P. P. SAVANI UNIVERSITY
Third Semester of B.Sc. Examination
December-2021
SSBT2130–Biochemistry and Metabolism-I

11.12.2021, Saturday **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 This is an example of derived lipids

A Terpenes
B Steroids
C Carotenoids
D All of the above

1.1b Which of the following is an example of unsaturated fatty acids?

A Lauric or Dodecanoic
B Linoleic or octadecatrienoic
C Palmitic or hexadecanoic
D Myristic or tetradecanoic

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

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

1.1d Which of the following form of lipids are also referred as neutral lipids?

A Triacylglycerol
B Steroid
C Phospholipids
D Wax

1.1e Arachidonic acid has 20 carbon atoms with

A 3 double bonds
B 2 double bonds
C 4 double bonds
D 8 double bonds

1.1f The simplest carbohydrate is ....

A Dihydroxy acetone
B Glyceraldehyde
C Glucose
D Fructose

1.1g The end product of hydrolysis of "Starch" by amylase is ...
A Soluble starch
B Amylose
C Maltose
D Glucose

1.1h The α and β forms of D-Glucose are known as ___
A Epimers
B Enatiomers
C Anomers
D Stereoisomers

1.1i Which of the following is the example of heteroglycans?
A Heparin
B Dextrin
C Starch
D Cellulose

1.1j Which of the following is an example of aldopentose?
A Glucose
B Fructose
C Ribose
D Ribulose

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

1.2a What is glycosidic bond?
1.2b Draw the structure of palmitic acid (16:0) and Lenoleic acid (18:2; 9,12)
1.2c Draw the structure of alpha and beta D-Glucose
1.2d What are essential and non essential fatty acids?
1.2e Define glycosidic bond

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

A What are saturated and unsaturated fatty acids? Give suitable examples.
B How carbohydrates are significant?
C Define: Reducing and non reducing sugar, Epimers

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

A Discuss classification of carbohydrates with suitable example.
B Explain Bloor's classification of lipids
C Give an account on lactose, sucrose, and starch.

Section-II (Total Marks - 30)

Q.1 Short Questions [10]

1.1 Objectives [05]

1.1a Choose the incorrect statement out of the followings

A Only L amino acids are found in the biological system
B Glycine is optical inactive
C Tyrosine is a modified amino acid
D Seleno cysteine is 21st (non-classical) amino acid

1.1b Amino acids with aromatic side chain are

A tryptophan, asparagine, tyrosine
B tryptophan, threonine, tyrosine
C phenylalanine, tryptophan, serine
D phenylalanine, tryptophan, tyrosine

1.1c Out of these, which one is the non-essential amino acid?

A Lysine
B Threonine
C Serine
D Histidine

1.1d Protein/enzyme needs to be in its _____structure in order to do biological function?

A Primary
B Secondary
C Tertiary
D Quaternary

1.1e Nucleic acid is _____.

A Negatively charged
B Positively charged
C Neutral
D All of the above

1.1f The sugar that is in the backbone of DNA is called

A Deltaribose
B Deoxyribulose
C Deoxyribose
D Deltaribulose

1.1g Nucleotide bases pair in DNA through

A hydrogen bonds between complementary bases
B ionic bonds between complementary bases

C non-polar bonds between complementary bases
D hydrophobic bonds between complementary bases

1.1h What nucleotide base does RNA contain that DNA does not?
- **A** Adenine
- **B** Cytosine
- **C** Thymine
- **D** Uracil

1.1i The information for protein synthesis is stored in_____?
- **A** Amino acids
- **B** Fats
- **C** Glucose
- **D** Nucleic acids

1.1j The primary structure of protein is maintained by_____?
- **A** Hydrogen bond
- **B** Di-sulfide bond
- **C** Peptide bond
- **D** Ionic bond

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

1.2a Draw the chemical structure of 'Tryptophan"
1.2b Draw the chemical structure of 'Nucleotide'
1.2c Give names of purine bases present in DNA.
1.2d What do you mean by 'Isoelectric point'
1.2e Give a name of charged aminoacids.

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

A Give comparative accounts on various forms of DNA
B What are the classes of amino acids based on their polarity? Explain with examples.
C Explain various biological functions of proteins.

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

A Describe the standard (Watson and Crick model) structure of DNA with suitable diagram.
B Explain primary, secondary, tertiary and quaternary level of proteins structure with suitable illustration.
C Describe different types of RNA found in cellular system with suitable diagrams for each class.