F–8511	Sub. Code
	7MBC1C1

M.Sc. DEGREE EXAMINATION, NOVEMBER 2022

First Semester

Biochemistry

CHEMISTRY OF BIOMOLECULES

(CBCS – 2017 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Define an Atom.

2. What is covalent bond? Give Example.

3. Give the Structure of Cellulose?

4. What are monosacharides? Give Example.

5. Define Isoelectric Point.

6. Write notes on protein modification.

7. Difference between Saturated and unsaturated fatty acids.

8. Define Saponification.

9. Define Nucleotide.

10. What is a Triplet Repeat Sequence?

Part B (5 × 5 = 25)

Answer **all** questions, choosing either (a) or (b).

11. (a) What are hypertonic and hypotonic solutions? Explain with examples.

Or

(b) What are the three types of Covalent bonds? What is the different between them?

12. (a) What are polysaccharides? Given any one example.

Or

(b) What are Disaccharides. Explain with illustration.

13. (a) Explain protein Fingerprinting.

Or

(b) Define

(i) Metalloproteins

(ii) Lipoprotein

(iii) Nucleoprotein

(iv) Glycoprotein

14. (a) Explain the types of Fattyacids.

Or

(b) Explain the physical and chemical properties of fats?

15. (a) Structure of DNA.

Or

(b) Explain about the RNA involved in the post transcriptional process.

Part C (3 × 10 = 30)

Answer any **three** questions.

16. Elaborate on Henderson – Hassel bach equation.

17. Describe in detail on structures and biological importance of Oligosaccharides.

18. Explain the Ramachandran plot.

19. Explain the properties and functions of Phospholipid's?

20. Write about the classification, structures and functions of RNA.

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F– 8513

Sub. Code
7MBC2C1

M.Sc. DEGREE EXAMINATION, NOVEMBER 2022

Second Semester

Biochemistry

CELL BIOLOGY

(CBCS – 2017 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** the questions.

1. What is a neuromuscular junction?

2. What are voltage-gated channels?

3. What is the main function of rough and smooth endoplasmic reticulum?

4. What is photorespiration?

5. What is euchromatin?

6. What is the function of histone in nucleosomes?

7. What is pachytene stage?

8. What is Ubiquitination?

9. What is the function of TGF beta receptors?

10. What is radiation carcinogenesis?

Part B (5 × 5 = 25)

Answer **all** questions, choosing either (a) or (b).

11. (a) Write a short note on active transport with an example.

Or

(b) Give a detailed note on the structure and functions of gap junction.

12. (a) Explain the process by which ATP synthesis occurs in a cell.

Or

(b) Enumerate on the functions of chloroplast and give a neat diagram of its structure.

13. (a) Explain the salient features of lampbrush chromosome.

Or

(b) Discuss on the major functions of nucleus.

14. (a) Write elaborately on the different phases and functions of mitosis.

Or

(b) Discuss in detail on the factors and genes that regulate the cell cycle.

15. (a) Differentiate between apoptosis and necrosis and explain the method for detecting both the processes.

Or

(b) Write a note on the signalling cascade which involves tyrosine kinase.

Part C

$(3 \times 10 = 30)$

Answer any **three** questions.

16. Differentiate between a prokaryotic and an eukaryotic cell in terms of organization of membrane.

17. Write a detailed note on the components present in the different complexes involved in electron transport chain.

18. Give a detailed note on the chemical composition of chromosomes.

19. Explain the structure and organization of biological membrane.

20. Elaborate on the significance of G protein coupled signalling pathway.

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F–8514	Sub. Code
	7MBC2C2

M.Sc. DEGREE EXAMINATION, NOVEMBER 2022

Second Semester

Biochemistry

MICROBIOLOGY AND IMMUNOLOGY

(CBCS – 2017 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. What is differential media? Give examples.

2. Define akinetes.

3. What is stonewort?

4. List the ways to control fungal growth.

5. What is MALT?

6. Define T Suppressor cells.

7. What is primary response in immunity?

8. Define avidity.

9. Mention any four immunosuppressive agents.

10. What is SCID?

Part B (5 × 5 = 25)

Answer **all** questions, choosing either (a) or (b).

11. (a) Give an account on the cytoplasmic inclusions of bacteria.

Or

(b) Enumerate the physical conditions required for the growth of bacteria.

12. (a) Write short notes on RNA viruses.

Or

(b) With a neat sketch explain the morphological characters of euglena.

13. (a) Explain the structure and importance of spleen.

Or

(b) Differentiate between allotype and idiotype.

14. (a) Comment on acquired defence mechanism against the bacterial and viral infections.

Or

(b) Give an account on immunotolerance.

15. (a) Illustrate the structure and functions of Major Histocompatibility Complex.

Or

(b) Highlight on the methods for immunotherapy tumour.

Part C

(3 × 10 = 30)

Answer any **three** questions.

16. Explain the methods of isolation and maintenance of pure culture.

17. Illustrate the classification of fungi with suitable examples.

18. Describe the alternative pathway with regard to its function.

19. Elaborate on the mechanism of cell mediated immunity.

20. Explicate the origin, symptoms and treatment of autoimmune diseases.

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F–8515	Sub. Code
	7MBC2C3

M.Sc. DEGREE EXAMINATION, NOVEMBER 2022

Second Semester

Biochemistry

BIOTECHNOLOGY

(CBCS – 2017 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Define chimera.
2. What is palindromic sequence? Give an example.
3. What is autoradiography?
4. Write the dyes used in real-time PCR.
5. What is ribozyme?
6. What is obesity?
7. What are abzymes?
8. What is edible vaccine? Give examples.
9. What are the different batch systems in bioreactor?
10. What are the downstream stages in fermentation process?

Part B (5 × 5 = 25)

Answer **all** questions, choosing either (a) or (b).

11. (a) Explain the advantage and disadvantage of phagemid.

Or

(b) Explain the advantage and disadvantage of cosmid.

12. (a) Explain the principle of agarose gel electrophoresis.

Or

(b) Describe the clinical application of PCR.

13. (a) Describe the therapeutic applications of MAbs.

Or

(b) Describe in brief about the RNA vaccines.

14. (a) Explain the gene therapy for haemophilia.

Or

(b) Write about diagnostic imaging.

15. (a) Explain the industrial application of organic acids.

Or

(b) Explain the clinical applications of vitamins.

Part C (3 × 10 = 30)

Answer any **three** questions.

16. Describe different methods of screening of recombinants.

17. Write a detailed note on real-time PCR.

18. Give a detailed note on molecular diagnostic of AIDS and Cystic fibrosis

19. Illustrate on the production and clinical applications of hybridoma technology.

20. Discuss in detail on the processes involved in the production and industrial application of ethanol.

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F–8516	Sub. Code
	7MBC2E1

M.Sc. DEGREE EXAMINATION, NOVEMBER 2022.

Second Semester

Biochemistry

Elective: BIOPROCESS TECHNOLOGY

(CBCS – 2017 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** the questions.

1. What are fermentors?

2. State the role of spargers in fermentation.

3. List any four methods for Enzyme immobilisation.

4. State the importance of foam control in fermentation process.

5. What is hybridoma technology?

6. Mention any four applications of monoclonal antibodies.

7. Define Erythropoitin.

8. Mention the importance of biofuels.

9. State the role of trypsin in medical Industry.

10. List any two applications of amylase in food industry.

Part B (5 × 5 = 25)

Answer **all** questions, choosing either (a) or (b).

11. (a) Explain the various components of fermentors.

Or

(b) Discuss in brief about the parameters affecting fermentation process.

12. (a) Write a brief note on media formulation.

Or

(b) Give an account on immobilization of enzymes and cells.

13. (a) Explain in brief about antibody engineering.

Or

(b) Write short notes on genetically modified organisms.

14. (a) Outline the synthesis of Insulin.

Or

(b) Explain the production of alcohols.

15. (a) Discuss the role of streptokinase and urokinase in medical industry.

Or

(b) Explain the production and application of phosphatases in research industry.

Part C

$(3 \times 10 = 30)$

Answer any **three** questions.

16. Discuss in brief about the various downstream process for purification of products.

17. Write a brief note on

    (a) Batch and continuous process of harvesting.

    (b) Aerobic and Anaerobic fermentation.

18. Give a detailed account on Gene transfer technology.

19. Describe the method for synthesis of monoclonal antibodies.

20. Explain the production, application of pectinase and cellulose in food industry.

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F–8518	Sub. Code
	7MBC3C1

M.Sc. DEGREE EXAMINATION, NOVEMBER 2022.

Third Semester

Biochemistry

GENE EXPRESSION AND METABOLIC REGULATION

(CBCS – 2017 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** the questions.

1. Define activators.

2. What do you mean by RNAi?

3. Write the importance of phosphorylation in signal transduction.

4. Mention the function of ADH.

5. Define Aminosugars.

6. Write the role of ATP/ADP in carbohydrate metabolism.

7. Define ketosis.

8. What happens during the starvation? Write the schematic representation of the mechanism.

9. What do you mean by Lesch-Nyhan Syndrome?

10. Give the significance of NMP and NDP kinases.

Part B (5 × 5 = 25)

Answer **all** the questions, choosing either (a) or (b).

11. (a) Distinguish the role of promoter genes and repressor genes.

Or

(b) Give a brief note on analogs with examples.

12. (a) Briefly explain the role of calcium in signal transduction.

Or

(b) Write a short note on the importance of hormones in fluid and electrolyte metabolism.

13. (a) Explain the important enzymes of carbohydrate metabolism.

Or

(b) Describe uronic acid pathway.

14. (a) Give a detailed account on β – oxidation of fatty acids.

Or

(b) How does our human body control the temperature? Explain the various mechanisms.

15. (a) What do you mean by Urolithiasis? Explain.

Or

(b) Discuss about the enzymes of salvage pathway in recycling pyrimidine bases.

Part C

$(3 \times 10 = 30)$

Answer any **three** questions.

16. Explain the mode of Trp operon.

17. Elaborate on the role of angiotensin in regulation of blood pressure.

18. Give a detailed account on gluconeogenesis.

19. Highlight the importance of urea cycle.

20. Discuss the catabolism of purine nucleotides.

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F–8519	Sub. Code
	7MBC3C2

M.Sc. DEGREE EXAMINATION, NOVEMBER 2022

Third Semester

Biochemistry

MEDICAL BIOCHEMISTRY

(CBCS – 2017 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Name any two units used in expressing standard solutions and define the same.

2. What is quality control?

3. Define cysteine – Fanconi syndrome.

4. Define gamma globulinemia.

5. What is Diabetic coma?

6. What is fatty liver?

7. How does obesity causes atherosclerosis?

8. Name the diagnostic significance of having protein in urine.

9. What is amniotic fluid? At what condition it is analyzed?

10. What is Jaundice? Name any two test that confirms jaundice?

Part B (5 × 5 = 25)

Answer **all** questions, choosing either (a) or (b).

11. (a) Write on the enzyme pattern in health and diseases with special reference to ALP, CPK.

Or

(b) How are enzymes pattern predicted in acute and chronic condition of a disease?

12. (a) Write shortly on plasma protein disorders.

Or

(b) Write on the different disorders developed due to tyrosine metabolism.

13. (a) Give an account on hypoglycemic agents.

Or

(b) Write a short note on Hyper choleseterolemia.

14. (a) Mention the advantages and disadvantages of dialysis.

Or

(b) Write briefly on the relationship between blood pressure and renal function.

15. (a) How s ESR test performed? What is the significance of doing ESR test?

Or

(b) Name the test performed for meningitis. Comment on it.

Part C

$(3 \times 10 = 30)$

Answer any **three** questions.

16. Explain the major enzyme patterns in case of liver disease.

17. Describe on Gout, its types, a nucleic acid metabolic disorder.

18. Elaborate on laboratory diagnosis of early and late diabetes.

19. Explain the lab test done for the analysis of abnormal constituents of urine.

20. Describe liver function test in detail with suitable example.

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F–8520

Sub. Code
7MBC3C3

M.Sc. DEGREE EXAMINATION, NOVEMBER 2022

Third Semester

Biochemistry

MOLECULAR BIOLOGY

(CBCS – 2017 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Define cistron.

2. What is non-coding sequence?

3. What is origin of replication?

4. Write any 6 inhibitors of replication.

5. Define mutation and mutagens. Name any four chemical mutagens.

6. What is Linkage?

7. What is cis-trans test?

8. Define *Hfr*.

9. Define transduction.

10. What is genetic drift.

Part B (5 × 5 = 25)

Answer **all** questions, choosing either (a) or (b).

11. (a) Explain the mechanism of transposition.

Or

(b) Explicate chromatin condensation with neat sketch.

12. (a) Explain transcription in prokaryotes with neat sketch.

Or

(b) Write a brief note on RNA processing.

13. (a) Brief note on multifactor crosses.

Or

(b) Illustrate on complementation with suitable example.

14. (a) Write a brief note on insertion sequences.

Or

(b) Explain mapping genes by interrupted mating.

15. (a) Explain genetic control on fate determination in *C. elegans*.

Or

(b) Give a brief note on segmentation genes.

Part C

$(3 \times 10 = 30)$

Answer any **three** questions.

16. Illustrate in detail about the genome organization in prokaryotes.

17. Discuss the characteristics of Genetic code.

18. Give a detailed note on types of mutation.

19. Describe in detail about the genetic transfer methods.

20. Discuss Hardy Weinberg's theory and its application.

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F–8521	Sub. Code
	7MBC3E1

M.Sc. DEGREE EXAMINATION, NOVEMBER 2022.

Third Semester

Biochemistry

Elective – BIOPHARMACEUTICALS

(CBCS – 2017 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. What is lead compound? Why is has to be modified?

2. Justify the need for new drug development.

3. Define Bioavailability of drug. Give its significance.

4. What is drug metabolism?

5. Differentiate between mode of treatment by enzyme stimulation and enzyme inhibition.

6. Define MIC, How is MIC related to drug activity.

7. What are the pharmaceutical products that are derived from insects? Name any two and give its significance.

8. What are secondary metabolites? Give its significance.

9. Define Interleukin. Give any two functions.

10. Define gene delivery systems and give any two example.

Part B (5 × 5 = 25)

Answer **all** questions, choosing either (a) or (b).

11. (a) Comment on physiochemical parameters in drug designing.

Or

(b) Discuss on the role of computer in drug designing.

12. (a) Write short note on

(i) enhancement of drug and

(ii) site specific delivery.

Or

(b) How does polymorphism affect drug metabolism? Explain with suitable example.

13. (a) Differentiate agonist and antagonist.

Or

(b) Discuss on the role of membrane in drug transport.

14. (a) Write briefly on probiotics and its siginificance.

Or

(b) Comment of shikimate pathway and its significance.

15. (a) Discuss on clotting factors.

Or

(b) Write shortly on alginate lyase.

Part C

$(3 \times 10 = 30)$

Answer any **three** questions.

16. Discuss on the role of enzymes, receptors in drug target.

17. Elaborate on the relationship between drug metabolism and pathology.

18. Enumerate on lock and key concept of drug receptor interaction and its advantages.

19. Discuss on any two pharmaceutical products developed from microbe.

20. Explain in detail on pharmaceutical products of DNA technology – Human growth Hormone.

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F–8522	Sub. Code
	7MBC3E2

M.Sc. DEGREE EXAMINATION, NOVEMBER 2022

Third Semester

Biochemistry

Elective – DRUG MODELLING AND DESIGNING

(CBCS – 2017 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Define pharmacokinetics.
2. What is drug modeling?
3. What is FTO in drug development?
4. Comment on randomised controlled trial?
5. Define pharmacodynamics.
6. What is dose optimization?
7. What is intestinal permeability?
8. What are the advantages of lipid soluble drugs?
9. Brief note on the databases used to screen the drugs.
10. What is a bioactive compound?

Part B (5 × 5 = 25)

Answer **all** questions, choosing either (a) or (b).

11. (a) Comment on the concept of drug development.

Or

(b) Explain the philosophies in drug design.

12. (a) Reveal the problems in pre-clinical trials.

Or

(b) Comment on target identification technique.

13. (a) "Margin of safety in toxicology"-justify.

Or

(b) Enumerate the kinetics of drug action.

14. (a) Highlight the role of physiological variables in GI tract in drug absorption.

Or

(b) Discuss in brief on the composition of plasma membrane.

15. (a) Comment on the contribution of computer graphics in drug designing.

Or

(b) Evaluate the binding screening strategies for novel leads in computer aided drug designing.

Part C

$(3 \times 10 = 30)$

Answer any **three** questions.

16. Elaborate on the principle and molecular visualization of drug design.

17. Illustrate the various phases of clinical studies.

18. Elucidate on the antibody-peptide structure based drug designing.

19. Discuss the mechanism of transport of designed drug macromolecules across the biological membranes.

20. Describe computer aided designing of bioactive based on 3D properties of ligands.

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F–8523	Sub. Code
	7MBC3E3

M.Sc. DEGREE EXAMINATION, NOVEMBER 2022

Third Semester

Biochemistry

Elective – HORMONES AND CELL SIGNALING

(CBCS – 2017 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** the questions.

1. Define Autacoids.
2. Draw the structure of Glycoproteins.
3. What are G-Protein coupled receptors?
4. Give any two examples of G-Protein coupled receptors.
5. What are receptor tyrosine kinases?
6. Draw the structure of cyclic AMP.
7. Define steroids.
8. What are steroid hormone receptors?
9. What are NR3 receptors?
10. What is meant by type II Diabetes.

Part B (5 × 5 = 25)

Answer **all** questions choosing either (a) or (b).

11. (a) Write short notes on peptide hormones.

Or

(b) Discuss briefly about intracellular receptors.

12. (a) Lit out the functions of G-protein coupled receptors.

Or

(b) Explain briefly about G-protein receptor super family.

13. (a) Write short notes on phospholipids signaling.

Or

(b) Write a note on cyclic AMP.

14. (a) Give a brief account on Hormone Response Elements.

Or

(b) Explain how steroids are involved in regulation of transcription.

15. (a) List out the clinical importance of hormone signaling.

Or

(b) Write short notes on role of hormone receptors in the promotion of cancer.

Part C

$(3 \times 10 = 30)$

Answer any **three** questions.

16. Elaborate on Iodothyronines and Glycoproteins – structure and functions.

17. Explain in detail about mutations in G-protein genes.

18. Write in detail about Receptor tyrosine kinases with neat illustrations.

19. Discuss in detail about thyroid super family of receptors.

20. Discuss in detail about hormone resistance syndrome.

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