F–2978

M.Sc. DEGREE EXAMINATION, NOVEMBER 2019

First Semester

Biochemistry

CHEMISTRY OF BIOMOLECULES

(CBCS – 2017 onwards)

Time : 3 Hours   Maximum : 75 Marks

Part A   (10 × 2 = 20)

Answer **all** questions.

1.   What is meant by isotonic solution?

2.   Compare exergonic and endergonic reactions.

3.   Define optical isomerism.

4.   What are epimers. Give an example.

5.   Define denaturation of proteins.

6.   What are metalloproteins?

7.   What is meant by saponification value?

8.   Write any two biological importance of sphingo myelins.

9.   Mention the two unusual bases present in the loop of all tRNA molecules.

10. What is hyperchromicity?

Part B (5 × 5 = 25)

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

11. (a) Give an account on non-covalent bonding.

    Or

    (b) Define pH and brief about Henderson-Hasselbach equation.

12. (a) Write short notes on marine polysaccharides.

    Or

    (b) Discuss the occurrence and biological importance of oligosaccharides.

13. (a) Explain the forces stabilising the structure of protein conformation.

    Or

    (b) Describe the secondary structure of proteins.

14. (a) Discuss the biological importance of facts.

    Or

    (b) How will you classify fatty acids?

15. (a) Illustrate the Watson and Crick model of DNA.

    Or

    (b) Explain denaturation and renaturation kinetics of DNA.

2

F–2978

Part C (3 × 10 = 30)

Answer any **three** questions.

16. Give a detailed account on the types of solutions and its concentration units-molarity and normality.

17. Discuss the structure occurrence and biological importance of monosaccharides.

18. Describe the chemical synthesis of polypeptides.

19. Write short notes on

    (a) Glycolipids

    (b) Phospholipids.

20. Elaborate on the classification, structure and functions of RNA.

————————

F–2978

F–2979	Sub. Code
	7MBC1C2

M.Sc DEGREE EXAMINATION, NOVEMBER 2019

First Semester

Biochemistry

ANALYTICAL BIOCHEMISTRY

(CBCS – 2017 onwards)

Time : 3 Hours　　　　　　　　　　　Maximum : 75 Marks

Part A　　　　　　　　$(10 \times 2 = 20)$

Answer **all** the questions.

1. How are tissues homogenized?

2. What is the principle of Cryopreservation?

3. Differentiate between Western and Eastern blotting.

4. What is Zone electrophoresis?

5. What is UV range?

6. What is Photoacoustic Spectrum?

7. What is dosimetry?

8. What is tritium?

9. What is tandem mass spectrometry?

10. What is the significance of amine protecting groups in peptide synthesis?

Part B $(5 \times 5 = 25)$

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

11. (a) Write a note on differential centrifugation.

Or

(b) What are the different types of rotors used for centrifugation?

12. (a) Discuss on the technique and applications of GC MS.

Or

(b) Write a detailed note on cellulose acetate electrophoresis.

13. (a) Discuss in detail on ORD.

Or

(b) Give an account on the principle and application of NMR.

14. (a) Write a short note on the radioisotopes used in biochemistry.

Or

(b) Explain the characteristic of nuclear emulsion used in biological studies.

15. (a) What is fluorescence immunoassay? Explain

Or

(b) Elaborate on the MALDI-TOF-TOF technique.

2   **F–2979**

Part C (3 × 10 = 30)

Answer any **three** questions.

16. Give a detailed note on the principle and applications of ultracentrifuges.

17. Discuss on IEF and its applications.

18. Elaborate on the application of atomic absorption spectrophotometry.

19. Give a detailed note on the applications of autoradiography.

20. Explain the methodology for DNA synthesis.

————————

F–2979

F-2980

M.Sc, DEGREE EXAMINATION, NOVEMBER 2019

First Semester

Biochemistry

ENZYME TECHNOLOGY

(CBCS – 2017onwards)

Time : 3 Hours   Maximum : 75 Marks

Part A $(10 \times 2 = 20)$

Answer **all** questions.

1.   What is an active site?

2.   What is lock and key model?

3.   Define K_{cat}.

4.   What is reversible inhibitions.

5.   Name any four industrially important enzymes.

6.   What is a freeze-dried enzyme?

7.   What are enzyme bioreactors?

8.   Name the enzymes used in rDNA technology.

9.   What are artificial enzymes?

10.   What is an optical biosensor?

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

11. (a) Explain the types of bisubstrate reaction.

Or

(b) Write a detailed note on multienzyme complex.

12. (a) Give a detailed note on allosteric enzymes.

Or

(b) Differentiate between competitive and non-competitive inhibition.

13. (a) How does microbes act as a source of enzymes? Explain

Or

(b) Discuss on the criteria for enzyme purity.

14. (a) Explain the different types of natural agents used for enzyme immobilization.

Or

(b) Enumerate on the advantage and disadvantages of immobilization techniques.

15. (a) Discuss on multienzyme electrodes.

Or

(b) Explain the principle and components immune biosensors.

F-2980

Part C (3 × 10 = 30)

Answer any **three** questions.

16. What are coenzymes? Explain their functions?

17. Explain the different factors which affect the enzyme activity.

18. Explain the methodology of enzyme purification.

19. Give a detailed note on the enzyme immobilization techniques encapsulation and covalent binding.

20. Discuss in detail on biochips and biocomputers.

————————

3 **F-2980**

F–2981

Sub. Code
7MBC1C4

M.Sc. DEGREE EXAMINATION, NOVEMBER 2019

First Semester

Biochemistry

PLANT BIOCHEMISTRY

(CBCS – 2017 onwards)

Time : 3 Hours   Maximum : 75 Marks

Part A $(10 \times 2 = 20)$

Answer **all** questions.

1. What is spherosome?

2. Define dictyosomes.

3. What is whip tail disease?

4. Mention any two sulphur assimilating bacteria.

5. Distinguish between red drop and Emerson's effect.

6. Write the functions of RUBP carboxylase.

7. What is abscisic acid?

8. Draw the structure of gibberellic acid.

9. What is nectotroph?

10. What is appressorium?

Part B $(5 \times 5 = 25)$

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

11. (a) Explain the mechanism of translocation through phloem.

Or

(b) Discuss the cytoskeletal components in plants.

12. (a) Explain the effect of soil type on nutrient availability.

Or

(b) Evaluate the role and deficiency symptoms of calcium and molybdenum in plant nutrition.

13. (a) Enumerate on the factors affecting photosynthesis.

Or

(b) Outline the steps involved in sucrose biosynthesis.

14. (a) Write the steps involved in alkaloid biosynthesis.

Or

(b) Give an account on anthocyanin and its economic importance.

15. (a) Enlist the pathological effects of respiration.

Or

(b) Give an account on phytoalexins.

F–2981

Part C $(3 \times 10 = 30)$

Answer any **three** questions.

16. Describe the structure and functions of plant cell wall.

17. Write an essay on biological nitrogen fixation.

18. Trace the path of carbon in C_3 plants.

19. Elucidate the biosynthesis and mechanism of action of cytokinin.

20. Explain the mechanism of specificity in plant pathogen interactions.

————————

3 **F–2981**

F–2982	Sub. Code
	7MBC1E1

M.Sc. DEGREE EXAMINATION, NOVEMBER 2019

First Semester

Biochemistry

Elective – FOOD TECHNOLOGY

(CBCS – 2017 onwards)

Time : 3 Hours　　　　　　　Maximum : 75 Marks

Part A　　　　(10 × 2 = 20)

Answer **all** questions.

1. Define perishable foods.

2. Write the nutritive value of wheat.

3. What is meant by dehydrofreezing?

4. Mention any four methods of food preservation.

5. Define souring.

6. State the cases for deterioration of raw vegetables.

7. What are aflatoxins?

8. Compare bacterial food intoxication and bacterial food infection.

9. Define fermentation.

10. How are microorganisms useful in bread making.

Part B (5 × 5 = 25)

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

11. (a) Describe the method of enumerating microorganisms in food.

Or

(b) Explain the factors that affects the microbial growth in food.

12. (a) Write short notes on Canning.

Or

(b) Explain the process of control of microorganisms using radiations.

13. (a) Describe the microbial spoilage of fruit and fruit products.

Or

(b) Discuss about the microbial spoilage of fish.

14. (a) Highlight the signs, symptoms and control measures of salmonellosis.

Or

(b) Give a brief account on the detection of disease causing microorganisms.

15. (a) Outline the production of Vinegar.

Or

(b) Write a note on fermented milk and Yoghurt.

2 **F–2982**

Part C (3 × 10 = 30)

Answer any **three** questions.

16. Elaborate on the types and sources of microorganisms associated with food.

17. Discuss in detail about the control of microorganisms using low temperature and drying.

18. Describe the microbial spoilage of cereals and Pulses.

19. Explain in detail about staphylococcal food intoxication.

20. Summarize the production of beer.

————————

3   **F–2982**

F–2983	Sub. Code
	7MBC2C1

M.Sc. DEGREE EXAMINATION, NOVEMBER 2019

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 are microtubules?

2. Define membrane potential.

3. What is perimitochondrial space?

4. What is Calvin Cycle?

5. What are lamp brush chromosomes?

6. What are microbodies?

7. What is meiosis?

8. What are the major components of cell membrane?

9. What is the role of interleukins in signal transduction?

10. Name any two chemical carcinogen.

Part B (5 × 5 = 25)

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

11. (a) Write in brief on the differences between active and passive transport.

Or

(b) Discuss the role of liposomes as model membranes.

12. (a) Elaborate on the structure of mitochondria.

Or

(b) Discuss on the salient features of golgi complex.

13. (a) Elaborate on the core particle of nucleosomes.

Or

(b) Discuss in detail on chromosome banding.

14. (a) Write a detailed note on the types of proteins present in membrane.

Or

(b) Explain the different phases of cell cycle in detail.

15. (a) Differentiate between apoptosis and necrosis.

Or

(b) Discuss on G protein linked signaling mechanism.

2 **F–2983**

Part C (3 × 10 = 30)

Answer any **three** questions.

16. Explain the process of neurotransmission.

17. Discuss on the process of photosynthesis and photorespiration.

18. Give a detailed note on the gross structure of chromosomes.

19. Explain the mechanism of cell division in detail.

20. Elaborate in detail on MAP kinase pathway.

————————————

3   F–2983

F–2984

Sub. Code
7MBC2C2

M.Sc. DEGREE EXAMINATION, NOVEMBER 2019

Second Semester

Biochemistry

MICROBIOLOGY AND IMMUNOLOGY

(CBCS – 2017 onwards)

Time : 3 Hours   Maximum : 75 Marks

Part A   (10 × 2 = 20)

Answer **all** questions.

1. Define Chemostat.

2. Differentiate Gram positive and negative bacteria.

3. What is diatom? Mention its uses.

4. What is lysogenic cycle?

5. Define epitope.

6. What is idiotype?

7. Define cytokines.

8. What is adjuvant?

9. How is agammago bulinaemia caused?

10. What is mantoux reaction?

Part B   (5 × 5 = 25)

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

11. (a)   How will you isolate microbes by pour and spread plate techniques?

Or

(b)   Explain the structure of bacterial flagella with a neat labeled sketch.

12. (a)   Comment on RNA viruses.

Or

(b)   With a labeled diagram explain the structure of amoeba.

13. (a)   Present the structure and functions of IgM.

Or

(b)   Justify the role of thymus in immune system.

14. (a)   Write a brief account on immunization against infections.

Or

(b)   Give an account on immunological memory.

15. (a)   Explain the types of graft.

Or

(b)   Write short notes on immunotherapy for tumor.

F–2984

Part C (3 × 10 = 30)

Answer any **three** questions.

16. Classify the bacteria based on its nutritional requirements.

17. Illustrate the classification of fungi with suitable examples.

18. Describe the alternative pathway of complement system.

19. Highlight the steps involved in T cell activation.

20. Write an essay on autoimmune diseases.

––––––––––––––

3   **F–2984**

F–2985	Sub. Code
	7MBC2C3

M.Sc. DEGREE EXAMINATION, NOVEMBER 2019

Second Semester

Biochemistry

BIOTECHNOLOGY

(CBCS – 2017 onwards)

Time : 3 Hours   Maximum : 75 Marks

Part A $(10 \times 2 = 20)$

Answer **all** questions.

1.   What is cohesive end ligation?

2.   What is Rlenow filling?

3.   Mention the role of SDS in polyacrylamide gel electrophoresis.

4.   Define auto radiography.

5.   What is sonoporation?

6.   Expand SCID.

7.   List the limitations of monoclonal antibodies.

8.   What is molecular pharming?

9.   Differentiate homofermentative and heterofermentative bacteria.

10. Name the microbes used for the production of β-carotene.

Part B   (5 × 5 = 25)

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

11. (a) Give an account on phagemids.

Or

(b) Enumerate the steps involved in gene cloning.

12. (a) Comment on pulse field gel electrophoresis.

Or

(b) Explain the principle and methodology of nested PCR.

13. (a) "Ribozymes as therapeutic agents" – Substantiate.

Or

(b) How will you diagnose tuberculosis using genetically engineered bacteriophage?

14. (a) Outline the steps involved in the production of recombinant human grow the hormone.

Or

(b) Write short notes on catalytic monoclonal antibody.

15. (a) Explain the types of bioreactor.

Or

(b) Present the production of vitamin B_{12} using propionibacterium species.

Part C   (3 × 10 = 30)

Answer any **three** questions.

16. Write an essay on yeast and bacterial artificial chromosomes.

17. Discuss the principle, methodology and applications of Northern blotting techniques.

18. Describe the molecular diagnosis of any three genetic diseases.

19. Elaborate on the production of monoclonal antibodies.

20. Elucidate the methods involved in the production of ethanol.

————————

F–2985

F–2986

M.Sc. DEGREE EXAMINATION, NOVEMBER 2019

Second Semester

Biochemistry

Elective – BIOPROCESS TECHNOLOGY

(CBCS 2017 onwards)

Time : 3 Hours　　　　　　　　　　Maximum : 75 Marks

Part A　　　　　　　(10 × 2 = 20)

Answer **all** questions.

1.　Define fermentation.

2.　Mention the role of agitators in fermentation.

3.　List the advantages of enzyme immobilization.

4.　Compare batch and continuous fermentation.

5.　What is meant by Genetically modified organisms?

6.　What is PEG?　Mention its uses.

7.　What is alternative fuel?　Give an example.

8.　What are antibiotics?　Give two examples.

9.　Write any two applications of amylase in food industry.

10.　State the role of ligases in research industry.

Part B (5 × 5 = 25)

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

11. (a) Discuss in brief about the factors affecting fermentation process.

Or

(b) Explain the components of fermentors.

12. (a) Explain the objectives of medium agitation and foam control.

Or

(b) Give a brief note on media formulation.

13. (a) Explain in brief about gene transfer technology.

Or

(b) Write short notes on monoclonal antibody.

14. (a) Describe the synthesis of biomass.

Or

(b) Explain the process involving the synthesis of peptides.

15. (a) Discuss the role of phosphatases in research industry.

Or

(b) Describe the application of protease in food industries.

2 **F–2986**

Part C (3 × 10 = 30)

Answer any **three** questions.

16. Discuss in detail about the various downstream processes for the purification of products.

17. Describe the various methods of enzyme immobilization.

18. Elaborate on hybridoma technology.

19. Describe the synthesis of growth hormones.

20. Discuss the role of streptokinase and urokinases in medical industry.

———————————

F–2986

F–2988	Sub. Code
	7MBC2E3

M.Sc. DEGREE EXAMINATION, NOVEMBER 2019

Second Semester

Biochemistry

Elective – BIOSTATISTICS AND BIOINFORMATICS

(CBCS – 2017 onwards)

Time : 3 Hours   Maximum : 75 Marks

Part A $(10 \times 2 = 20)$

Answer **all** questions.

1. Mention the significance of statistics.

2. Define Skewness.

3. What is the probability that there are 53 sundays in a leap year?

4. Define combination.

5. What is standard error?

6. What is paired t test?

7. Define substitution matrix.

8. What is sequence alignment?

9. What is docking?

10. Define toxicogenomics.

Part B (5 × 5 = 25)

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

11. (a) Explain the various diagrammatic representations to present statistical data.

Or

(b) In an examination, 10 students obtained the following marks in Biochemistry and Microbiology. Find the coefficient of rank correlation.

Biochemistry 90 30 82 45 32 65 40 88 73 66

MIcrobiology 85 42 75 68 45 63 60 90 62 58

12. (a) Explain the theorems of probability.

Or

(b) Obtain the binomial distribution for which the mean is 20 and the variance is 15.

13. (a) Present the parts of an manuscript for publication.

Or

(b) Give an account on the types of design and experiments.

14. (a) Comment on homology modelling.

Or

(b) Write notes on Gen Bank's feature locations.

15. (a) Give an account on Pharmacogenomics.

Or

(b) Explain the steps for building a tree using maximum Parsimony method.

2 **F–2988**

Part C $(3 \times 10 = 30)$

Answer any **three** questions.

16. Calculate the mean, median, S.D and coefficient of variation from the following data.

Class Interval:	10–19	20–29	30–39	40–49	50–59	60–69	70–79
Frequency:	5	19	10	13	4	4	2

17. What is normal distribution? Point out its properties, constants and importance.

18. Discuss the Chi – Square test of goodness of fit of a theoretical distribution to an observed frequency distribution. Also state the conditions for the validity of χ^2 test.

19. Write an essay on the tools used for the comparision of DNA sequences.

20. Discuss the role of BCAST in homology and similarity search of DNA.

—————————

F–2988

F–2990

M.Sc. DEGREE EXAMINATION, NOVEMBER 2019

Third Semester

Biochemistry

MEDICAL BIOCHEMISTRY

(CBCS – 2017 onwards)

Time : 3 Hours   Maximum : 75 Marks

Part A   (10 × 2 = 20)

Answer **All** questions.

1.   Mention the significance of HbA 1c test.

2.   What is Crigler–Najjar syndrome?

3.   What is atherosclerosis?

4.   What are seromycoproteins?

5.   Differentiate Diabetes mellitus and Diabetes insipidus.

6.   Write the composition of amniotic fluid.

7.   Write the significance of C-reactive protein as a biochemical marker.

8.   Mention the diagnostic importance of ketone bodies in urine.

9.   What is lactose intolerance?

10. Differentiate primary and secondary gout.

Part B (5 × 5 = 25)

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

11. (a) Write a note on the secondary degenerative changes associated with diabetes mellitus.

Or

(b) Explain the experimental induction of hypercholesterolemia in animals.

12. (a) Write a note on the biochemical findings in chronic glomerulonephritis.

Or

(b) Briefly describe the laboratory tests for hemodialysis.

13. (a) Give an account on the diagnostic significance of LDH isoenzymes.

Or

(b) Write a note on the pattern of CPK in health and disease.

14. (a) Mention the tests for screening sickle cell anemia.

Or

(b) Write a note on hepatic coma.

15. (a) Discuss the variations in plasma proteins in multiple mycloma.

Or

(b) Write a note on Fanconi syndrome.

2 **F – 2990**

Part C (3 × 10 = 30)

Answer any **three** questions.

16. Give a detailed account of the units used in expressing clinical values and standard solutions.

17. Discuss in detail the disorders associated with amino acids tyrosine and phenyl alamine.

18. Write a detailed account of glycogen storage diseases.

19. Discuss on the various tests to assess renal function.

20. Describe the different types of jaundice and discuss the laboratory findings in jaundice.

_____

F – 2990

F-2991

M.Sc. DEGREE EXAMINATION, NOVEMBER 2019

Third Semester

Biochemistry

MOLECULAR BIOLOGY

(CBCS – 2017 onwards)

Time : 3 Hours　　　　　　　Maximum : 75 Marks

Part A　　　　　$(10 \times 2 = 20)$

Answer **all** questions.

1.　What are pseudogenes?

2.　What are Okazaki fragments?

3.　What are competent cells?

4.　Differentiate general and specialized transduction.

5.　What is gene frequency?

6.　Mention the role of helicase and SSB proteins in DNA replication.

7.　What is chromatin condensation?

8.　What are transposons?

9.　Highlight the function of homeotic genes.

10.　Outline the central dogma of molecular biology.

Part B (5 × 5 = 25)

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

11. (a) Write a note on the inhibitors of DNA replication.

Or

(b) Write a note on the properties of genetic code.

12. (a) Write a note on deletion mapping.

Or

(b) Mention the need for isogenic strains in genetic analysis.

13. (a) Write a note on the discovery and types of transposable elements.

Or

(b) Give an account of triparental mating.

14. (a) Explain Hard Weinberg's law and add a note on its application.

Or

(b) Write a note on sex determination in drosophila.

15. (a) Mention the differences between satellite DNA and mobile DNA.

Or

(b) Write a note on bacterial insertion sequences.

Part C (3 × 10 = 30)

Answer any **three** questions.

16. Explain with suitable illustrations the structure and organization of eukaryotic chromosomes.

17. Discuss in detail the mechanism of translation in prokaryotes.

F-2991

18. Describe the different methods of gene transfer in bacteria.

19. Justify the role of *C.elegans* as a model organism in the study of developmental genetics.

20. Explain genetic recombination with suitable example.

————————

3   **F-2991**

F–2992

Sub. Code
7MBC3E3

M.Sc. DEGREE EXAMINATION, NOVEMBER 2019

Third Semester

Biochemistry

Elective – HORMONES AND CELL SIGNALING

(CBCS – 2017 onwards)

Time : 3 Hours　　　　　　　　Maximum : 75 Marks

Part A　　　　　　$(10 \times 2 = 20)$

Answer **all** questions.

1. What is iodothyronine?

2. What is serotonin?

3. Mention the physiological role of G protein coupled receptor.

4. Is G- protein a second messenger?

5. Define chemokine.

6. What is Calmodulin?

7. Where are TSH receptors located?

8. How do steroid hormones bind to cytosolic receptors?

9. What is familial hypercalcemia?

10. Define activating mutation.

Part B $(5 \times 5 = 25)$

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

11. (a) Present the mechanism of action of peptide hormone.

Or

   (b) Write notes on the types of receptors.

12. (a) "G" protein coupled receptors are attractive targets for magic bullets- Substantiate.

Or

   (b) Enumerate on the consequences of G protein mutations in human.

13. (a) Explain the structure of tyrosine kinase recptor.

Or

   (b) Discuss the initiation of signal transduction by inositol triphosphate.

14. (a) Give an account on nuclear hormone receptors.

Or

   (b) Comment on hormone response elements.

15. (a) Write notes on TSH receptor mutations.

Or

   (b) Highlight on the type II diabetes millelin .

2   **F–2992**

Part C (3 × 10 = 30)

Answer any **three** questions.

16. Illustrate the Classification of hormones based on its action.

17. Write an essay on the structure functional relationship of G protein coupled receptor.

18. Describe in brief the signaling cascade involving cyclic AMP.

19. Discuss the regulation of gene transcription by interaction of steroid receptors.

20. Write an essay on different inactivating gene mutations of receptors with examples.

————————

F–2992