

First Semester B.Sc., Degree Examinations

April / May 2022

(Semester Scheme) (New syllabus - 2017 -18 Onwards)

BIOCHEMISTRY**SSA 270: PAPER - I : BASIC PRINCIPLES OF BIOCHEMISTRY**

Time: 3hrs.]

[Max. Marks: 60

Instructions to the candidates:

1. This paper consists of FIVE sections.
Answer all sections
2. Sections A & B contain ONE mark questions and should be answered in the first two pages of the main answer book. The questions of section A and B answered in any other part of the answer book will not be valued.
3. Write equations and neat diagrams wherever necessary.

SECTION - A

Answer the following in a word, a phrase or in a sentence:

5 x 1 = 05 Marks

1. Define ionic product of water.
2. State Raoult's law.
3. Expand PPM.
4. What are bi functional compounds?
5. What are colloidal solutions?

SECTION - B**Multiple choice questions:**

Each one of the following questions is provided with four answers a, b, c and d. Choose the correct answer among them and write it along with the respective answer in the main answer book:

5 x 1 = 05 Marks

6. There are _____ covalent bonds in acetylene.
a) 05 b) 01 c) 04 d) 03
7. Which of the following is an isotope of iodine?
a) I^{146} b) I^{152} c) I^{131} d) I^{231}
8. An ion with positively charged carbon atom is called
a) carbanion b) carbocation c) carboposition d) All of these

Contd..... 2

9. 1, 3 – butadiene is a/an
- | | |
|-------------------|---------------------|
| a) Isolated diene | b) Cumulated diene |
| c) paratriene | d) conjugated diene |
10. An example for a dihydric alcohol is
- | | |
|---------------|-----------------|
| a) Catechol | b) Quinol |
| c) Resorcinol | d) All of these |

SECTION – C

Answer any FIVE of the following questions:

5 x 3 = 15 Marks

11. Explain the role of water as a solvent of life.
12. List out the characteristics of bonding.
13. How do you measure the osmotic pressure by Berkeley-Hartley method?
14. Enumerate any two properties each of α , β and γ particles.
15. Write the mechanism for the addition of bromine to 1,3-butadiene.
16. Explain the applications of emulsions in lipid chemistry.

SECTION – D

Answer any THREE of the following questions:

3 x 5 = 15 Marks

17. Explain the milestones and developments of Biochemistry.
18. Define elevation in boiling point. Explain the molecular weight determination using Walker-Lumsden method.
19. Explain the applications of C^{14} and P^{32} .
20. Outline the electronic interpretation for the orienting influence of substituents in the electrophilic substitution of toluene.

SECTION – E

Answer any TWO of the following questions:

2 x 10 = 20 Marks

21. a) Discuss Dissociation constants.
b) List the postulates of molecular orbital theory.
c) Explain precipitation and complexometric titrations with an example in each.

(3+3+4)

Contd..... 3

22. a) Natural and artificial radioactivity.
b) What are primary and secondary standards? Give examples.
c) Explain the estimation of sulphur by Carius method. (2+3+3+2)
d) Write the structure and IUPAC name of Glycerol.
23. a) With an example explain how ozonolysis and oxidation are used to detect the position of double bonds.
b) How is glycerol synthesized from propene?
c) Define Tyndall effect. (5+3+1+1)
d) What is Aromaticity?

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First Semester B.Sc., Degree Examinations

April / May 2022

(Semester Scheme) (Old syllabus)

BIOCHEMISTRY**SSA 270: PAPER – I : BASIC PRINCIPLES OF BIOCHEMISTRY**

Time: 3hrs.]

[Max. Marks: 60

Instructions to the candidates:

1. This paper consists of FIVE sections.
Answer all sections
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3. Write equations and neat diagrams wherever necessary.

SECTION – A

Answer the following in a word, a phrase or in a sentence:

5 x 1 = 05 Marks

1. Give an example for electron donating group.
2. Name any one polymer.
3. Give an example for isolated diene.
4. Write the E.C. of Oxygen.
5. Write the structure of Naphthalene.

SECTION – B**Multiple choice questions:**

Each one of the following questions is provided with four answers a, b, c and d. Choose the correct answer among them and write it along with the respective answer in the main answer book:

5 x 1 = 05 Marks

6. Toluene on Nitration gives.
a) m-nitrotoluene b) Dinitrotoluene c) 2, 4, 6 TNT d) 1,3,5TNT
7. How many electrons are present in K-shell?
a) One b) Two c) Three d) Four
8. Example for emulsion is
a) Oil in H₂O b) Water in oil c) Milk d) Sugar solution

Contd..... 5

9. Nitro group NO_2^+ is
- Electrophile
 - Electron withdrawing group
 - Meta directing
 - All are correct
10. In the conversion of Ethyl bromide into ethylene with respect to bond the process is _____
- Sigma to Pi
 - Pi to Sigma
 - Sigma to Sigma
 - None

SECTION - C

5 x 3 = 15 Marks

Answer any FIVE of the following questions:

- List out the applications of Colloids.
- Define a) Inductive effect b) Ionization energy c) Colloids
- Write a note on carbon cations.
- State the laws of photochemistry.
- Explain the effect of concentration (C) and temperature (T) on osmotic pressure
- Describe the mechanism of alkylation of C_6H_6

SECTION - D

3 x 5 = 15 Marks

Answer any THREE of the following questions:

- What is S_N reaction? Give example.
 - Explain the formation, geometry of carbon free radical. 2+3
- Discuss types of adsorptions.
 - What is the role of con. H_2SO_4 in Nitration? 4+1
- Explain the addition of HBr on propene in absence of peroxide.
 - What is Einstein? 4+1
- What is Ozonolysis? Apply Ozonolysis to distinguish 1-butene and 2-butane.
 - What is photochemical reactions? 4+1

SECTION - E

2 x 10 = 20 Marks

Answer any TWO of the following questions:

- Write a note on Hyperconjugation.
 - Explain the significance of four quantum numbers.
 - Compare Fluorescence and phosphorescence (3+4+3)

Contd..... 6

22. a) Discuss the determination of Osmotic pressure of solution by Berkley Hartley method.
- b) Explain types of covalent bonds.
- c) Write a note on halogens and its importance's. (4+3+3)
23. a) Outline the determination of molecular weight of polymer by light scattering technique.
- b) State modern periodic law.
- c) Explain the classification of element in periodic table.
- d) Write a note on Carius method. (4+1+3+2)

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Second Semester B.Sc., Degree Examinations
SEPTEMBER/OCTOBER 2022

(NEP Syllabus)

PAPER II: CHEMICAL FOUNDATIONS OF BIOCHEMISTRY - II

Time: 2 hrs]

[Max. Marks: 60

Answer all the questions:

SECTION - A

1. Select the most appropriate answer from the options provided: 10 × 1 = 10

- a) The catalysts work by
- a) Increasing the activation energy b) Decreasing the activation energy
c) Increasing the reaction temperature d) Decreasing the reaction temperature
- b) Milk is an example of
- a) Solid sol b) Gel c) Emulsion d) True solution
- c) How many functional groups are there in 1, 3 – dihydroxy butane?
- a) 1 b) 2 c) 3 d) None
- d) d-tartaric acid has _____ chiral carbon.
- a) 1 b) 2 c) 3 d) 4
- e) The metal ion in carbonic anhydrase is
- a) Iron b) Nickel c) Phosphorous d) zinc
- f) The general formula of Grignard reagents is
- a) RX b) RMX c) RMgX d) MgX
- g) The name of $FeCl_3$ salt is _____
- a) Iron (III) chloride b) Iron (II) chloride
c) Ferrous chloride d) Ferro chloride

Contd..... 2

- h) Minamata disease is caused due to
a) Lead poisoning b) Arsenic poisoning
c) Mercury poisoning d) All of the above
- i) Myoglobin is a
a) Protein b) Protease c) Nuclease d) All of these
- j) Respiration is a/an
a) Redox reaction b) Isomerization reaction
c) Addition reaction d) Substitution reaction

SECTION - B

Answer any FIVE of the following:

5 × 3 = 15

2. Give the characteristics of enzyme catalysis.
3. What are emulsions? Mention their types with suitable examples.
4. Write a note on geometrical isomerism in organic compounds.
5. Give role of stereochemistry in biological systems.
6. Write any one method of preparation and reaction of organolithium compounds.
7. Enumerate the role of copper in hemocyanin and magnesium in chlorophyll.
8. Explain the geometrical isomerism in inorganic complexes.
9. Define free radicals. How are they generated?

SECTION - C

Answer any THREE of the following:

3 × 5 = 15

10. Write a note on Hg poisoning.
11. Explain the structural isomerism in organic compounds.
12. Explain the preparation, reactions and limitations of Grignard reagents.
13. Enumerate the applications of inorganic complexes in qualitative and quantitative analysis.
14. a) What are endergonic and exergonic reactions? Give an example.
b) What are stock notations?

(4 + 1)

Contd..... 3

SECTION - D

Answer the following:

 $2 \times 10 = 20$

15. a) i) Explain the theories of catalysis.
ii) Explain Kinetic and electrical properties of colloids.
iii) What are micelles? Write their biological importance. (4 + 4 + 2)

OR

- b) i) Explain optical isomerism in organic compounds.
ii) Define the terms: enantiomers, epimers and racemic mixture.
iii) Write the CIP rules for absolute configuration. (3 + 3 + 4)

16. a) i) Explain the preparation and reactions of organozinc compounds.
ii) Describe the transition metal ions and their oxidation states in biological systems.
iii) What are ferrocenes? (4 + 4 + 2)

OR

- b) i) What are homoleptic and heteroleptic complexes? Give an example.
ii) Explain the optical isomerism in inorganic complexes with an example.
iii) Write the hazardous effects of CO_2 , SO_2 , NO_2 and acid fumes. (3 + 3 + 4)

Third Semester B.Sc., Degree Examinations

April / May 2022

(Semester Scheme) (2017-18 Onwards) (New syllabus)

BIOCHEMISTRY**SSC 270: PAPER - III: BIOMOLECULES**

Time: 3hrs.]

[Max. Marks: 60

Instructions to the candidates:

- 1. This paper consists of FIVE sections.
Answer all sections**
- 2. Sections A & B contain ONE mark questions and should be answered in the first two pages of the main answer book. The questions of section A and B answered in any other part of the answer book will not be valued.**
- 3. Write equations and neat diagram wherever necessary.**

SECTION - A*Answer the following in a word, a phrase or in a sentence:*

5 x 1 = 05 Marks

1. Name the amino acid which contain imidazole ring.
2. What are epimers?
3. What is significance of saponification number ?
4. Write the components of a nucleotide.
5. What is chemotherapy?

SECTION - B*Each one of the following questions is provided with four answers a, b, c and d. Choose the correct answer among them and write it along with the respective answer in the main answer book:*

5 x 1 = 05 Marks

6. LSD is an
a) Alkaloid b) Steroid c) Terpene d) None of these.
7. The monomers present in cellulose are
a) Alpha glucose b) Fructose c) Beta glucose d) None of them
8. Which form of DNA found in living organisms
a) B - DNA b) A- DNA c) Z-DNA d) None of these.

Contd..... 2

9. Example for structural polysaccharide
 a) Glycogen b) Starch c) Glucose d) None
10. Which of the following is not an antibiotic?
 a) tetracycline b) penicillin c) aspirin d) Chloramphenicol

SECTION - C

Answer any FIVE of the following questions:

5 x 3 = 15 Marks

11. What are heteropolysaccharides? Add a note on their functions.
12. What are essential and non - essential amino acids? Give example
13. Brief on importance of prostaglandins.
14. Discuss the physical properties of DNA.
15. Write the synthesis of aspirin from salicylic acid. Add a note on their uses.
16. Explain basicity of pyrrole and pyridine.

SECTION - D

Answer any THREE of the following questions:

3 x 5 = 15 Marks

17. Discuss the structure, chemistry and functions of sucrose and cellulose.
18. Explain the fluid mosaic model of cell membrane and its importance.
19. a) Discuss the biological functions of glutathione.
 b) How nucleic acids are isolated? (2+3)
20. a) Explain primary, secondary and tertiary structure of proteins,
 b) State isoprene rule. (4+1)

SECTION - E

Answer any TWO of the following questions:

2 x 10 = 20 Marks

21. a) Explain biological importance of amino sugars, sugar acids and deoxy sugars
 b) Write any two general reactions of amino acids.
 c) Write the structure of atropine, cellobiose and citral
 d) What do mean by Zwitter ionic state of an amino acid ? (3+3+3+1=10 Marks)
22. a) Discuss Watson -Crick model of DNA.
 b) What are lipids? Write a note on lipoproteins.
 c) What are antibiotics? Give example.
 d) What are Anomers? (4+3+2+1=10 Marks)

Contd..... 3

23. a) Discuss on the structural elucidation of nicotine.
b) Explain the biological roles of different types of RNA.
c) Brief about the importance of mucopolysaccharides
d) Write the biological importance of carbohydrates?

(4+3+2+1=10 Marks)

Contd..... 4

Third Semester B.Sc., Degree Examinations
April / May 2022

(Semester Scheme) (Old syllabus)

BIOCHEMISTRY

SSC 270: PAPER – III: BASIC PRINCIPLES OF BIOCHEMISTRY

Time: 3hrs.]

[Max. Marks: 60

Instructions to the candidates:

1. This paper consists of FIVE sections.
Answer all sections
2. Sections A & B contain ONE mark questions and should be answered in the first two pages of the main answer book. The questions of section A and B answered in any other part of the answer book will not be valued.
3. Write equations and neat diagram wherever necessary.

SECTION – A

Answer the following in a word, a phrase or in a sentence:

5 x 1 = 05 Marks

1. Name any one green house gas.
2. What is co-ordination number ?
3. Which metal is present in Vitamin – B₁₂ ?
4. What is Chromatography ?
5. Give an example for keto acid.

SECTION – B

Each one of the following questions is provided with four answers a, b, c and d. Choose the correct answer among them and write it along with the respective answer in the main answer book:

5 x 1 = 05 Marks

6. D(+) glyceraldehydes is
 a) Mesomeric isomer b) Geometric isomer c) Optical isomer d) None
7. Glutaric acid is
 a) acid b) dicarboxylic acid c) Aliphatic d) All are correct
8. Which of the following is used to distinguish amines
 a) HNO₃ b) H₂SO₄ c) HNO₂ d) All of these

Contd..... 5

9. LSD is
 a) Terpene b) Drug c) Alkaloid d) Carbohydrate
10. Example for pesticide is
 a) Malathion b) 2,4 D c) 2,4,5 - T d) All are correct

SECTION - C

Answer any FIVE of the following questions:

5 x 3 = 15 Marks

11. Explain synthesis of sulfanilamide.
12. Discuss the aromaticity of Furan.
13. Write a note on classification of terpenes.
14. Explain the basicity of 1° , 2° and 3° amines.
15. Describe the mechanism of aldol condensation.
16. How the radioactive wastes are disposed to environment?

SECTION - D

Answer any THREE of the following questions:

3 x 5 = 15 Marks

17. a) Explain the concept of D, L, (+) and (-) with suitable example.
 b) What is racemization? 4+1
18. a) Explain the effect of heat on dicarboxylic acids with equations.
 b) Write the structure of citric acid. 4+1
19. a) Write a note on Quinones.
 b) Define BOD and COD. 2+2
20. What are Ligands? How are they classified? Explain with suitable examples.

SECTION - E

Answer any TWO of the following questions:

2 x 10 = 20 Marks

21. a) Outline assumption of Crystal field theory in Octahedral complex.
 b) What are air pollutants? Explain the effects of SO_x and NO_x on human body.
 c) Write the principles of paper chromatography. (4+4+2)
22. a) State isoprene rule.
 b) Write the structure and biological importance's of Cholesterol and gibberellic acids.
 c) Outline the general characteristic properties of alkaloids. (1+6+3)

Contd..... 6

23. a) What are amines? How will you distinguish primary, secondary and tertiary amines using nitrous acid?
- b) Write a note on geometrical isomerism.
- c) Explain the mechanism of addition of HCN on acetaldehyde. (5+3+2)

8. Streptomycin inhibits protein synthesis by,
- Causing misreading of m RNA
 - Mimicking the charged t – RNA
 - By binding to DNA
 - None of these
9. Purpose of the use of formaldehyde in northern blotting is
- To remove the secondary structures of DNA
 - To remove the secondary structures of RNA
 - To fragment the RNA strands
 - To fragment the DNA strands
10. cDNA is synthesized from _____
- | | |
|---------------------|---------|
| a) Any DNA molecule | b) mRNA |
| c) tRNA | d) rRNA |

SECTION – C

Answer any FIVE of the following questions:

5 x 3 = 15

- Write on Hershey – Chase experiment.
- Brief on recombination mapping.
- Brief on RNA polymerase and initiation of translation.
- Explain the type II restriction endonucleases.
- Describe Wobble hypothesis.
- Expand pBR322. Mention its advantages.

SECTION – D

Answer any THREE of the following questions:

3 x 5 = 15

- Explain lagging strand synthesis in replication.
 - What is euploidy?
- Discuss the Mendel's laws of inheritance.
 - What is RNA replicase?
- Explain the regulation of lac operon.
 - Define gene silencing.
- How is insulin produced by rDNA technology?

Contd..... 3

SECTION - E

2 x 10 = 20

Answer any TWO of the following questions:

21. a) Brief on DNA repair mechanism. (6 + 4)
b) Explain the initiation and elongation steps of protein synthesis.
22. a) Write on phage vectors. (4 + 4 + 2)
b) Outline the construction of genomic library and its applications.
c) Brief on electroporation.
23. a) Briefly explain western blotting. (3 + 4 + 3)
b) Explain in detail the principle, methodology and applications of PCR.
c) Write the applications of r-DNA technology in medicine.

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Fifth Semester B.Sc., Degree Examinations**April / May 2022***(Semester Scheme) (New syllabus) (2017-18 Onwards)***BIOCHEMISTRY****SSE 271: PAPER – VI: MOLECULAR BIOLOGY AND RECOMBINANT DNA TECHNOLOGY**

Time: 3hrs.]

[Max. Marks: 60

Instructions to the candidates:

1. This paper consists of FIVE sections.
Answer all sections
2. Sections A & B contain ONE mark questions and should be answered in the first two pages of the main answer book. The questions of section A and B answered in any other part of the answer book will not be valued.
3. Write equations and neat diagrams wherever necessary.

SECTION – A

I. Answer the following in a word, a phrase or in a sentence: 5 x 1 = 05 Marks

1. Give an example for incomplete dominance.
2. Mention termination codons.
3. Mention any two milestone in the history of r-DNA technology.
4. What are primers ?
5. Name the inducer of lac operon.

SECTION – B

II. Each one of the following questions is provided with four answers a, b, c and d. Choose the correct answer among them and write it along with the respective answers in the main answer book:

5 x 1 = 05 Marks

6. Which of the following is an example for phage vectors?
 - a) P^{BR322}
 - b) λ gt 10
 - c) pJB
 - d) None
7. Sense strand of DNA is
 - a) Same as mRNA, except U of RNA is replaced by T
 - b) Also called coding strand
 - c) Not a template
 - d) All of these

Contd..... 2

8. 21 – trisomy in humans is associated with
- a) Cri – du – chat syndrome b) Down's syndrome
c) Turnover Syndrome d) Klinefelle'r syndrome
9. 3' tail of mRNA is added by
- a) Adenylyl Transferase b) Polyadenylyl polymerase
c) Capping enzyme d) RNA phosphatase
10. Which of the following activities are exhibited by reverse transcriptase
- a) Synthesise DNA using RNA as template b) Synthesise DNA using DNA as template
c) Degrades RNA in a RNA – DNA hybrid d) All of these

SECTION – C

III. Answer any FIVE of the following questions: 5 x 3 = 15 Marks

11. Discuss Mendel's law of independent assortment with suitable example.
12. Explain the events of initiation of transcription.
13. Write a note on P^{BR322} .
14. Briefly explain any two DNA repair mechanism.
15. Discuss the inhibitors involved in protein synthesis.
16. Give the general principles involved in isolation of DNA from living cell.

SECTION – D

IV. Answer any THREE of the following questions: 3 x 5 = 15 Marks

17. a) Discuss the different types of chromosomal Aberrations.
b) What is genomic library? 4+1
18. a) Explain the regulation of gene expression by taking Tryptophan operon as an example.
c) What is c-DNA? 4+1
19. Explain the steps involved in the construction of chimeric DNA. 5
20. a) Explain the experiment which proved semi conservative mode of DNA replication.
b) Write a short note on RNA replicase. 3+2

Contd..... 3

SECTION - E

V. *Answer any TWO of the following questions:*

2 x 10 = 20 Marks

21. a) Discuss the events taking place in semi conservative DNA replication.
b) What are restriction endonucleases? Describe their types and nomenclature. (6+4)
22. a) Explain the principle, procedure and applications of PCR.
b) Elaborate the elongation and termination steps of protein synthesis. (4+6)
23. a) In detail explain site directed mutagenesis and its applications.
b) Discuss the applications of r - DNA technology in medicine. (4+6)

Contd..... 4

Fifth Semester B.Sc., Degree Examinations
April / May 2022

(Semester Scheme) (Old syllabus) (Before 2017)

BIOCHEMISTRY

**SSE 271: PAPER - VI: MOLECULAR BIOLOGY AND
RECOMBINANT DNA TECHNOLOGY**

Time: 3hrs.]

[Max. Marks: 60

Instructions to the candidates:

- 1. This paper consists of FIVE sections.
Answer all sections**
- 2. Sections A & B contain ONE mark questions and should
be answered in the first two pages of the main answer
book. The questions of section A and B answered in any
other part of the answer book will not be valued.**
- 3. Write equations and neat diagrams wherever necessary.**

SECTION - A

- I. Answer the following in a word, a phrase or in a sentence: 5 x 1 = 05 Marks
1. What is DNase ?
 2. What is replication fork ?
 3. Mention the enzymes used in r - DNA technology.
 4. What are probes ?
 5. Give example for any two host cells.

SECTION - B

- II. Each one of the following questions is provided with four answers a, b, c and d.
Choose the correct answer among them and write it along with the respective
answers in the main answer book: 5 x 1 = 05 Marks

6. Two DNA fragments can be joined by
a) Restriction endo nucleases b) DNA ligase
c) Phosphatase d) DNase
7. Which of the following is not a post translational modification ?
a) Phosphorylation b) Glycosylation
c) Methylation d) None of these

Contd..... 5

23. a) Explain the principle, procedure and applications of PCR.
b) Discuss the work of Nirenberg and Khorana in deciphering the genetic code.

(4+6)

Fifth Semester B.Sc., Degree Examinations**April / May 2022***(Semester Scheme) (New syllabus) (2017-18 Onwards)***BIOCHEMISTRY****SSE 270: PAPER - V: BIOANALYTICAL TECHNIQUES****ENVIRONMENTAL BIOCHEMISTRY AND BIOINFORMATICS**

Time: 3hrs.]

[Max. Marks: 60

Instructions to the candidates:

- 1. This paper consists of FIVE sections. Answer all sections**
- 2. Sections A & B contain ONE mark questions and should be answered in the first two pages of the main answer book. The questions of section A and B answered in any other part of the answer book will not be valued.**
- 3. Write equations and neat diagrams wherever necessary.**

SECTION - A*Answer the following in a word, a phrase or in a sentence:*

5 x 1 = 05 Marks

1. Write the scope of isolation of biomolecules
2. Expand HPLC.
3. Define Svedberg unit.
4. What is Standard Deviation ?
5. What is a Data Base?

SECTION - B*Multiple choice questions:**Each one of the following questions is provided with four answers a, b, c and d. Choose the correct answer among them and write it along with the respective answers in the main answer book:*

5 x 1 = 05 Marks

6. The common solvent used for the protein precipitation is

a) Benzene	b) Acetone
c) Toluene	d) Chloroform

Contd.....2

7. Which among the following is an anion exchanger ?
 a) Carboxy methyl cellulose b) DEAE cellulose
 c) Methyl sulfonate cellulose d) All of the above
8. Intensity of scattered light is measured in
 a) Nephelometry b) Turbidometry
 c) Colorimeter d) Fluorimetry
9. How do moderate radioactive solid wastes are disposed ?
 a) Buried underground b) Buried under sea
 c) Sent to outer space d) Leftout in the streams of rivers
10. Which of the following is an insecticide ?
 a) 2, 4, D b) 2, 4, S
 c) Malathion d) All of the above

SECTION - C

Answer any FIVE of the following questions:

5 x 3 = 15 Marks

11. Give the outline of the strategy of biomolecule isolation.
 12. Briefly write the principle of NMR.
 13. Discuss the biochemical effects of lead.
 14. Write the principle and applications of affinity chromatography.
 15. Calculate the standard error of mean of the following 20,40,60,80,100.
 16. Write the applications of bioinformatics.

SECTION - D

Answer any THREE of the following questions:

3 x 5 = 15 Marks

17. a) Discuss the principle and applications of SDS - PAGE
 b) Write any one application of isoelectric focusing. (4+1)
 18. Describe the principle, procedure and applications of isopycnic centrifugation.
 19. Discuss any two primary sequencing data base.
 20. Explain the principle, procedure and applications of gel permeation chromatography.

SECTION - E

Answer any TWO of the following questions:

2 x 10 = 20 Marks

21. a) Calculate the mean and median for the following data.

Weight	46	48	50	52	53	54
No. of sheep	7	5	8	12	10	2

Contd..... 3

- b) Explain the principle and applications of uv-visible spectrophotometer. (5+5)
22. a) Discuss the pollution caused by the oxides of N₂.
b) Explain primary sewage treatment of effluents. (4+4+2)
c) Explain lyophilization
23. a) Describe different types of tabulation and diagrammatic representation of data. (4 + 6)
b) Write a note on human genome project.

Contd..... 4

Fifth Semester B.Sc., Degree Examinations**April / May 2022***(Semester Scheme) (Old syllabus)***BIOCHEMISTRY****SSE 270: PAPER – V: BIOMOLECULES**

Time: 3hrs.]

[Max. Marks: 60

Instructions to the candidates:

- 1. This paper consists of FIVE sections.
Answer all sections**
- 2. Sections A & B contain ONE mark questions and should be answered in the first two pages of the main answer book. The questions of section A and B answered in any other part of the answer book will not be valued.**
- 3. Write equations and neat diagrams wherever necessary.**

SECTION – A*Answer the following in a word, a phrase or in a sentence:*

5 x 1 = 05 Marks

1. Define Anomers.
2. Write the structure of non-polar amino acid.
3. Mention the biological importance of lipoprotein.
4. Write the significance of V_{max} .
5. Expand ATCase.

SECTION – B**Multiple choice questions:***Each one of the following questions is provided with four answers a, b, c and d. Choose the correct answer among them and write it along with the respective answers in the main answer book:*

5 x 1 = 05 Marks

6. Structural polysaccharides include,
a) Cellulose, hemicellulose and chitin b) Cellulose, starch and chitin
c) cellulose, starch and glycogen d) cellulose, glycogen and chitin
7. Amino acid with sulphur group is,
a) Serine and alanine b) alanine and valine
c) Methionine and cysteine d) valine and isoleucine

Contd..... 5

8. The primary structure of protein represents,
- Linear sequence of amino acids joined by peptide bond
 - 3-dimensional structure of protein
 - Helical structure of protein
 - Subunit structure of protein
9. Hydrolysis of fats by alkali into fatty acids and glycerol is called as,
- Coagulation
 - saponification
 - suspension
 - colloidal
10. Name the nucleic acid which is right-handed,
- mRNA
 - tRNA
 - A- DNA
 - B - DNA

SECTION - C

Answer any **FIVE** of the following questions:

5 x 3 = 15 Marks

- Define nonstandard and non-protein amino acids. Give an example for each.
- Brief on peptidoglycans.
- What are Immobilized enzymes? Write its applications.
- Write the importance of waxes.
- Outline the structure of tRNA.
- Write the importance of glutathione.

SECTION - D

Answer any **THREE** of the following questions:

3 x 5 = 15 Marks

- Give a detailed account on factors affecting rate of enzyme catalyzed reaction.
- Explain in detail the structure and biological role of Watson and Crick model of DNA.
- Describe in detail the behavior of amphipathic lipids in water.
- Give a detailed account on classification of carbohydrates based on hydrolysis.

SECTION - E

Answer any **TWO** of the following questions:

2 x 10 = 20 Marks

- How aldose and ketoses are inter converted?
 - Give an account on titration curve of amino acids.
 - Write on fluid mosaic model.

(4+3+3)

Contd..... 6

22. Write on,

- a) Classification of proteins based on shape
- b) Glycosidic linkage with suitable example.
- c) Abzymes

(4+5+1)

23. a) Describe in detail the types of inhibition.

- b) Give a detailed account on structural organization of proteins

(5 + 5)

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Sixth Semester B.Sc., Degree Examinations**SEPTEMBER/OCTOBER 2022***(Semester Scheme) (2017 – 18 onwards new syllabus)***BIOCHEMISTRY****SSF 271: PAPER – VIII: IMMUNOLOGY AND CLINICAL
BIOCHEMISTRY**

Time: 3hrs.]

[Max. Marks: 60

Instructions to the candidates:

1. This paper consists of FIVE sections. Answer all sections
2. Section A & B contain ONE mark questions and should be answered in the first two pages of the main answer book. The questions of section A and B answered in any other part of the answer book will not be valued.
3. Write equations and neat diagram wherever necessary.

SECTION – A*Answer the following in a word, a phrase or in a sentence:*

5 x 1 = 05 Marks

1. Write the function of cytokines.
2. What are abzymes?
3. Expand MHC.
4. What is immunogenicity?
5. Define Accuracy.

SECTION – B**Multiple choice questions:***Each one of the following questions is provided with four answers a, b, c and d. Choose the correct answer among them and write it along with the respective answers in the main answer book:*

5 x 1 = 05 Marks

6. Name the first cell which recruited at the place of infection.
 - a) NK Cells
 - b) Neutrophil
 - c) Basophil
 - d) Macrophage
7. Which of the following substances will not stimulate an immune response unless they are bound to a larger molecule?
 - a) Antigen
 - b) Virus
 - c) Hapten
 - d) Antibody

Contd..... 2

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22. Write on,

- a) Complement activation
- b) Hypersensitivity type – IV.
- c) Immunosuppressive drugs.

(4 + 3 + 3)

23. Write on,

- a) Glucose tolerance test
- b) Atherosclerosis
- b) Renal function test

(3 + 3 + 4)

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Sixth Semester B.Sc., Degree Examinations**April / May 2022***(Semester Scheme) (2017-18 Onwards) (New syllabus)***BIOCHEMISTRY****SSF 271: PAPER – VIII: IMMUNOLOGY & CLINICAL BIOCHEMISTRY**

Time: 3hrs.]

[Max. Marks: 60

Instructions to the candidates:

1. This paper consists of FIVE sections.
Answer all sections
2. Sections A & B contain ONE mark questions and should be answered in the first two pages of the main answer book. The questions of section A and B answered in any other part of the answer book will not be valued.
3. Write equations and neat diagrams wherever necessary.

SECTION – A*Answer the following in a word, a phrase or in a sentence:*

5 x 1 = 05 Marks

1. What are Haptens?
2. What are immunogens?
3. Expand SGPT.
4. What is ketosis?
5. Mention the function of abzymes?

SECTION – B**Multiple choice questions:***Each one of the following questions is provided with four answers a, b, c and d. Choose the correct answer among them and write it along with the respective answers in the main answer book:*

5 x 1 = 05 Marks

6. The enzyme level decreases due to organ phosphorous poisoning
a) Amylase b) LDH c) SGOT d) Creatinine kinase
7. The antibody present in higher percentage in serum is
a) IgA b) IgM c) IgG d) IgE
8. Elevated serum unconjugated bilirubin indicates _____ type of jaundice.
a) Hepatics b) Hemolytic c) Obstructive d) None of them

Contd..... 2

9. CD 4+ cells are a type of
 a) B cells b) Macrophages c) T cells d) Both a & c
10. Smallpox vaccine is which type of vaccine
 a) live attenuated b) inactivated c) Subunit d) None of these

SECTION – C

Answer any FIVE of the following questions:

5 x 3 = 15 Marks

11. Explain why blood and urine is considered as biological fluids for diagnosis.
12. Differentiate between cellular and humoral immunity.
13. Brief on Oral GTT.
14. Give the importance of cytokines.
15. Differentiate between phenylketonuria and alkaoptunuria.
16. Explain the important functions of IgG and IgE.

SECTION – D

Answer any THREE of the following questions:

3 x 5 = 15 Marks

17. What are hypersensitivity reactions ? Explain the mechanism of antibody mediated hypersensitivity reaction.
18. Discuss the biochemical changes observed during Diabetes Mellitus.
19. Discuss the principle, procedure and applications of ELISA.
20. a) What are Subunit vaccines? Give an example.
 b) Write a note on functions of complement system.

(2+3)

SECTION – E

Answer any TWO of the following questions:

2 x 10 = 20 Marks

21. a) Explain the activation of T cells.
 b) Write the clinical significance of Creatinine kinase and Lipase.
 c) What are non- functional plasma enzymes? Give an example
 d) Define precision.
22. a) Discuss hemolytic jaundice.
 b) Explain endocytic pathway of processing and presentation of antigen.
 c) Explain urea clearance test.

(3+4+2+1=10 Marks)

(3+3+4=10 Marks)

Contd..... 3

23. a) Explain the components and their significance of anatomical barriers in innate immunity.
- b) What is graft rejection?
- c) Describe the internal quality control features to assess the diagnostic procedure.
- d) Write the applications of monoclonal antibodies. (3+1+4+2=10 Marks)

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Contd..... 4

Sixth Semester B.Sc., Degree Examinations

April / May 2022

(Semester Scheme) (Old syllabus)

BIOCHEMISTRY**SSF 271: PAPER - VIII: CLINICAL BIOCHEMISTRY AND IMMUNOLOGY**

Time: 3hrs.]

[Max. Marks: 60

Instructions to the candidates:

1. This paper consists of FIVE sections. Answer all sections
2. Sections A & B contain ONE mark questions and should be answered in the first two pages of the main answer book. The questions of section A and B answered in any other part of the answer book will not be valued.
3. Write equations and neat diagrams wherever necessary.

SECTION - A

Answer the following in a word, a phrase or in a sentence:

5 x 1 = 05 Marks

1. Define oncogenes.
2. What are antigens?
3. Expand LDH.
4. Define Allograft.
5. What is paratope?

SECTION - B**Multiple choice questions:**

Each one of the following questions is provided with four answers a, b, c and d. Choose the correct answer among them and write it along with the respective answers in the main answer book:

5 x 1 = 05 Marks

6. Increase serum amylase and lipase level indicates
 - a) Hepatitis
 - b) pancreatitis
 - c) myocardial infraction
 - d) All of them
7. The antibody involved in type 1 hypersensitivity reactions is
 - a) IgA
 - b) IgM
 - c) IgG
 - d) IgE
8. CD8 + cells does not recognize the antigen present on MHC of cells
 - a) RBCs
 - b) WBCs
 - c) Nucleated cells
 - d) None of them
9. Humoral immunity is mediated by
 - a) B cells
 - b) Macrophages
 - c) Phagocytes
 - d) Both a & b

Contd... 5

10. Bilirubin is not excreted in urine in
 a) Obstructive Jaundice b) Hemolytic jaundice c) Hepatic jaundice d) All of these

SECTION - C

5 x 3 = 15 Marks

Answer any FIVE of the following questions:

11. Explain the importance of blood and urine sample collection in clinical diagnosis
12. Differentiate active and passive immunity with example.
13. Brief on clinical aspects of insulin independent Diabetes Mellitus.
14. Give the characteristic features of clonal selection theory.
15. Write the neat diagram of IgG and explain.
16. Explain Alkaptunuria.

SECTION - D

3 x 5 = 15 Marks

Answer any THREE of the following questions:

17. Detail on Gell and Coombs classification of hypersensitivity reactions and explain mechanism of type I hypersensitivity reaction.
18. Discuss the biochemical and metabolic changes observed during Diabetes Mellitus.
19. Write the principle, procedure and applications of RIA.
20. What are renal functional tests? Explain Urea Clearance test to assess the kidney function. (2+3)

SECTION - E

Answer any TWO of the following questions:

2 x 10 = 20 Marks

21. a) Explain the structure of THYMUS with a neat diagram. Add a note on their functions.
 b) Write the clinical significance of SGOT and Lipase.
 c) What are heat killed vaccines? Give examples. (4+4+2=10)
22. a) Discuss the types of Jaundice.
 b) What are non functional plasma enzymes? Give example.
 c) Explain Hypercholesterolemia. (4+3+3=10)
23. a) Define MHC. State the importance of MHC - 1 in graft rejection.
 b) What are immunosuppressive drugs?
 c) Describe the internal and external quality control features to assess the diagnostic procedure. (4+2+4=10 Marks)

Sixth Semester B.Sc., Degree Examinations
SEPTEMBER/OCTOBER 2022

(Semester Scheme) (2017 - 18 onwards new syllabus)

BIOCHEMISTRY

**SSF 270: PAPER - VII: ENZYMOLOGY
AND INTERMEDIARY METABOLISM**

Time: 3 hrs.]

[Max. Marks: 60

Instructions to the candidates:

1. This paper consists of FIVE sections. Answer all sections
2. Section A & B contain ONE mark questions and should be answered in the first two pages of the main answer book. The questions of section A and B answered in any other part of the answer book will not be valued.
3. Write equations and neat diagram wherever necessary.

SECTION - A

Answer the following in a word, a phrase or in a sentence:

5 x 1 = 05

1. Define apoenzyme.
2. Mention any two modes of regulation of metabolic pathways.
3. State II law of thermodynamics.
4. Write the commercial uses of chymotrypsin.
5. Name the precursors for gluconeogenesis.

SECTION - B

Multiple choice questions:

Each one of the following questions is provided with four answers a, b, c and d. Choose the correct answer among them and write it along with the respective answers in the main answer book:

5 x 1 = 05

6. To reduce photorespiration and save water the initial fixation of CO₂ in CAM plants.
 - a) Take place directly into Calvin cycle
 - b) Separated from Calvin cycle with respect to space
 - c) Separated from Calvin cycle with respect to time between day and night
 - d) All of these

Contd..... 2

7. In enzyme catalysed reaction, activation energy.
 - a) Increases
 - b) Decreases
 - c) Remains same
 - d) They are independent of activation energy

8. Glycogen phosphorylase catalysis the conversion of glycogen to
 - a) Glucose
 - b) Glucose 6 phosphate
 - c) Glucose 1 phosphate
 - d) Small chains of glucose

9. For any spontaneous reaction ΔG is
 - a) Positive
 - b) Negative
 - c) Equal to ΔG^{01}
 - d) None of these

10. Example for allosteric enzyme is
 - a) Amylase
 - b) LDH
 - c) Pyruvate DH
 - d) AT case

SECTION - C

Answer any FIVE of the following questions:

5 x 3 = 15

11. Write a note on the specificity of enzymes.
12. Write Lineweaver-Burk equation and plot. What are the advantages and disadvantages of LB plot.
13. Outline the synthesis of mevalonate from acetyl COA in cholesterol biosynthesis.
14. Briefly describe protein turnover.
15. Explain C_4 pathway.
16. Discuss chemiosmotic theory.

SECTION - D

Answer any THREE of the following questions:

3 x 5 = 15

17. Derive Michaelis-Menten equation. Write the significance of K_m and V_{max} .
18. a) Outline the biosynthesis of glycogen.
 b) Give an example for decarboxylation reaction. (4 + 1)
19. Schematically explain the reduction of O_2 to H_2O through ETC.
20. What is enzyme inhibition? Brief on different types of enzyme inhibition mechanisms.

Contd..... 3

SECTION - E

Answer any TWO of the following questions:

2 x 10 = 20

21. a) Explain the oxidation of acetyl COA to CO_2 via Kreb's cycle.
b) Write a short note on high energy compounds. (7 + 3)
22. a) Describe β oxidation pathway of saturated fatty acids.
b) What is an enzyme immobilization? Explain entrapment method with its advantages and disadvantages.
c) Briefly describe deamination reactions with suitable example. (4 + 3 + 3)
23. a) Discuss the classification of enzymes.
b) Outline the steps involved in glycolysis.
c) Write the effect of pH on enzyme activity. (3 + 5 + 2)

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