studies.

5. (a) Answer briefly **any one** of the following : 3

(i) Special features of alpha helical structure of proteins.

(ii) Structures of

- one negatively charged amino acid
- one aromatic amino acid

(b) Attempt **any one** of the following: 3

(i) Lineweaver Burk plot and its significance.

(ii) Write the structures of ATP and cAMP.

(c) Write the structure and significance of **any one** of the following: 3

(i) Chitin

(ii) Starch

(d) Write briefly on **any one** of the following: 3

(i) Glass electrode

(ii) Decay constant and half life of a radioisotope

(e) State **true** or **false**, attempt any **three** : 3

(i) t- RNA possesses a clover leaf structure.

(ii) Fructose is an aldose sugar.

(iii) ^{15}N is used in metabolic studies.

(iv) Proline is a sulphur containing amino acid.

(v) Aspartate transcarbamoylase is an allosteric enzyme.

(vi) Peptones are derived proteins.
