

Printing Pages :2

Paper Code: B110301T C (SVSU:2023-24/R)

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| Enrollment No. |  |  |  |  |  |  |  |  |  |  |  |
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Program Name: B.Sc.

(Biotechnology/ Microbiology/ Biochemistry)

III Semester / 2<sup>nd</sup> Year Examination

Subject Code: B110301T

Subject Name: Tools and Techniques in Biochemistry

[Time : 03:00 Hours ]

[Max. Marks : 75]

Note : Attempt all the questions as per given instructions.

1. Multiple Choice Questions (MCQs) [01×15=15]
  - I Positively charged molecules (anions) will attract towards  
(a) cathode (b) anode (c) both a and b (d) none of these
  - II Choose the popular adsorbents in chromatography  
(a) iron (b) polypropylene (c) silica (d) all of these
  - III The factors affecting electrophoresis are  
(a) ionic strength (b) temperature (c) viscosity (d) all of these
  - IV The electric current is carried by buffers, as buffers keep the pH and charge surrounding the  
(a) analyte constant (b) temperature constant  
(c) mixture constant (d) none
  - V Chromatography technique was developed by  
(a) M. Tswett (b) Tiselius (c) Svedberg (d) Sanger
  - VI Agarose is a complex sugar chain obtained from  
(a) green seaweed (b) red seaweed  
(c) cinchona plant (d) None of these
  - VII In chromatography, the stationary phase can be  
(a) Solid or liquid (b) Liquid or gas (c) Solid only (d) Liquid only
  - VIII In general, chromatography is the  
(a) color writing (b) to write (c) pigment writing (d) all of these
  - IX Sodium Dodecyl Sulfate (SDS) used in polyacrylamide electrophoresis is an  
(a) Anionic detergent (c) Non-ionic detergent  
(b) Cationic detergent (d) None of these
  - X Centrifugation is used to separate two  
(a) immiscible liquids (b) force (c) size (d) both a and c

**XI In the process of centrifugation, the separation of molecules based on**  
(a) Size (b) Density (c) Both a and b (d) None of these

**XII Choose the type of chromatography based on mechanisms**  
(a) adsorption (b) partition (c) none of these (d) both a and b

**XIII The mobile phase leaving the column in chromatography is known as**  
(a) chromatogram (b) elute (c) Analyte (d) All of these

**XIV The strongest bonding is**  
(a) Hydrogen binding (b) Covalent bonding  
(c) Non-covalent bonding (d) None

**XV In the process of centrifugation, the high speed centrifuge can regulate the**  
(a) speed (b) temperature (c) both a and b (d) gravity

**2. Answer in long (any three) [ 10×3=30]**

- I Define centrifugation. Write in detail about the principle, types and various applications of centrifugation.
- II What do you understand by chemical bonding? Describe in detail about the different types of chemical bonding.
- III Give a detailed description of microscopy and its types.
- IV Write a detailed note on chromatography and its types with different applications.

**3. Answer in short (any five) [5x6=30]**

- I Explain about the various types of centrifuge rotors.
- II Describe in brief about hydrogen bonding.
- III Write the short note on electrophoresis.
- IV Explain in brief about the density gradient centrifugation.
- V Draw a well labelled diagram of compound microscope.
- VI What is spectrophotometry? Write in brief.
- VII Write a short note on resolution, magnification and numerical aperture.
- VIII Give a brief description of fluorescence microscopy.



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Program Name-

B.Sc.Biotechnology/Microbiology/Biochemistry

III-Semester/II-Year Examination

Subject Code-B080301T

Subject Name -Basic Biochemistry and

Microbial Physiology

[Time :03:00 Hours ]

[Max. Marks :75]

Note : 1. Attempt all the questions as per given instructions.

## 1. Multiple Choice Questions (MCQs) [01×15=15]

- I Tertiary structure of a protein describes  
(A) The order of amino acids (B) Location of disulphide bonds  
(C) Loop regions of proteins (D) The ways of protein folding
- II A positive Benedict's test is not given by  
(A) Sucrose (B) Lactose (C) Maltose (D) Glucose
- III The enzymes of beta-oxidation are found in  
(A) Mitochondria (B) Cytosol (C) Golgi apparatus (D) Nucleus
- IV The enzymes which break up starch into sugar are called  
(A) Hydrolases (B) Amylases (C) Lipases (D) Nucleases
- V What is the general term used for the anaerobic degradation of glucose to obtain energy?  
(A) Anabolism (B) Oxidation  
(C) Fermentation (D) Metabolism
- VI Well stoppered thermos flask contains some ice cubes. This is an example of  
(A) Closed system (B) Open system  
(C) Isolated system (D) Non thermodynamics system
- VII A triose sugar is  
(A) Glycerose (B) Ribose (C) Erythrose (D) Fructose
- VIII Which of the following is pyrimidine nucleotide?  
(A) Uracil (B) Cytosine (C) Thymine (D) All of the above
- IX Which of the following is the first complex (Complex I) of ETS?  
(A) NADH dehydrogenase (B) Cytochrome aa<sub>3</sub>  
(C) Cytochrome bc<sub>1</sub> (D) ATP synthase
- X Rapid bacterial growth phase is known as  
(A) Log (B) Lag (C) Lack (D) None of these

- XI** Father of microbiology is  
 (A) Louis Pasteur (B) Lister  
 (C) A.V. Leeuwenhock (D) Robert Koch
- XII** Adult hemoglobin contains \_\_\_\_\_ polypeptide chains  
 (A)  $2\alpha, 2\gamma$  (B)  $2\alpha, 2\beta$  (C)  $2\alpha, 2\delta$  (D)  $2\beta, 2\gamma$
- XIII** The sugar found in DNA is  
 (A) Xylose (B) Ribose (C) Deoxyribose (D) Ribulose
- XIV** A polysaccharide which is often called animal starch is  
 (A) Glycogen (B) Starch (C) Inulin (D) Dextrin
- XV** Ketone bodies for ATP production?  
 (A) Liver (B) Muscle (C) Brain (D) R.B.C
- 2. Answer in long (any three) [10×3=30]**

- I** What is the basic unit of carbohydrates and protein and describe classification of these molecules with the help of flow chat and diagrams.
- II** Explain Basics of Thermodynamics. Explain First and Second law of Thermodynamics with examples?
- III** Describe Nucleic acid, Double helical structure of DNA, Differentiate DNA and RNA with valid 6 points.
- IV** Describe the process of Nutrient uptakemechanisms in microbes and explain active passive and facilitated diffusion transport with aid of diagrams.
- 3. Answer in short (any five) [5×6=30]**

- I** Define enzyme? what is the meaning of given terms-  
 holozymes, apoenzyme, cofactors, prosthetic group and coenzyme.
- II** Give a note on bacterial growth curve with its suitable graph.
- III** Describe relative permeability of different classes of molecules across synthetic lipid bilayer by the diagram.
- IV** Explain amino acid and their peptide bond formation with the help of diagram.
- V** Define Coupled reaction and equilibrium constant in the favor of thermodynamics.
- VI** Differentiate between fibrous and globular protein in detail with appropriate diagram.
- VII** What is buffer? Define pH.



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**B.Sc. (Biotechnology/ Microbiology/ Biochemistry)**

**III Semester / II Year Examination**

**Subject Code: B100301T**

**Subject Name: Biochemistry and Biochemical  
Tools**

[Time : 03:00 Hours ]

[Max. Marks : 75]

Note: 1. Attempt all the questions as per given instructions.

**I. Multiple Choice Questions (MCQs)**

[01×15=15]

- I What is an apoenzyme?
  - a) It is a protein portion of an enzyme
  - b) It is a non-protein group
  - c) It is a complete, biologically active conjugated enzyme
  - d) It is a prosthetic group
- II Name the coenzyme of riboflavin (B2)?
  - a) NAD or NADP      b) FAD and FMN
  - c) Coenzyme A      d) Thiamine pyrophosphate
- III Which of this vitamin is associated with the coenzyme Biocytin?
  - a) Nicotinic acid      b) Thiamine      c) Biotin      d) Pyridoxine
- IV Name the enzyme secreted by pancreas?
  - a) Pepsin      b) Chymotrypsin      c) Trypsin      d) Alcohol dehydrogenase
- V What is the solubility of lipids in water?
  - a) Soluble      b) Partially soluble      c) Insoluble      d) Partially insoluble
- VI Find the INCORRECT statement about the biological functions of lipids.
  - a) Storage form of metabolic fuel
  - b) Have a protective function in bacteria, plant, and insects
  - c) The structural component of membranes
  - d) Exhibit increased catalytic activity
- VII 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
- VIII Which of the following is not a component of a phospholipid?
  - a) Phosphate      b) Alcohol      c) Glycerol      d) Protein
- IX Which of the following sterol is present in the cell membrane of fungi?
  - a) Ergosterol      b) Stigmasterol      c) Sitosterol      d) Campesterol

**P.T.O.**

- X Which of the following is also known as invert sugar?  
a) Sucrose b) Fructose c) Dextrose d) Glucose
- XI Name the major storage form of carbohydrates in animals?  
a) Cellulose b) Chitin c) Glycogen d) Starch
- XII Carbohydrates are also known as \_\_\_\_\_  
a) Hydrates of carbon b) Carbonates  
c) Glycolipids d) Polysaccharides
- XIII What is the full form of DNA?  
a) Degenerative acid b) Deoxyribonucleic acid  
c) Deadly nucleic acid d) Disoriented acid
- XIV How many types of nucleic acids are present in the living systems?  
a) One b) Two c) Three d) Four
- XV Which of the following is not a function of RNA?  
a) Messenger b) Catalysis  
c) Adapter d) Modifier

2. Answer in long (any three)

[ 10×3=30]

- I Describe the structure and properties of Amino acids.
- II Write a comprehensive note on Chromatography.
- III Explain the kinetics of enzyme actions.
- IV Give a note on deficiency of vitamins which related to human diseases.

3. Answer in short (any five)

[6×5=30]

- I Write a short note on double helical model of DNA.
- II What is denaturation of proteins?
- III Give a brief note on competitive, non-competitive and uncompetitive enzyme inhibition.
- IV Write all the steps of TCA cycle.
- V Write a short note on fat soluble vitamins.
- VI Write a short note on urea cycle.
- VII Write the principle and application of NMR technique.