

SARDAR PATEL UNIVERSITY
S.Y. BSc. (CBCS) (THIRD SEM.) EXAMINATION
2011

Friday, 11th November

10.30 am to 1.30 pm

US03CBCH01 : BASIC BIOCHEMISTRY

Total Marks: 70

Note: Figures to the right indicate full marks.

Q.1 Select correct option for following MCQs.

[10]

- (1) Sucrose is not _____.
 (a) Cane Sugar (b) Table Sugar (c) Invest Sugar
 (d) Reducing Sugar
- (2) Which one is not shape of Lactosazone?
 (a) Powder-Puff (b) Flower of touch-me not
 (c) Hedg-Hog like (d) Petal of Sun-flower
- (3) Which one is the Sweet amino acid?
 (a) Glycine (b) Leucine (c) Arginine (d) Isoleucine
- (4) Which amino acid is basic amino acid?
 (a) Lysine (b) Leucine (c) Isoleucine (d) Non of these
- (5) DNA is form by polymer of _____.
 (a) Nucleotide (b) Peptide (c) Saccharide (d) Glyceride
- (6) Which bond is not present in DNA?
 (a) Peptide (b) Phosphodiester (c) glycosidic (d) Hydrogen
- (7) _____ is considered as energy currency of body.
 (a) ATP (b) UTP (c) CTP (d) TTP
- (8) Cyanocobalamine is the chemical name of _____ vitamin.
 (a) B₁₂ (b) B₂ (c) B₃ (d) B₁
- (9) Which mineral is not essential for acid-base balance?
 (a) Na⁺ (b) Cl⁻ (c) mn (d) K⁺
- (10) Which mineral plays important role as second messenger?
 (a) PhO₄ (b) K⁺ (c) Na⁺ (d) Calcium

Q.2 Answer in short (Any six)

[12]

- (1) Explain "Glucose and Manose are not epimeric pair".
- (2) Draw the structure of α -D galactofurnose and D-erythrose.
- (3) Define with example Essential amino-acids.
- (4) Draw the Structure of ATP and dAmp.
- (5) Define Nucleic acid and Nucleotides.
- (6) Define enthalpy and entropy.
- (7) Write Biochemical functions of Vit B₁.
- (8) Write dietary sources and RDA value for sodium.

Q.3 Explain in detail- Functions of Carbohydrates.

[08]

OR

Q.3 Write short note on (a) Maltose (b) Sucrose.

[08]

- Q.4 Explain in detail:
 (a) Zwitter ion [04]
 (b) Ninhydrin reaction for amino acids [04]
OR
- Q.4 Write short note on:
 (a) Titration Curve of Glycine [04]
 (b) Stereo-specificity [04]
- Q.5 Explain in detail 'Physical Properties of DNA'. [08]
OR
- Q.5 Explain in detail 'Secondary structure of DNA'. [08]
- Q.6 Explain the Function of
 (a) ATP in cell as bioenergetics [04]
 (b) Acetyl CoA [04]
OR
- Q.6 How metabolic reactions are interdependent as interconnected? [08]
- Q.7 (a) Explain Characteristics of Vitamins. [04]
 (b) Write biochemical function of Vit. A. [04]
OR
- Q.7 Do as directed:
 (a) Difference between Water soluble and Fat soluble vitamins. [04]
 (b) Write Biochemical function of Vit. C. [04]
- Q.8 (a) List out Various biochemical functions of Calcium. [04]
 (b) Write sources of Calcium. [04]
OR
- Q.8 List out Various biochemical functions of following:
 (a) Iodine [04]
 (b) Iron [04]

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SARDAR PATEL UNIVERSITY
EXTERNAL EXAMINATION –NOVEMBER-2011
S.Y.B.Sc. Biochemistry. US03CBCH02

BIOPHYSICAL CHEMISTRY

DATE:- 12/11/2011 Total marks:70 Time:10:30 a.m-1:30 p.m

Q-1. Answer the following: (1 mark each)

(10)

1. Filter is used in

- a) colorimeter b) Flurometer
c) Spectrometer d) NMR

2. Emulsoids are example of

- a) Lyophobic colloid b) Protective colloid
c) Hydrophilic colloid d) None of the above

3. Which types of micro-organisms required oxygen for their growth & survival?

- a) Pathogenic b) Anaerobic
c) Aerobic d) Acid-fast

4. Which terminology refers strictly to the flow of the solvent

- a) Osmosis b) Viscosity
c) Diffusion d) Surface tension

5. Direct personal observation is necessary for the collection of

- a) Secondary data b) Government data
c) Online data d) Primary data

6. The characteristic stub is present in

- a) Survey b) Table
c) Frequency d) Attribute

7. High speed centrifuge is used for the separation of

- a) Erythrocytes b) Leucocytes
c) Microsomes d) Mitochondria

8. When gravitational force is counted with sedimentation rate it is known as

- a) RCF b) CFR
c) G d) MGF

9. Equation for frequency

- a) $E=hv$ b) $E=hc/\lambda$
c) $v=c/\lambda$ d) $\sigma=1/\lambda$

10. Chemical formula for water is

- a) H_2O_2 b) H_2O
c) $2(HO)$ d) H_4O_2

Q-2.. Short answers : Answer any six.

(12)

1. List the radiant energy sources used for visible spectrometer, U.V. spectrometer and Spectro-flurometer.
2. Explain principle of sedimentation.
3. Write on photo emissive tube.
4. What are the microbial characteristics of waste water?
5. What are lyophilic colloids?
6. What is Donnan-membrane equilibrium?
7. List the types of rotors and write Svedberg unit.
8. Define and give formula for arithmetic mean and median.
9. Draw structure of water and list the methods to measure body water.
10. What is frequency? Define each.

Q-3. Long Questions: (8 marks each)

(48)

- 3 } 1. a) Write note on acid-base balance in healthy persons.
b) Highlight on distribution of water in body.

OR

- a) Discuss regulatory mechanism of water balance.
- b) Write a brief account on electrolyte metabolism.

- 4 } 2. a) Explain biological significance and colloids.
b) Discuss Donnan-membrane equilibrium

OR

- a) Define colloids and explain its properties.
- b) Discuss significance of viscosity.

- OR } 3. a) Write note on different types of rotors used in centrifuge.
b) Give brief account on Density Gradient Centrifugation.

OR

- a) Explain Differential centrifuge to obtain fractions from homogenate.
- b) Give brief account on ultracentrifuge.

4. Write note on any two:

- a) Monochromators
- b) Dual beam operation
- c) Photocells
- d) Components of spectro flurometer.

5. Give brief account on any two:

- a) Anaerobic sludge digestion
- b) Advantages and Disadvantages of Advance treatments.
- c) Biological treatment by trickling filter.
- d) Solid waste disposal.

6. a) Write note on parts of good table.
b) Application or use of Bio-statistics.

OR

Calculate mean, mode, median for the following data: Serum Cholesterol level of human population are as under. Calculate for male and female and compare the results.

Male	110,78,116,118,120,145,126,109,115,140,185,116
Female	115,85,75,95,180,210,195,115,135,145,168.

$$\bar{x} = \bar{x} = \bar{x}$$

[57]

No. of Printed Pages: 2

SARDAR PATEL UNIVERSITY

S.Y. B.Sc.

Third Semester Examination, 2011

Friday, 18th November

10.30 a.m. to 12.30 p.m.

BIOCHEMISTRY: US03EBCH01

(FUNDAMENTALS OF BIOCHEMISTRY)

Total Marks:70

Note: Answers to all the questions (including multiple choice questions) should be written in the provided answer-book only

Q1. Choose the correct option & write it in the answer sheet:

[10]

- 1) In water molecule oxygen is _____
a) Electropositive b) Electronegative c) Neutral d) None of these
- 2) Hydrogen bond is _____ electrostatic
a) 60 % b) 70% c) 80% d) 90%
- 3) Non-Suprimposable mirror images of a compound are _____
a) Epimers b) Diastereomers c) Anomers d) Enantiomers
- 4) Storage carbohydrate in plants is _____
a) Starch b) Cellulose c) Glycogen d) Hemicellulose
- 5) The two units of Maltose are Glucose and _____
a) Glucose b) Fructose c) Galactose d) Raffinose
- 6) The three letter abbreviation "Asn" stands for _____
a) Alanine b) Aspartate c) Asparagine d) None of these
- 7) Isoelectric pH of Glycine is _____
a) 5.20 b) 5.00 c) 5.79 d) 5.97
- 8) Polymerisation of amino-acids results in _____
a) Lipids b) Carbohydrates c) Proteins d) Nucleic-acids
- 9) In the formula $F = w^2 r$, wheres r stands for _____
a) Radial velocity b) Radius of rotation c) Angular velocity d) Force
- 10) A solute with lowest affinity for mobile phase will move _____
a) Slowest b) Fastest c) Backward d) Not at all

Q2. Answer the following (any ten):

[20]

- 1) Discuss structure of water.
- 2) Write a short note on water intoxication.
- 3) Discuss role of Thirst mechanism in water regulation.
- 4) Define : (a) Asymmetric carbon (b) Epimers
- 5) Write Fischer projection & Haworth formula of β -L-glucopyranose.
- 6) Write biological importance of carbohydrates.
- 7) Discuss Optical-isomerism in Amino-acids.
- 8) How is Proline different from other amino-acids? Explain.
- 9) Give a brief note on Selenocysteine.
- 10) Briefly discuss Desk-top centrifuge.
- 11) Explain Ion-Exchange-Chromatography.
- 12) Write a short note on Partition-Coefficient.

Q3. (a) Give distribution of electrolytes in body.

[05]

(b) Explain Pure water Dehydration.

[05]

OR

Q3. (a) Discuss distribution of Water in body.

[05]

(b) Explain Pure salt depletion.

[05]

Q4. (a) Define carbohydrates and discuss classification of Carbohydrates.

[05]

(b) Explain Mutarotation in carbohydrates.

[05]

OR

Q4. (a) Define Homopolysaccharides and write a note on Cellulose.

[05]

(b) Discuss Isomerism in carbohydrates.

[05]

Q5. (a) Discuss Amphoteric nature and Isoelectric pH of amino acids.

[05]

(b) Discuss classification of amino-acids based on polarity.

[05]

OR

Q5. (a) Draw titration curve of Glycine and briefly give its summary.

[05]

(b) Draw structure of : Serine , Tryptophan , Histidine , Cysteine, Tyrosine.

[05]

Q6. (a) Give methodology and application of Thin-Layer Chromatography

[10]

OR

(b) Write a detailed note on Ultracentrifuge.

[10]

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(2)

SARDAR PATEL UNIVERSITY
S.Y. B.Sc. EXAMINATION
2011
Friday, 14th October
2.30 pm to 5.30 pm
BC - 201: BIOCHEMISTRY
(Introduction & Importance to Biomolecules)

Total Marks: 80

Note : (i) Figures to the right indicate marks.
(ii) Draw diagrams wherever necessary.

- Q.1 (a)** Write a short note on reducing action of sugars. (05)
(b) List the various functions of carbohydrates. (05)
(c) Define the following with suitable examples: (04)
(i) Heteropolysaccharides
(ii) Anomers

OR

- Q.1 (a)** Give an account on animal storage polysaccharide. (05)
(b) Explain the cyclization of monosaccharides. (05)
(c) Define the following with suitable examples: (04)
(i) Chiral carbon
(ii) Epimers

- Q.2 (a)** Discuss the classification of amino acids based on their structure. (07)
(b) Write short notes on following: (06)
(i) Essential amino acids
(ii) Amphoteric nature of proteins

OR

- Q.2 (a)** Write a detail account on primary structure of proteins. (07)
(b) Describe the precipitation of proteins. (06)

- Q.3 (a)** Explain the structure and properties of animal sterol. (05)
(b) Give an account on Glycolipids. (05)
(c) Draw the structure of following lipids: (03)
(i) Phosphatidyl choline (ii) Plasmalogen (iii) Triacylglycerol

OR

- Q.3 (a)** Explain properties of fatty acids. (05)
(b) Write a short note on Gangliosides. (05)
(c) "Lipids can serve as signals, cofactors and pigments." Justify the given statement. (03)

- Q.4 (a)** Explain the clover leaf model of RNA. (06)
(b) Describe the properties of DNA. (04)
(c) Define the following with suitable examples: (04)
(i) Gene (ii) Genetic code

OR

- Q.4 (a)** Give a detail account on B- form of DNA. (06)
(b) Prove DNA as a genetic material by Harshey – Chase experiment. (04)
(c) Define the following with suitable examples: (04)
(i) Plasmid (ii) Nucleotide

- Q.5 (a)** Discuss the dietary sources and importance of the following: (07)
(i) Iron (ii) Calcium
(b) Explain biochemical functions of Tocopherol. (06)

OR

- Q.5 (a)** Discuss the dietary sources and deficiency disorders of the following: (07)
(i) Ascorbic acid (ii) Vitamin D
(b) Explain biochemical functions of Sodium. (06)

- Q.6 (a)** Explain the metabolic functions of mitochondria. (06)
(b) Define the following with suitable examples: (04)
(i) Catabolism (ii) Cofactor
(c) "Living organisms are never at equilibrium with their surroundings." (03)
Justify the given statement.

OR

- Q.6 (a)** Discuss the metabolic functions of plasma membrane. (06)
(b) Explain the role of Acetyl CoA as the central molecule in the metabolism. (04)
(c) Describe the classification of enzymes. (03)



SARDAR PATEL UNIVERSITY
S.Y. B.Sc. EXAMINATION
2011
Tuesday, 18th October
2.30 pm to 5.30 pm
BC - 211: BIOCHEMISTRY
(Introduction & Importance of Biochemistry)

Note: Figures to the right indicates marks

Max.Marks:80

- Q1. (a) Explain the role of respiration in acid-base regulation. [07]**
(b) Describe the structure of water. [03]
(c) Give an account of distribution of body water. [03]

OR

- Q1. (a) Discuss Bicarbonate and Phosphate buffer systems. [07]**
(b) Derive H-H equation. [03]
(c) Explain different types of acidosis. [03]

- Q2. (a) What are polysaccharides ? Explain in detail structure and functions of starch. [07]**
(b) Write short notes on:
(i) Tests to check purity of oil [04]
(ii) Physical properties of fats [03]

OR

- Q2. (a) Write a detailed note on essential fatty acids. [07]**
(b) Discuss briefly:
(i) Mutarotation [04]
(ii) Amino sugars [03]

- Q3.(a) Discuss steps to determine amino acid sequence of a protein. [06]**
(b) Write brief notes on:
(i) Peptide bond [04]
(ii) Chargaff's rule [03]

OR

- Q3.(a) Write a detailed account on secondary structure of proteins. [06]**
(b) Discuss structure of tRNA. [04]
(c) Give a note on Pyrimidines. [03]

