P. P. SAVANI UNIVERSITY

Third Semester of B.Sc. Examination
December-2021
SSCH2070–Biomolecules

09.12.2021, Thursday **Time: 09:00 a.m. to 11:30 a.m.** **Maximum Marks: 60**

Instructions:

1. The question paper comprises of two sections.
2. Section I and II must be attempted in separate answer sheets.
3. Make suitable assumptions and draw neat figures wherever required.
4. Use of scientific calculator is allowed.

Section-I (Total Marks - 30)

Q.1 Short Questions **[10]**

1.1 Objectives **[05]**

1.1a All amino acids give purple color by reacting with ninhydrin except ___.

- **A** Histidine
- **B** Proline
- **C** Tyrosine
- **D** Arginine

1.1b A pair of stereoisomers that are non-superimposable mirror images of one another

- **A** Stereoisomers
- **B** Optical isomers
- **C** Enantiomers
- **D** Di-stereoisomers

1.1c Which of the following compound is not involved in Edman degradation?

- **A** Phenyl isothiocyanate
- **B** CF3 COOH
- **C** FDNB
- **D** Phenyl thiocarbonyl

1.1d Cleaving of peptide chain is done by _____

- **A** Tyrosine
- **B** Trypsin
- **C** Tryptophan
- **D** Arginine

1.1e A coiled peptide chain held in place by hydrogen bonding between peptide bonds in the same chain is?

- **A** Primary structure
- **B** α-helix
- **C** β-pleated sheets
- **D** Tertiary structure

1.1f Which of the following proteins was first sequenced by Frederick Sanger?

- **A** Myosin
- **B** Myoglobin
- **C** Insulin

D Haemoglobin

1.1g Which of the following are the storage polysaccharides?

A Glycogen
B Chitin
C Cellulose
D Glucose

1.1h The glycosidic linkage between glucose molecule in maltose is

A β1-4
B β1-2
C α1-2
D α1-4

1.1i How many amino acid residues are there in per turn of α-helix?

A 3.6
B 2.6
C 4.2
D 1.5

1.1j What does the following equation represent?

α-D Glucose +112° → +52.5° ← +19° β- D glucose

A Stereoisomerism
B Optical isomerism
C Mutarotation
D Epimerization

1.2 Answer the Following: (MCQ/Short Question/Fill in the Blanks) **[05]**

1.2a An amino acid is an amphoteric molecule. TRUE/FALSE
1.2b All proteins consist of single polypeptide chain. TRUE/FALSE
1.2c Draw the structure of aromatic amino acids.
1.2d Enlist bonds involved in protein structure.
1.2e What is Polysaccharide? Give two examples.

Q.2 Short Notes (Attempt any two) **[06]**

A Explain: Titration curve of amino acids.
B Write mote on disaccharides.
C Describe about functions of carbohydrates.

Q.3 Explain in detail (Attempt any two) **[14]**

A Describe in detail about steps for determination of protein primary structure.
B Write about cyclic structure of monosaccharides.
C Explain: Classification of amino acids.

Section-II (Total Marks - 30)

Q.1 Short Questions [10]

1.1 Objectives [05]

1.1a The melting point of fatty acids depends upon chain length and _____.

- **A** The shape of the fatty acid
- **B** The position of the double bond
- **C** Charge on the carbon
- **D** Degree of unsaturation

1.1b Name an enzyme which is not proteinaceous in nature?

- **A** Cellulases
- **B** Xylanases
- **C** Ribozyme
- **D** Peptidase

1.1c Inactive enzymes which are not bound to their cofactors are called ___.

- **A** Apoenzymes
- **B** Coenzymes
- **C** Enzyme inhibitors
- **D** Holoenzymes

1.1d The competitive inhibitor malonic acid resembles _____.

- **A** Malic acid
- **B** Succinic acid
- **C** Fumaric acid
- **D** Oxaloacetate acid

1.1e The abundantly distributed enzyme in germinating seeds and adipocytes is _____.

- **A** Nuclease
- **B** Proteases
- **C** Lipase
- **D** Cellulase

1.1f A noncompetitive inhibitor of an enzyme-catalyzed reaction

- **A** Increases Km and increases Vmax
- **B** Increases Km and reduces Vmax
- **C** Reduces Km and increases Vmax
- **D** Reduces Km and reduces Vmax

1.1g The degree of unsaturation of lipids can be measured as____.

- **A** Iodine number
- **B** Saponification number
- **C** Polenske number
- **D** Reichert Meissel number

1.1h Which of the following reaction is catalyzed by Lyase?

- **A** Formation of bonds
- **B** Breaking of bonds
- **C** Intramolecular rearrangement of bonds
- **D** Transfer of group from one molecule to another

1.1i This enzyme was first isolated and purified in the form of crystals___.

- **A** Urease
- **B** Amylase
- **C** Pepsin
- **D** Ribonuclease

1.1j The enzyme fumarase catalyzes the reversible hydration of fumaric acid to l-malate, but it will not catalyze the hydration of maleic acid, the cis isomer of fumaric acid. This is an example of _____.

- **A** Group Specificity
- **B** Reaction specificity,
- **C** Stereospecificity
- **D** Substrate specificity

1.2 Answer the Following: (MCQ/Short Question/Fill in the Blanks) **[05]**

1.2a Define: Km.

1.2b Δ9 indicates a double bond between carbon atoms __ and ____ of the fatty acids

1.2c Give two examples of essential fatty acids.

1.2d Enzyme increases the rate of reaction by lowering the activation energy. TRUE/FALSE.

1.2e What is the difference between metal activated enzyme & metalloenzyme?

Q.2 Short Notes (Attempt any two) **[06]**

A What is active site of enzyme? Write its features.

B Write classification of lipids.

C Write Properties and functions of triacylglycerol.

Q.3 Explain in detail (Attempt any two) **[14]**

A Write in detail about classification of enzymes.

B Write in detail about reversible enzyme inhibition.

C Describe in detail about fatty acids.