D 11607 (Pages : 2) Name.....

Reg. No.....

THIRD SEMESTER M.Sc. DEGREE (REGULAR/SUPPLEMENTARY) EXAMINATION, NOVEMBER 2021

(CBCSS)

Biochemistry

BCH 3E 02—PROTEIN CHEMISTRY

(2019 Admission onwards)

Time : Three Hours Maximum : 30 Weightage

General Instructions

1. *In cases where choices are provided, students can attend* **all** *questions in each section.*
2. *The minimum number of questions to be attended from the Section / Part shall remain the same.*
3. *The instruction if any, to attend a minimum number of questions from each sub section / sub part / sub division may be ignored.*
4. *There will be an overall ceiling for each Section / Part that is equivalent to the maximum weightage of the Section / Part.*

Section A (Short Answer Type)

Answer any **four** *questions.*
Each question carries a weightage of 2.

1. Brief on biological amines and their functions.
2. Define specific activity of an enzyme.
3. Write the role of protein in defensive mechanism of the body.
4. How are protein samples prepared for PAGE ?
5. Define Circular Dichroism.
6. Brief on DDJB.
7. Write the basic principle behind NMR spectroscopy.

(4 × 2 = 8 weightage)

Section B (Short Essay Type)

Answer any **four** *questions.*
Each question carries a weightage of 3.

8. Write about protein data bases.
9. Explain 2-D gel electrophoresis.

Turn over

10. Discuss about the features of an active site.
11. Explain how organelles are separated by ultracentrifugation.
12. How are amino acids classified ?
13. Discuss about the physiochemical properties of proteins.
14. Give an account of LB plot and its significance.

(4 × 3 = 12 weightage)

Section C (Essay Type)

Answer any **two** *questions.*
Each question carries 5 *weightage.*

15. Discuss about the structural determination of protein using X-ray diffraction and NMR.
16. Explain the technique of PAGE.
17. Discuss about the different types of enzyme inhibition.
18. Give a detailed account of the different levels of structural organization of protein.

(2 × 5 = 10 weightage)

D 11606 (Pages : 2) Name.....

Reg. No.....

THIRD SEMESTER M.Sc. DEGREE (REGULAR/SUPPLEMENTARY) EXAMINATION, NOVEMBER 2021

(CBCSS)

Biochemistry

BCH 3E 01—NEURO BIOCHEMISTRY

(2019 Admission onwards)

Time : Three Hours Maximum : 30 Weightage

General Instructions

1. *In cases where choices are provided, students can attend* **all** *questions in each section.*
2. *The minimum number of questions to be attended from the Section / Part shall remain the same.*
3. *The instruction if any, to attend a minimum number of questions from each sub section / sub part / sub division may be ignored.*
4. *There will be an overall ceiling for each Section / Part that is equivalent to the maximum weightage of the Section / Part.*

Part A (Short Answers)

Answer any **four** *questions.*
Each question carries 2 *weightage.*

1. What is a nerve fibre ?
2. What is the function of blood brain barrier ?
3. Define the term 'action potential'.
4. Explain the characteristics of cerebrospinal fluid.
5. What is the function of synapse ?
6. Explain the term 'muscular dystrophy'.
7. What are hallucinogenic agents ?

(4 × 2 = 8 weightage)

Part B (Short Essays)

Answer any **four** *questions.*
Each question carries 3 *weightage.*

8. Discuss on cerebral cortex.
9. Write short notes on EEG patterns.

Turn over

10. Write briefly on the structure of synapse.

11. Discuss on myoneural junction.

12. Give an account on antidepressants.

13. Discuss on senile dementia.

14. Give a brief note on glycogen storage diseases.

(4 × 3 = 12 weightage)

Part C (Long Essays)

Answer any **two** *questions.*
Each question carries 5 *weightage.*

15. Give an account on the classification of neuron.

16. Discuss in detail the chemistry and metabolism of major brain lipids.

17. Outline the post and pre synaptic events.

18. Write an essay on neurotoxic agents and the diseases related to them.

(2 × 5 = 10 weightage)

D 11605 (Pages : 2) Name.....

Reg. No.....

THIRD SEMESTER M.Sc. DEGREE (REGULAR/SUPPLEMENTARY) EXAMINATION, NOVEMBER 2021

(CBCSS)

Biochemistry

BCH 3C 03—GENETICS, RDNA TECHNOLOGY AND IPR

(2019 Admission onwards)

Time : Three Hours Maximum : 30 Weightage

General Instructions

1. *In cases where choices are provided, students can attend* **all** *questions in each section.*
2. *The minimum number of questions to be attended from the Section / Part shall remain the same.*
3. *The instruction if any, to attend a minimum number of questions from each sub section / sub part / sub division may be ignored.*
4. *There will be an overall ceiling for each Section / Part that is equivalent to the maximum weightage of the Section / Part.*

Part A (Short Answer)

Answer any **four** *questions.*
Each question carries 2 *weightage.*

1. What is crossing over ?
2. What is a phage vector ?
3. Define Totipotency.
4. Give two examples of antibiotics.
5. What is a Biofilm ?
6. Expand the abbreviation 'UPOV'.
7. Define the term 'copy right'.

(4 × 2 = 8 weightage)

Turn over

Part B (Short Essay)

Answer any **four** *questions.*
Each question carries 3 weightage.

8. Discuss on human artificial chromosomes.
9. Write short notes on restriction endonuclease.
10. Write briefly on the composition of MS medium.
11. Discuss on transgenic animals.
12. Give an account on biosensors.
13. Discuss on GAAT.
14. Give a brief note on patent office practice.

(4 × 3 = 12 weightage)

Part C (Long Essay)

Answer any **two** *questions.*
Each question carries 5 weightage.

15. Write an essay on gene transfer in bacteria.
16. Discuss in detail the various gene transfer methods.
17. Outline the large scale production of secondary metabolites using tissue culture.
18. Write an essay on Intellectual property rights.

(2 × 5 = 10 weightage)

D 11604 (Pages : 2) Name.....

Reg. No.....

THIRD SEMESTER M.Sc. DEGREE (REGULAR/SUPPLEMENTARY) EXAMINATION, NOVEMBER 2021

(CBCSS)

Biochemistry

BCH 3C 02—PHYSIOLOGY AND ENDOCRINOLOGY

(2019 Admission onwards)

Time : Three Hours Maximum : 30 Weightage

General Instructions

1. *In cases where choices are provided, students can attend* **all** *questions in each section.*
2. *The minimum number of questions to be attended from the Section / Part shall remain the same.*
3. *The instruction if any, to attend a minimum number of questions from each sub section / sub part / sub division may be ignored.*
4. *There will be an overall ceiling for each Section / Part that is equivalent to the maximum weightage of the Section / Part.*

Part A (Short Answers)

Answer any **four** *questions.*
Each question carries 2 weightage.

1. List out the cellular components of blood.
2. Write about hypercapnia and apnea.
3. What are pheromones ?
4. Brief on alveolar ventilation.
5. Write a short note on olfactory receptors.
6. Name any four clinical conditions associated with thyroid hormones.
7. Write a short note on functions of saliva.

(4 × 2 = 8 weightage)

Part B (Short Essays)

Answer any **four** *questions.*
Each question carries 3 weightage.

8. Write about achlorhydria and gastritis.
9. Give a brief account of the role of calcium in hormonal signalling.

Turn over

10. Write about glomerular filtration.
11. Brief on the dwarfism, acromegaly and gigantism.
12. Discuss about haematopoiesis.
13. Brief on blood transfusion.
14. Discuss about the structure and functions of eye.

(4 × 3 = 12 weightage)

Part C (Long Essays)

Answer any **two** *questions.*
Each question carries 5 *weightage.*

15. Describe the mechanism of nerve impulse transmission.
16. Give a detailed account of adrenal hormone disorders.
17. Discuss in detail the mechanism of blood clotting and related disorders.
18. Give a detailed account of the regulation of signalling pathways.

(2 × 5 = 10 weightage)

D 11603 (Pages : 2) Name.....

Reg. No.....

THIRD SEMESTER M.Sc. DEGREE (REGULAR/SUPPLEMENTARY) EXAMINATION, NOVEMBER 2021

(CBCSS)

Biochemistry

BCH 3C 01—METABOLIC REGULATION AND BIOENERGETICS

(2019 Admission onwards)

Time : Three Hours Maximum : 30 Weightage

General Instructions

1. *In cases where choices are provided, students can attend* **all** *questions in each section.*
2. *The minimum number of questions to be attended from the Section / Part shall remain the same.*
3. *The instruction if any, to attend a minimum number of questions from each sub section / sub part / sub division may be ignored.*
4. *There will be an overall ceiling for each Section / Part that is equivalent to the maximum weightage of the Section / Part.*

Part A (Short Answer)

Answer any **four** *questions.*
Each question carries 2 weightage.

1. Define Gibbs free energy. How is it related to spontaneity of a reaction ?
2. Name one enzyme and its coenzyme involved in biological oxidation reduction reactions.
3. List out two allosteric regulators of glycolysis.
4. How is redox potential significance in energy generation ?
5. Why is phosphofructokinase rather than hexokinase the pacemaker of glycolysis ?
6. Give the committed step of cholesterol biosynthesis.
7. Define anaplerosis. Cite an example.

(4 × 2 = 8 weightage)

Part B (Short Essay)

Answer any **four** *questions.*
Each question carries 3 weightage.

8. Name the defective enzyme in Fructosuria, Von Gierki's disease and Pomp's disease.
9. How is galactose catabolized ?
10. Discuss the coordinated regulation of glycogen breakdown and synthesis by glucagon.
11. Brief on synthesis of phospholipids.
12. Give a schematic representation of synthesis of prostaglandins and leukotrienes.
13. Name the disease caused by defective Sphingomyelinase, Hexosaminidase A and β-glucosidase.
14. Describe the mechanism of electron transfer from two electron carrier Q to one electron carrier cytochrome c in ETC.

(4 × 3 = 12 weightage)

Part C (Long Essay)

Answer any **two** *questions.*
Each question carries 5 weightage.

15. Discuss the steps involved in catabolism of branched chain amino acids.
16. Elaborate the breakdown of cholesterol.
17. Write down the steps involved in catabolism of phenylalanine.
18. Explain the mechanism by which proton gradient across mitochondrial membrane result in ATP synthesis.

(2 × 5 = 10 weightage)

D 11343 (Pages : 2) Name.....

Reg. No.....

THIRD SEMESTER M.Sc. DEGREE (SUPPLEMENTARY) EXAMINATION NOVEMBER 2021

(CUCSS)

Biochemistry

BC 3C 08—MOLECULAR BIOLOGY, GENETIC ENGINEERING, PATENTING AND IPR

(2013 to 2018 Admissions)

Time : Three Hours Maximum : 36 Weightage

Section A

Answer any **fourteen** *questions.*
Each question carries a weightage of 1.

1. Differentiate between introns and exons.
2. Write about mitochondrial DNA.
3. What is reverse PCR ?
4. Write about BACs.
5. Brief on attenuation.
6. What are overlapping genes ?
7. List the components of a lac operon.
8. What are cloning vectors ?
9. Write a brief note on split genes.
10. Mention about UPOV convention.
11. Brief on TRIPS.
12. What is long PCR ?
13. Write a short note on Vector engineering.
14. Brief on quantitative PCR.
15. Write a short note on nucleosomes.
16. Write a brief note on synthetic oligonucleotide probes.

(14 × 1 = 14 weightage)

Turn over

Section B

Answer any **seven** *questions.*
Each question carries a weightage of 2.

17. Discuss about the patentability of micro-organisms.
18. Brief on RAPD.
19. Give a brief description on colony hybridization.
20. Give an account of the general requirements and principles of patent law.
21. Explain FISH.
22. Give a brief account of the characteristics of genetic code.
23. Explain the role of histones in gene expression.
24. Discuss about nucleic acid microarray.
25. Write about role of use of Ti plasmid in generating transgenic plants.

(7 × 2 = 14 weightage)

Section C

Answer any **two** *questions.*
Each question carries a weightage of 4.

26. Give a detailed account of different types of PCR.
27. Discuss about the patentability of inanimate products of nature.
28. Explain the construction of DNA libraries.

(2 × 4 = 8 weightage)

D 11187 (Pages : 2) Name.....

Reg. No.....

THIRD SEMESTER P.G. DEGREE EXAMINATION, NOVEMBER 2021

(CCSS)

Biochemistry

BCH 3C 03—MOLECULAR BIOLOGY AND GENETICS

(2019 Admissions)

Time : Three Hours Maximum : 80 Marks

Part A

Answer **all** *the questions.*
Each question carries 2 *marks.*

1. What do you mean by processivity of DNA polymerase ?
2. What is the end replication problem of linear DNA ?
3. Give an account of sigma factors.
4. State the reaction catalysed by telomerase.
5. What are composite transposons.
6. What is the function of aminoacyl tRNA synthases ?
7. What is the importance of Shine -Dalgarno sequence ?
8. What do you mean by gene silencing ?
9. Explain Ames test.
10. Name two chemical mutagens and describe their action.
11. How are thymidine dimers repaired ?
12. What do you mean by extra chromosomal inheritance?
13. Explain dosage compensation in Drosophila.
14. What do you mean by genetic drift ?
15. What is a split gene ?
16. What is a pedigree analysis ? What are its applications in humans ?

17. What do you mean by chromosome walking.

18. What are the genes in the lactose operon and, give the names of the enzymes expressed by them ?

19. Differentiate between genotype and phenotype.

20. Explain rho dependent termination of transcription in prokaryotes.

(20 × 2 = 40 marks)

Part B

Answer any **five** *questions.*
Each question carries 8 *marks.*

21. Write an essay on recombinalion.

22. Describe nucleotide excision repair, base excision repair and mismatch repair pathways.

23. Give an account of human genome project.

24. Describe processing of mRNA in eukaryotes.

25. Describe initiation of replication in prokaryotes and its regulation.

26. Compare the termination of translation in prokaryotes and eukaryotes.

27. Describe Mendel's-experiment. What are the three laws of inheritance proposed by Mendel ?

(5 × 8 = 40 marks)

D 11186 (Pages : 2) Name.....

Reg. No.....

THIRD SEMESTER P.G. DEGREE EXAMINATION, NOVEMBER 2021

(CCSS)

Biochemistry

BCH 3C 02—PHYSIOLOGY AND DEVELOPMENTAL BIOLOGY

(2019 Admissions)

Time : Three Hours Maximum : 80 Marks

Section A

Answer **all** *the following in 2* **or** *3 sentences each.*
Each question carries 2 marks.

1. What is the mechanism of action of cryptochrome ?
2. Narrate the photoreceptor which is responsible for red and far-red wavelengths of light ?
3. Which hormone is responsible for photoperiodism and name three classes of photoperiodism ?
4. What are the two main ways the plants gets reduced nitrogen ?
5. How are nutrient transport through sieve tubes of phloem ?
6. Define chloride shift.
7. Give the significance of oxygen dissociation curve.
8. What are the abnormal constituents of urine ?
9. Define polyspermy and give the mechanism by which egg prevent polyspermy.
10. List the hormones involved in gametogenesis and give their roles.
11. What do you meant by heart cycle ?
12. What is the fate of endoderm layer ?
13. Mention role of TGF-β in the development of organs.
14. State the different types of cleavage.
15. Comment on the role of radical and cotyledons in the process of germination.
16. Give the structure of female gametophyte.
17. What do you meant by seed dormancy ?
18. Give the structure of monocot embryo.
19. What is the difference between cell cycle and cell division ?
20. Differentiate autonomous and conditional specification.

(20 × 2 = 40 marks)

Turn over

Section B

Answer any **five** *of the following.*
Each question carries 8 *marks.*

21. Explain the functions of different plant hormones.

22. Discuss on the major differences between C3 and C4 photosynthesis.

23. Explain the structure of a sperm with a diagram and delineate the function of each structural part towards fertilization of an egg.

24. Discuss the role of hemoglobin in the transport of carbon dioxide during respiration.

25. Explain the role of FGF signal transduction pathway in organ development.

26. Explain the structure and function of shoot apical meristem.

27. Discuss on the role of genes in pattern development in animal and plant embryo.

(5 × 8 = 40 marks)

D 11185 (Pages : 2) Name.....

Reg. No.....

THIRD SEMESTER P.G. DEGREE EXAMINATION, NOVEMBER 2021

(CCSS)

Bio-chemistry

BCH 3C 01—METABOLISM AND REGULATION

(2019 Admissions)

Time : Three Hours Maximum : 80 Marks

Part A

Answer **all** *the questions.*
Each question carries 2 *marks.*

1. Differentiate between oxidation and reduction.
2. Explain a group transfer reaction with an example.
3. Give an example on the usage of inhibitors to study metabolic pathways ?
4. How can you use radio isotopes to trace the metabolic pathways in isolated organs ?
5. State the metabolic role of HMP pathway.
6. How is galactose metabolized in our body ?
7. What is the role of ubiquitin in protein degradation?
8. What is the biochemical defect in phenylketonuria ?
9. Cori cycle is more prevalent under anaerobic conditions. Comment on this statement.
10. How does ATP serve as high energy compound ?
11. Explain the regulation of Urea cycle.
12. How is nitric oxide biosynthesised ?
13. What are lipoxins ?
14. What are uncouplers ? Give examples.
15. What are the degradation products of heme ?
16. Describe allosteric control of glycogen synthase.
17. State the function of inorganic polyphosphates.
18. Write the reactions affected by following inhibitors : (a) Arsenate ; and (b) Fluoride.

19. Write a note on Niemann-Pick disease.

20. What are leukotrienes ?

(20 × 2 = 40 marks)

Part B

Answer any **five** *questions.*

Each question carries 8 *marks.*

21. List the components of electron transport chain and explain the mechanism of ATP synthesis.

22. Describe cholesterol synthesis and its regulation.

23. Briefly describe TCA cycle and its regulation

24. Explain the biodegradation of aromatic amino acids.

25. Describe regulation of fatty acid metabolism.

26. Give an account of one carbon metabolism associated with amino acid and nucleic acid metabolism.

27. Describe regulation of gluconeogenesis.

(5 × 8 = 40 marks)