

19. (a) Write the structure and functions of FAD.

Or

(b) Explain KNF model of allosteric enzymes.

20. (a) Discuss about principle and applications of calorimetric biosensor.

Or

(b) Explain the method of physical adsorption for enzyme immobilization.

PART C — (3 × 10 = 30)

Answer any THREE questions.

21. Explain how the enzymes are classified according to International Union of Biochemistry.

22. Derive the rate equation for single substrate enzyme catalyzed reaction.

23. Explain the mechanism of action of chymotrypsin.

24. Explain the sigmoidal kinetics of allosteric enzymes.

25. Explain the structure, mechanism of action and regulation of PDC.

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S.No. 4580

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P 22 BCCC 22

(For candidates admitted from 2022-2023 onwards)

M.Sc. DEGREE EXAMINATION, APRIL 2023.

Biochemistry

ENZYMOLOGY

Time : Three hours

Maximum : 75 marks

PART A — (20 marks)

Answer ALL questions.

1. (A) Multiple choice questions. (5 × 1 = 5)

1. The transition state of the substrate formed during enzyme catalyzed reaction is

- (a) Permanent and stable
- (b) Transient and unstable
- (c) Permanent but unstable
- (d) Transient but stable

2. When the  $V_0$  of enzyme activity is plotted against  $[S_0]$ , which of the following is obtained?

- (a) Hyperbolic curve
- (b) Parabolic curve
- (c) Straight line with positive slope
- (d) Straight line with negative slope

3. The catalytic triad of chymotrypsin consists of which of the following amino acid residues?
- Serine, histidine and aspartate
  - Serine, histidine and glutamate
  - Threonine, histidine and aspartate
  - Methionine, histidine and aspartate
4. Which of the following is a component of the coenzyme A?
- Retinol
  - Pantothenic acid
  - Pyridoxine
  - Retinoic acid
5. What is the prosthetic group of E3 of pyruvate dehydrogenase complex?
- Thiamine pyrophosphate
  - NAD<sup>+</sup>
  - FAD
  - Lipoic acid
- (B) Fill in the blanks. (5 × 1 = 5)
6. Koshland's theory of enzyme activity is also known as \_\_\_\_\_.
7. In LB plot of the enzyme catalyzed reaction Km is given by \_\_\_\_\_ intercept.
8. Iodoacetate form \_\_\_\_\_ linkages with essential -SH groups of enzymes.
9. The graphical method used to determine an enzyme's degree of cooperativity is \_\_\_\_\_.
10. The immobilized enzyme used to produce high fructose syrup from glucose is \_\_\_\_\_.

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11. Answer ALL questions. (5 × 2 = 10)
11. Define Collision theory.
12. Derive LB equation from MM equation.
13. What are irreversible inhibitors? Give example.
14. Write the structure of TPP.
15. What are ribozymes?
- PART B — (5 × 5 = 25)

Answer ALL questions, choosing either (a) or (b).

16. (a) Discuss about Koshland hypothesis of enzyme specificity.
- Or
- (b) Enumerate the characteristic features of active site.
17. (a) Derive Eadie - Hofstee equation and draw the plot.
- Or
- (b) Explain single displacement reaction with one example.
18. (a) Explain the mechanism of action of ribonuclease.
- Or
- (b) Explain feedback inhibition with example.

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18. (a) Explain in brief about Needleman algorithm.  
Or

(b) Write in brief about Smith Waterman Algorithm.

19. (a) What is Hex? Write its importance.  
Or

(b) What is FSSP. Give its importance.

20. (a) Write in brief about genecluster?  
Or

(b) Account on SWISS 2D Page.

PART C — (3 × 10 = 30)

Answer any THREE questions.

21. Discuss in detail about SWISS PROT.

22. Explain in detail about Abinitio method.

23. Write in detail about Phylogenetic Alignment.

24. Account on UNIX with its importance.

25. Elaborate the goals and achievements of HGP?  
\_\_\_\_\_

S.No. 4583

P 22 BCE 2 A

(For candidates admitted from 2022-2023 onwards)

M.Sc. DEGREE EXAMINATION, APRIL 2023

Biochemistry – Elective

BIOINFORMATICS

Time : Three hours

Maximum : 75 marks

PART A — (20 marks)

Answer ALL questions

1. (A) Multiple choice questions : (5 × 1 = 5)

1. Which of the following scientists created the first Bioinformatics database?

- (a) Day Hoff
- (b) Pearson
- (c) Richard
- (d) Michael

2. Which of the following is untrue regarding chour-Fasman and GOR methods?

- (a) Both are the first generation methods
- (b) They are developed in the 1970s
- (c) They suffer from the fact that the prediction rules are somewhat arbitrary
- (d) They are based on single sequence statistics.

3. Which of the following is not a Benefit of Blast?
    - (a) Handling of craps
    - (b) Speed
    - (c) More sensitive
    - (d) Statistical regor
  4. SCOP is \_\_\_\_\_ based on manual comparison of structure
    - (a) entirely
    - (b) almost entirely
    - (c) not
    - (d) partially
  5. According to HGP, genetic similarity between all humans is
    - (a) 90%
    - (b) 95%
    - (c) 99.9%
    - (d) 99.5%
- (B) Fill in the blanks : (5 × 1 = 5)
6. The team Bioinformatics was coined by \_\_\_\_\_.
  7. Full form of PFAM is \_\_\_\_\_.
  8. BLOSUM is used for \_\_\_\_\_ of proteins.

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9. \_\_\_\_\_ is a compiler program written for molecular graphics.
  10. First draft of HGP was published in 2001 in the journal \_\_\_\_\_.
  - II. Answer the following questions. (5 × 2 = 10)
    11. What is biological database? Give examples and its importance.
    12. What is (GOR) method? Why is it used for?
    13. What is PAM Matrix?
    14. Write short notes on Argus.
    15. Define DNA Micro array.
- PART B — (5 × 5 = 25)

- Answer the following in brief : (Internal choice)
16. (a) Explain in brief about the types of databases.  
Or  
(b) Define Pfam.
  17. (a) Explain in brief about GOR method.  
Or  
(b) Write short note on omology modeling.

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19. (a) Illustrate the fine structure of Gene?

Or

(b) Briefly explain the types of Chromosomal Aberrations.

20. (a) Explain about Hybrid Vigor.

Or

(b) Discuss about the factors affecting Gene Frequency

SECTION C — (3 × 10 = 30)

Answer any THREE questions.

21. Write an account on history and concepts of genetics.

22. Illustrate the male sterility (Rode's experiment).

23. Describe the blood groups and their Inheritance in Human.

24. Write in detail about mutation and its types.

25. Discuss about animal breeding.

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S.No. 4581

S.No. 4581

P 22 BCCC 2 A

(For candidates admitted from 2022-2023 onwards)

M.Sc. DEGREE EXAMINATION, APRIL 2023.

Bio-Chemistry — Core Choice Course

GENETICS

Time : Three hours

Maximum : 75 marks

SECTION A — (20 marks)

Answer ALL questions.

1. (A) Multiple choice questions (5 × 1 = 5)
  1. Pea plants were used in Mendel's experiments because
    - (a) They were cheap
    - (b) They had contrasting characters
    - (c) They were available easily
    - (d) All of the above
  2. In males, the gene for colour blindness is located in \_\_\_\_\_.
    - (a) X-chromosome
    - (b) Y-chromosome
    - (c) Both X and Y chromosome
    - (d) Either X-chromosome or Y-chromosome





3. Crossing over is more frequent in
  - (a) Male
  - (b) Female
  - (c) Both
  - (d) None of these
4. The equivalent of a structural gene is
  - (a) Mutton
  - (b) Cistron
  - (c) Operon
  - (d) Recon
5. Breed is defined as?
  - (a) Animals related by descent
  - (b) Animals related by an ascent
  - (c) Animals not related at all
  - (d) Clone of animals
6. \_\_\_\_\_ is the smallest unit of genetic material and produces a phenotypic effect on mutation. (5 × 1 = 5)
7. The term chromosome was coined by \_\_\_\_\_.
8. \_\_\_\_\_ is a fluid connective tissue and the most crucial component of the circulatory system.
9. Complete linkage has been reported in \_\_\_\_\_.
10. \_\_\_\_\_ is also known as single gene heterocisior super dominance theory.

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11. Answer ALL questions (5 × 2 = 10)
    11. What is Atavism?
    12. Define Kappa particles.
    13. Write how are Gynandromorphs formed?
    14. Statement on Recon.
    15. Comment on Eugenics.
- SECTION B — (5 × 5 = 25)
- Answer ALL questions, choosing either (a) or (b).
16. (a) Write a note on Monohybrid Cross.
 

Or

 (b) Illustrate the modification in Mendelian ratios incomplete and Codominance?
  17. (a) Describe chromosomal sex determination.
 

Or

 (b) Briefly explain the cytoplasmic inheritance and its significance.
  18. (a) Elaborate Linkage and Crossing over.
 

Or

 (b) Write an account on mapping of chromosomes.

3

S.No. 4581

19. (a) How will you detect the presence of water, detergent and starch in milk?

Or

(b) Name any five food additives and write its functions.

20. (a) What are the functions and benefits of perfumes in cosmetics?

Or

(b) Explain the regulatory test performed on cosmetic products.

PART C — (3 × 10 = 30)

Answer any THREE questions.

21. Elaborate on the methods that can be adopted to reduce air pollution.

22. Identify any ten prevention methods to minimize water pollution.

23. Discuss the control measures of soil pollution.

24. Explain the various methods of estimation of antioxidants.

25. Describe the standard methods employed for analysis of cosmetic colours.

\_\_\_\_\_

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S.No. 4723

S.No. 4723

P 22 CHNME 1

(For candidates admitted from 2022–2023 onwards)

P.G. DEGREE EXAMINATION, APRIL 2023.

Chemistry – Non Major Elective

CHEMISTRY OF POLLUTION, FOOD AND  
COSMETICS

Time : Three hours

Maximum : 75 marks

PART A — (20 marks)

Answer ALL questions.

1. (A) Multiple choice questions. (5 × 1 = 5)

1. Increased levels of air pollution results in \_\_\_\_\_.

(a) Soil erosion

(b) Global warming

(c) Respiratory problems

(d) All of the above

2. Which of the following are the primary causes of water pollution?

(a) Plants

(b) Animals

(c) Human activities

(d) Rain



3. Soil erosion can be prevented by \_\_\_\_\_.
- Over grazing
  - Removal of vegetation
  - Afforestation
  - Increasing bird population
4. Which among the following is the adulterant in coffee powder?
- Water and starch
  - Lead chromate
  - Chicory and tamarind seeds
  - Brick powder
5. Bee wax is obtained from \_\_\_\_\_.
- Kernel of palm tree
  - Petroleum
  - Synthesis in laboratory
  - Bee lives
- (B) Fill in the blanks. (5 × 1 = 5)
6. 21% of the total air composition is composed of \_\_\_\_\_ gas.
7. \_\_\_\_\_ sources of pollution are those where a source of pollution cannot be easily identified.
8. Reduction in soil productivity due to erosion and overuse is called \_\_\_\_\_ soil pollution.
9. Iodine solution is used to test the presence of \_\_\_\_\_.
10. \_\_\_\_\_ is a mixture of essential oil or aroma compounds, used to give the human body a pleasant scent.

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S.No. 4723

11. Answer ALL questions. (5 × 2 = 10)
- Write the composition of air.
  - Mention any four types of water.
  - List the causes of soil erosion.
  - Define adulteration.
  - What are RGB and CMYK colour schemes?

PART B — (5 × 5 = 25)

Answer ALL questions, choosing either (a) or (b).

16. (a) Differentiate primary air pollutant from secondary air pollutants.

Or

- (b) Explain the effect of air pollution on human health.

17. (a) Explain the causes of water pollution.

Or

- (b) Give a brief note on water quality parameters.

18. (a) How is soil quality measured?

Or

- (b) List any five methods adopted to manage soil quality.

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S.No. 4723



(6 pages)

S.No. 4579

P 22 BCCC 21

*C.M.Sc*  
*11*  
*Apr 21 2023*

(For candidates admitted from 2022-2023 onwards)

M.Sc. DEGREE EXAMINATION, APRIL 2023.

Biochemistry

BIOPHYSICAL CHEMISTRY

Time : Three hours

Maximum : 75 marks

SECTION A — (20 marks)

Answer ALL questions

- I. (A) Multiple choice questions (5 × 1 = 5)
  1. The Standard Gibb's free energy,  $\Delta G^\circ$ , is
    - (a) the residual energy present in the reactants at equilibrium
    - (b) the residual energy present in the products at equilibrium
    - (c) the difference in the residual energy of reactants and products at equilibrium
    - (d) the energy required to convert one mole of reactants to one mole of products
  2. Considering the formation, breaking and strength of hydrogen bond, predict which of the following mixtures will show a positive deviation from Raoult's law?
    - (a) Methanol and acetone
    - (b) Chloroform and acetone
    - (c) Nitric acid and water
    - (d) Phenol and aniline
  3. The cell constant of a conductivity cell \_\_\_\_\_
    - (a) changes with change of electrolyte
    - (b) changes with change of concentration of electrolyte
    - (c) changes with temperature of electrolyte
    - (d) remains constant for a cell
  4. Which of the following does not show the Tyndall effect?
    - (a) colloidal solution
    - (b) isotonic solution
    - (c) both of these
    - (d) none of these

5. The analysis of electromagnetic radiation scattered, and emitted by the molecule is called \_\_\_\_\_
- (a) Kaleidoscopy (b) Astronomy  
(c) Spectroscopy (d) Anatomy
- (B) Fill in the blanks (5 × 1 = 5)
6. Helmholtz free energy is given by the formula \_\_\_\_\_
7. Maximum amount of a solid solute that can be dissolved in a specified amount of a given liquid solvent does not depend upon \_\_\_\_\_
8. An electrochemical cell can behave like an electrolytic cell when \_\_\_\_\_
9. The diameter of particles in a colloidal system is \_\_\_\_\_
10. The law which states that within elastic limits strain produced is proportional to the stress producing it is known as \_\_\_\_\_

3

S.No. 4579

11. Answer the following questions (5 × 2 = 10)
11. What is meant by a thermodynamics system? How do you classify it?
12. Henry's Law constant for CO<sub>2</sub> in water is  $1.67 \times 10^9$  Pa at 298 K. Calculate the quantity in 1 L of soda water when packed under 2.5 atm pressure at 298 K.
13. What is electrode potential?
14. What is self-assembled monolayer molecules?
15. What is Electromagnetic Radiation?

SECTION B — (5 × 5 = 25)

Answer ALL questions, choosing either (a) or (b).

16. (a) Write short notes on Free energy, Enthalpy, and entropy
- Or
- (b) Explain the Zeroth law of thermodynamics. What is its physical significance?

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[P.T.O]



SECTION C — (3 × 10 = 30)

Answer any THREE questions

17. (a) What is Osmotic Pressure? Calculate the osmotic pressure of a potassium chloride solution (at 300 K) in 50 atmospheres. What is the molar concentration of potassium chloride in this solution?  
Or  
(b) State Henry's law and mention some important applications?
18. (a) Write a note on Salt bridge and its function.  
Or  
(b) Define concentration cells. Explain the types of concentration cells.
19. (a) What is coagulation? Explain the Hardy and Schulze rules.  
Or  
(b) Write a brief note on (i) Tyndall effect and (ii) zeta potential.
20. (a) Explain EMR and how are they characterized?  
Or  
(b) Write a note on types of molecular spectra.
21. Discuss the Laws of Thermodynamics and their Applications.
22. What is Freezing Point Depression? Why does the Freezing Point Depression Occur?
23. Write a note on (a) cell potential (b) electrode potential (c) cell e.m.f (d) reference electrode (e) standard electrode potential.
24. Explain the Purification of colloidal solution.
25. Give an account on IR Spectra.