

## SIXTH SEMESTER U.G. DEGREE EXAMINATION, MARCH 2022

(CBCSS-UG)

Zoology

ZOL 6B 14 T (E03)—APPLIED ENTOMOLOGY

(2019 Admissions)

Time : Two Hours

Maximum : 60 Marks

**Section A***Answer atleast **eight** questions.**Each question carries 3 marks.**All questions can be attended.**Overall ceiling 24.*

1. Name any *two* pests of domestic animals.
2. What is autocidal control ?
3. Mention the scientific name of : (a) Sugar cane shoot borer and (b) Red palm weevil.
4. What is insecticide residue ? Mention its impact on the environment.
5. Name any *two* pesticide appliances.
6. Explain the uses of lac.
7. How will you control mango stem borer ?
8. What is 'pollu beetle' ? Explain the damage caused by it.
9. Name any *two* botanical insecticides and plants from which they are derived.
10. Write notes on tea mosquito bug.
11. What are the uses of honey ?
12. Mention the major reasons for pest outbreak.

(8 × 3 = 24 marks)

**Turn over**

**Section B**

*Answer atleast five questions.*

*Each question carries 5 marks.*

*All questions can be attended.*

*Overall ceiling 25.*

13. Write an account on the different species of silk worms in India.
14. Discuss the relevance of biological control in the present scenario. Cite major bio-control projects undertaken in India.
15. Explain the role played by insects in medicine and forensic science.
16. Give an account on cultivation, harvesting and propagation of lac insect.
17. Write an account on pests of stored products.
18. Classify insecticides based on mode of action.
19. Define 'pest'. Explain different kinds of pests citing examples.

(5 × 5 = 25 marks)

**Section C**

*Answer any one questions.*

*Each question carries 11 marks.*

20. Write an essay on the life cycle, damage and control measures of any two pests of paddy.
21. Write an account on social life and adaptations of honey bees.

(1 × 11 = 11 marks)

**SIXTH SEMESTER U.G. DEGREE EXAMINATION, MARCH 2022**

(CBCSS—UG)

Zoology

ZOL 6B 14 T (E02)—AQUACULTURE, ANIMAL HUSBANDRY AND POULTRY SCIENCE

(2019 Admissions)

Time : Two Hours

Maximum : 60 Marks

**Section A (Short Answer Questions)***Answer at least **eight** questions.**Each question carries 3 marks.**All questions can be attended.**Overall Ceiling 24.*

1. Name any *two* species of culture prawns in a India
2. Write a short note on dual purpose cattle breeds.
3. Enumerate the significance of grit in poultry.
4. What are the different types of cultch materials used in bivalve culture ?
5. Give a brief account on white revolution.
6. What is mother of pearl ?
7. Enlist the clinical symptoms of foot and mouth disease.
8. What are the major ingredients used as energy source in poultry feed ?
9. Differentiate monoculture and polyculture practices.
10. Write on the harmful effects of artificial milk.
11. What is a Cryoprotectant ? Give two examples.
12. Comment on the benefits of deep litter system.

(8 × 3 = 24 marks)

**Turn over**

**Section B (Paragraph Questions)**

*Answer at least five questions.*

*Each question carries 5 marks.*

*All questions can be attended.*

*Overall Ceiling 25.*

13. Briefly explain the commercial importance of Green chromide.
14. Discuss on the code of practice in meat hygiene.
15. Give an account on fungal infections among cultured fishes.
16. Explain the significance of eyestalk ablation in aquaculture.
17. Write a note on acoustic devices used in capture fisheries.
18. Discuss the rearing and management of growers and layers in poultry keeping.
19. Write on the present status of Sardine fishery of India.

(5 × 5 = 25 marks)

**Section C (Essay Questions)**

*Answer any one question.*

*The question carries 11 marks.*

20. Write an essay on the steps involved in canning method of fish preservation.
21. Write an account on prawn culture methods in India.

(1 × 11 = 11 marks)

**SIXTH SEMESTER U.G. DEGREE EXAMINATION, MARCH 2022**

(CBCSS-UG)

Zoology

ZOL 6B 14 T (E01)—HUMAN GENETICS

(2019 Admissions)

Time : Two Hours

Maximum : 60 Marks

**Section A***Answer atleast **eight** questions.**Each question carries 3 marks.**All questions can be attended.**Overall ceiling 24.*

1. Write on chromosome banding.
2. Explain mosaicism.
3. Write on Karyotyping.
4. Briefly explain ASD in human.
5. Write on symbols of pedigree.
6. Comment on inheritance of intelligence.
7. Write on maternal effect genes.
8. Explain genetic sequencing.
9. Explain genomic imprinting.
10. Briefly account on human haplogroups.
11. What is phenocopy ?
12. Write on ethical aspect of genetic counselling.

(8 × 3 = 24 marks)

**Turn over**

**Section B**

*Answer atleast five questions.*

*Each question carries 5 marks.*

*All questions can be attended.*

*Overall ceiling 25.*

13. Write notes on errors in sexual development.
14. Explain briefly the biology of twinning and twin analysis.
15. Give a note on segmentation genes.
16. Describe the outcome of various conferences connected with classification of human chromosomes and their nomenclature.
17. Write briefly on chromosome structural modifications in human.
18. How to construct pedigree of sex-linked gene mutations disorders ?
19. What are the characteristics of various groups of human chromosomes ?

(5 × 5 = 25 marks)

**Section C**

*Answer any one questions.*

*Each question carries 11 marks.*

20. Write an essay on various steps involved in genetic counselling.
21. Describe different types of chromosomal disorders in human.

(1 × 11 = 11 marks)

**SIXTH SEMESTER U.G. DEGREE EXAMINATION, MARCH 2022**

(CBCSS—UG)

Zoology

ZOL 6B 13 T—ETHOLOGY, EVOLUTION AND ZOO GEOGRAPHY

(2019 Admissions)

Time : Two Hours

Maximum : 60 Marks

**Section A***Answer at least **eight** questions.**Each question carries 3 marks.**All questions can be attended.**Overall Ceiling 24.*

1. Explain taxes with examples.
2. What is photoperiodism ?
3. Write notes on homing instinct.
4. What is bipolar distribution ? Give an example.
5. Mention the role of hypothalamus in thirst and feeding.
6. What are continental islands ? Give an example.
7. What is Wallace line ?
8. Write briefly on Cambrian Explosion.
9. What is fossil dating ? Suggest one major fossil dating method.
10. How will you distinguish subspecies from semispecies ?
11. What are the main features of Australopithecus ?
12. What is anagenesis ?

(8 × 3 = 24 marks)

**Turn over**

**Section B**

*Answer at least **five** questions.*

*Each question carries 5 marks.*

*All questions can be attended.*

*Overall Ceiling 25.*

13. What is learned behavior ? Explain the various types of learned behaviour.
14. Write an account on social life in termites.
15. Explain the barriers in animal distribution.
16. Describe the morphological and anatomical evidences of organic evolution.
17. Explain Darwin's theory of natural selection.
18. Describe the theory of genetic drift and comment on its evolutionary significance.
19. What is adaptive radiation ? Explain with suitable examples.

(5 × 5 = 25 marks)

**Section C (Essay)**

*Answer any **one** question.*

*The question carries 11 marks.*

20. Write an essay on isolating mechanisms. Add a note on its role in evolution.
21. Discuss the biochemical origin of life.

(1 × 11 = 11 marks)



**SIXTH SEMESTER U.G. DEGREE EXAMINATION, MARCH 2022**

(CBCSS—UG)

Zoology

ZOL 6B 12 T—ENVIRONMENTAL AND CONSERVATION BIOLOGY

(2019 Admissions)

Time : Two Hours

Maximum : 60 Marks

**Section A (Short Answer Questions)***Answer at least **eight** questions.**Each question carries 3 marks.**All questions can be attended.**Overall Ceiling 24.*

1. What are ecological indicators ? Give an example.
2. What are Key stone species ?
3. Briefly mention the thermal stratification in pond.
4. Write briefly on management of landslides.
5. What is radio collaring and write its application in animal census.
6. Differentiate between Gross Primary Productivity and Net Primary Productivity.
7. What is the importance of Ramsar Convention ?
8. Write a note on Shannon's diversity index.
9. What is LD50 value and write its significance.
10. What is Demecology ?
11. Explain edge effect.
12. What is lotic ecosystem ? Give an example.

(8 × 3 = 24 marks)

**Turn over**

**Section B (Paragraph Questions)**

*Answer at least five questions.*

*Each question carries 5 marks.*

*All questions can be attended.*

*Overall Ceiling 25.*

13. Describe the Lindeman's model of energy flow.
14. Write a note on the ecological significance of mangrove ecosystem.
15. Discuss the various properties of a population.
16. Write an account on sustainable development and its significance.
17. Describe the various methods used for trapping and collection of insects.
18. Write the significance of Red data book and enlist the IUCN red list categories.
19. Write an account of hot spots of biodiversity in India.

(5 × 5 = 25 marks)

**Section C (Essay Questions)**

*Answer any one question.*

*The question carries 11 marks.*

20. Write an essay on different forms of Population Interactions.
21. Describe the various threats to biodiversity.

(1 × 11 = 11 marks)

## SIXTH SEMESTER U.G. DEGREE EXAMINATION, MARCH 2022

(CBCSS—UG)

Zoology

ZOL 6B 11—REPRODUCTIVE AND DEVELOPMENTAL BIOLOGY

Time : Two Hours

Maximum : 60 Marks

**Section A (Short Answers)***Answer atleast **eight** questions.**Each question carries 3 marks.**All questions can be attended.**Overall Ceiling 24.*

1. Define germplasm theory.
2. Write a note on oestrous cycle in mammals.
3. Explain capacitation of sperm.
4. Comment on facultative parthenogenesis.
5. Differentiate GIFT and ZIFT.
6. What is corpus albicans ?
7. Comment on embryo transfer.
8. Briefly explain cell lineage in Planocera.
9. With the help of neat labeled diagram explain Graafian follicle.
10. Give a short note on functions of placenta.
11. Briefly describe pluripotency.
12. Comment on organizer and induction.

(8 × 3 = 24 marks)

**Turn over**

**Section B (Short Answers)**

*Answer atleast five questions.*

*Each question carries 5 marks.*

*All questions can be attended.*

*Overall Ceiling 25.*

13. Define cleavage. How cleavages are classified ?
14. Briefly explain menstrual cycle and its hormonal control.
15. Explain different types of prenatal diagnostic techniques.
16. With the help of neat labeled diagram, describe the salient features of 24 hour chick embryo.
17. Briefly describe different Teratogenic agents.
18. Describe gradient experiments in Sea Urchin eggs.
19. Explain the significance and applications of embryonic stem cells.

(5 × 5 = 25 marks)

**Section C (Essay)**

*Answer any one questions.*

*Each question carries 11 marks.*

20. Classify the eggs based on the amount and distribution of yolk. Give a detailed description on each class of eggs. Add a note on functions of egg envelopes.
21. Explain morphogenetic movement and formation of germ layers in frog.

(1 × 11 = 11 marks)

**SIXTH SEMESTER U.G. DEGREE EXAMINATION, MARCH 2022**

(CBCSS—UG)

Zoology

ZOL 6B 10 T—PHYSIOLOGY AND ENDOCRINOLOGY

(2019 Admissions)

Time : Two Hours

Maximum : 60 Marks

**Section A***Answer at least **eight** questions.**Each question carries 3 marks.**All questions can be attended.**Overall Ceiling 24.*

1. What is reverse Bohr Effect ?
2. Explain Haematuria.
3. What are neurotransmitters ? Give any *two* examples.
4. What are anticoagulants ? Name any *two* of them.
5. What is muscle fatigue ?
6. Mention any *two* important physiological functions of calcium.
7. Explain the concept of balanced diet.
8. What are the functions of HCl in gastric juice ?
9. What do you mean by double circulation ?
10. What is juxtaglomerular apparatus ?
11. What are gastro intestinal hormones ? Give two examples.
12. What is Myocardial infarction ?

(8 × 3 = 24 marks)

**Turn over**

**Section B**

*Answer at least **five** questions.*

*Each question carries 5 marks.*

*All questions can be attended.*

*Overall Ceiling 25.*

13. Describe Ornithine cycle.
14. Explain the importance of fibres in food.
15. Write a note on ruminant digestion.
16. Explain Oxygen-hemoglobin dissociation curve. Add a note on its significance.
17. Give an account of pancreas and its endocrine function.
18. Describe the structure of electric organ. Comment on its major functions.
19. Write a note on hormones of reproduction.

(5 × 5 = 25 marks)

**Section C**

*Answer any **one** question.*

*The question carries 11 marks.*

20. Describe the ultra-structure of skeletal muscle fibre and explain the biochemical changes associated with muscle contraction.
21. Explain how a nerve impulse is conducted along a nerve fibre.

(1 × 11 = 11 marks)

**SIXTH SEMESTER (CUCBCSS-UG) DEGREE EXAMINATION, MARCH 2022**

## Zoology

## ZOL 6B 15 (E3)—APPLIED ENTOMOLOGY

(2014 to 2018 Admissions)

Time : Three Hours

Maximum : 80 Marks

**Part A**I. One word questions. Answer *all* questions. Each question carries 1 mark :

1. Scientific name of Rhinoceros beetle \_\_\_\_\_.
2. Housefly belongs to the Order \_\_\_\_\_.
3. Genus of mosquito that transmits malaria \_\_\_\_\_.
4. Insect associated with pollen basket \_\_\_\_\_.
5. Common name of *Aceria guerreronis* \_\_\_\_\_.
6. Insects belong to the Phylum \_\_\_\_\_.
7. Wingless insects are called \_\_\_\_\_.
8. Scientific name of pulse beetle \_\_\_\_\_.
9. Termites belongs to the order \_\_\_\_\_.
10. Common names of insect belonging to the Order Lepidoptera \_\_\_\_\_.

(10 × 1 = 10 marks)

**Part B**II. Write short note on any *ten* questions. Each question carries 2 marks :

11. Forensic Entomology.
12. Important insect pollinators.
13. Life cycle of one major pest of coconut.
14. Pheromone and its classification.
15. Organochlorine insecticides.
16. Biology of tea mosquito.
17. Type of silkworms.
18. Antenna of insect.
19. Salient features of Coleoptera.

**Turn over**

20. Important honeybee species.
21. Cultural control of insect pests.
22. Life cycle of *Dacus cucurbitae*.

(10 × 2 = 20 marks)

### Part C

III. Paragraph questions. Answer any *five* questions. Each question carries 6 marks :

23. Biology of three important insect pests of vegetable crops.
24. Differentiate between sericulture and moriculture.
25. Biology of two medically important vectors.
26. Gall forming insects.
27. Advantage of integrated pest management strategy in agriculture.
28. Classification of insecticides based on chemical compositions.
29. Impact of insecticides on man and environment.
30. Major biocontrol agents used insect pest management.

(5 × 6 = 30 marks)

### Part D

IV. Essay Questions. Answer any *two* questions. Each question carries 10 marks :

31. Discuss biological control and its advantages in pest management strategy.
32. Explain the biology and management of important stored-product pests.
33. Write an essay on the major insect vectors of human diseases and their control.
34. Explain the biology and management of important pests of paddy.

(2 × 10 = 20 marks)



**SIXTH SEMESTER (CUCBCSS-UG) DEGREE EXAMINATION, MARCH 2022****Zoology****ZOL 6B 15 (E2)—AQUACULTURE, ANIMAL HUSBANDARY AND POULTRY SCIENCE**

(2014 to 2018 Admissions)

Time : Three Hours

Maximum : 80 Marks

**Part A**I. One word Questions. Answer *all* questions :

- 1 Which is the most commonly used organic fertilizer in fish pond ?
- 2 Give an indigenous breed of fowl.
- 3 Name a commercially cultivable variety of fresh water prawn.
- 4 Write an example for a passive gear.
- 5 Which is the famous dairy breed of Gujarat ?
- 6 Name a live bearing ornamental fish.
- 7 Give a chemical adulterant which extends the shelf life of milk.
- 8 Which is the common culture method for mussel ?
- 9 Name the high grade collagen produced from the airbladder of certain fishes.
- 10 Give the name of a conventional cryoprotectant.

(10 × 1 = 10 marks)

**Part B**II. Short Answer Questions. Answer any *ten* :

- 11 What is polyculture ?
- 12 Comment on euryhaline and stenohaline organisms.
- 13 What is soft curd milk ?
- 14 What is a green feed rack ?
- 15 Differentiate dry and wet methods of sterilization.

**Turn over**

- 16 Enlist any *four* by-products from Tuna.
- 17 Write down the significance of debeaking the chicks.
- 18 Briefly explain the importance of ice in fish preservation.
- 19 Give the importance of grit in poultry.
- 20 Comment on any *two* live feeds used in pisciculture.
- 21 What is a zoonotic disease ? Give an example.
- 22 Discuss the different methods adopted in the sexing of chicks.

(10 × 2 = 20 marks)

### Part C

III. Paragraph Questions. Answer any *five* :

- 23 Write a short note on pokkali culture in Kerala.
- 24 Give an account on common feeds and fodder of cattle.
- 25 Enumerate the factors which influence mud bank formation along Kerala coast.
- 26 Discuss the common diseases in poultry.
- 27 Briefly explain the process of clean meat production.
- 28 Explain the significance of eyestalk ablation in shrimp culture.
- 29 Comment on battery system of poultry housing with its advantages.
- 30 Enumerate the economic importance of cattle in India.

(5 × 6 = 30 marks)

### Part D

IV. Essay Questions. Answer any *two* :

- 31 Write an essay on different breeds of exotic and indigenous breeds of fowls.
- 32 Explain different types of dairy processes.
- 33 Write an essay on the biology and culture of Indian major carps.
- 34 Give an account on different types of by-products from fishes.

(2 × 10 = 20 marks)

**SIXTH SEMESTER (CUCBCSS-UG) DEGREE EXAMINATION, MARCH 2022**

## Zoology

## ZOL 6B 15 (E1)—HUMAN GENETICS

(2014 and 2018 Admissions)

Time : Three Hours

Maximum : 80 Marks

**Part A**I. One word questions Answer *all* questions. Each question carries 1 mark :

- 1 The first chromosomal aberration was discovered by Lejeune and his colleagues (1959) who identified an extra small chromosome in fibroblast cultures from patients with \_\_\_\_\_ syndrome.
- 2 In 'G-banding' of chromosome 'G' represents \_\_\_\_\_.
- 3 Write the full form of SCID.
- 4 The individual variations in response to drugs is dealt in \_\_\_\_\_ branch of science.
- 5 Burkett's lymphoma is caused by \_\_\_\_\_ virus.
- 6 Dizygotic twins are called \_\_\_\_\_ twins.
- 7 Write the alphabetic symbol for long arm of chromosome.
- 8 Arrangement of chromosomes based size, centromere and banding pattern is called \_\_\_\_\_.
- 9 Which enzyme is mainly involved in programmed cell death ?
- 10 An abnormal chromosome that has two identical arms due to duplication of one arm is called \_\_\_\_\_.

(10 × 1 = 10 marks)

**Turn over**

**Part B**

II. Short answer questions. Answer any *ten* questions. Each question carries 2 marks :

- 11 Write short notes on biology of twinning.
- 12 What is fragile X-syndrome ?
- 13 Write short notes on FISH.
- 14 Write short notes on psychodynamics of genetic counseling.
- 15 Write short notes on amniocentesis.
- 16 What are the main resolutions of Chicago conference on chromosomes ?
- 17 Give short notes on foetoscopy.
- 18 Write notes on Marfan's syndrome
- 19 What is X-linked recessive inheritance ? Mention one example .
- 20 Explain mitotic non-disjunction.
- 21 Write short notes on adhesion molecules and genes.
- 22 Write short notes on Duchene's muscular dystrophy.

(10 × 2 = 20 marks)

**Part C (Paragraph questions)**

*Answer any five questions.*

*Each questions carries 6 marks.*

- 23 Write notes on the mode of inheritance, types and symptoms of Huntigton's disease.
- 24 Discuss the various banding techniques employed in karyotype analysis.
- 25 Discuss the various steps involved in directive counseling. Mention the merits and demerits.
- 26 Explain any three techniques used for prenatal diagnosis.
- 27 Give an account on the genetic basis of embryonic development.
- 28 What is thalassemia ? Give an account on causes, symptoms, types and diagnosis of thalassemia.

- 29 Explain the symptoms, types and inheritance of Huntington's chorea.
- 30 Give an account on genetic services.

(5 × 6 = 30 marks)

**Part D (Essay questions)**

*Answer any **two** questions.*

*Each question carries 10 marks.*

- 31 What is autosomal recessive inheritance ? Explain the signs, symptoms and genetics of any four autosomal recessive diseases.
- 32 With suitable example explain the steps involved in the construction of human pedigree chart. Add notes on the advantages of pedigree analysis.
- 33 Narrate the history and nomenclature of human chromosomes. Discuss the outputs of various conferences held in connection with the chromosomes.
- 34 Give a detailed account on the structural modifications of human chromosomes, Add a note on the various disorders associated with such modifications.

(2 × 10 = 20 marks)

**SIXTH SEMESTER (CUCBCSS—UG) DEGREE EXAMINATION  
MARCH 2022**

Zoology

ZOL 6B 14—BIOTECHNOLOGY, MICROBIOLOGY AND IMMUNOLOGY

(2014 to 2018 Admissions)

Time : Three Hours

Maximum : 80 Marks

**Part A**

I. One word questions. Answer *all* questions. Each question carries 1 mark :

- 1 Misfolded proteins that have the ability to manifest diseases are called \_\_\_\_\_.
- 2 Give an example of neutral media.
- 3 Name two vitamins produced by intestinal microflora.
- 4 Expand VNTR.
- 5 Name a protozoan observed as commensal in the large intestine of humans.
- 6 Name the enzyme which is called molecular scissors.
- 7 Phagocytosing activity of immune system is performed by \_\_\_\_\_.
- 8 The lymphoid organ getting affected in Grave's disease \_\_\_\_\_.
- 9 'Bt' stands for \_\_\_\_\_ in Bt cotton.
- 10 Name the organism whose genome got sequenced first.

(10 × 1 = 10 marks)

**Part B**

II. Short answer questions. Answer any *ten* questions. Each question carries 2 marks :

- 11 Give an account of Biosensors.
- 12 Write short notes on slime moulds.
- 13 What is pBR322 ?
- 14 Give an account of biofiltration.
- 15 Illustrate the structure of a virus.
- 16 Write short notes on monoclonal antibodies.

**Turn over**

- 17 What are dendritic cells ?
- 18 Give an account of tumor antigens.
- 19 Write short notes on Rickettsia.
- 20 What is Southern Blotting ?
- 21 Write short notes on attenuated vaccines.
- 22 What are plasmids ?

(10 × 2 = 20 marks)

### Part C

III. Paragraph questions. Answer any *five* questions. Each question carries 6 marks :

- 23 Give an account to steroid production by Industrial fermentation.
- 24 Write the principles and applications of ELISA
- 25 Give an account of effects of environment on microbial growth.
- 26 Briefly explain agglutination inhibition reaction.
- 27 Distinguish between VNTR and STR.
- 28 Give an account of organs of immune system.
- 29 Write the causative agents, symptoms and treatment of diseases caused by a virus, bacteria and protozoa.
- 30 Explain Myasthenia gravis.

(5 × 6 = 30 marks)

### Part D

IV. Essay questions. Answer any *two* questions. Each question carries 10 marks :

- 31 Give an account of structure and class of immunoglobulins.
- 32 With suitable illustrations explain the steps involved in recombinant DNA technology. Add a note on various enzymes involved in genetic engineering.
- 33 Briefly explain the basic microbiological techniques that can be used to study a bacterium.
- 34 What is DNA fingerprinting ? Write down it's methodology and practical applications.

(2 × 10 = 20 marks)

**SIXTH SEMESTER (CUCBCSS—UG) DEGREE EXAMINATION  
MARCH 2022**

*Zoology*

**ZOL 6B 13—REPRODUCTIVE BIOLOGY, DEVELOPMENTAL BIOLOGY AND  
TERATOLOGY**

(2014 to 2018 Admissions)

Time : Three Hours

Maximum : 80 Marks

**Part A**

I. One Word Answer Questions. Answer *all* questions. Each question carries 1 mark :

- 1 The first cleavage plane in amphioxus is \_\_\_\_\_.
- 2 In chick embryo, the heart starts beating after \_\_\_\_\_ hours of fertilization.
- 3 \_\_\_\_\_ egg membranes are absent in mammals except prototherians.
- 4 In eutherian mammals, placenta is derived from the \_\_\_\_\_.
- 5 The coiled or 'T' shaped barrier contraceptive inserted in the uterus to prevent implantation is \_\_\_\_\_.
- 6 Fertilization of ovum in mammals takes place in \_\_\_\_\_.
- 7 \_\_\_\_\_ is the ability of a single cell to divide and produce all the differentiated cells in the organism.
- 8 The central region of blastodisc is called \_\_\_\_\_.
- 9 Set of transcription factor genes responsible for determining the general body plan is \_\_\_\_\_.
- 10 The germ layer which forms the skeletal muscle in vertebrate is \_\_\_\_\_.

(10 × 1 = 10 marks)

**Part B**

II. Short Answer Questions. Answer any *ten* questions. Each question carries 2 marks :

- 11 What is exogastrulation ?
- 12 What is corpus luteum ?
- 13 Write notes on cryopreservation of embryos.
- 14 Mention the functions of placenta.

**Turn over**



- 15 Write on primitive streak in chick embryo.
- 16 Mention the development of notochord in frog.
- 17 What is artificial parthenogenesis ?
- 18 Write notes on cell lineage.
- 19 Explain gastrulation in *Amphioxus*.
- 20 Sketch and label the structure of ovum.
- 21 What is vitellogenesis ?
- 22 What do you mean by chorionic villus sampling ?

(10 × 2 = 20 marks)

### Part C

III. Paragraph Questions. Answer any *five* questions. Each question carries 6 marks :

- 23 Give an account on egg membranes
- 24 Discuss the hormonal control of amphibian metamorphosis.
- 25 Give a concise account on different assisted reproductive technologies (ART).
- 26 What is blastulation ? Write a note on types of blastulae.
- 27 Illustrate different morphogenetic movements in the gastrulation in frog.
- 28 Explain gradient experiments in sea urchin eggs.
- 29 Give an account on regeneration in animals.
- 30 What is *in vitro* fertilization ? Add a note on major steps of IVF procedure.

(5 × 6 = 30 marks)

### Part D

IV. Essay Questions. Answer any *two* questions. Each question carries 10 marks :

- 31 With the help of a neat labeled diagram, explain the salient features of 33 hours chick embryo.
- 32 Write an essay on various Teratogenic agents.
- 33 Write an essay on spermatogenesis. Add note on structure of sperm.
- 34 Describe the development of eye in frog with the help of neat, labeled diagrams.

(2 × 10 = 20 marks)

**SIXTH SEMESTER (CUCBCSS—UG) DEGREE EXAMINATION  
MARCH 2022**

Zoology

ZOL 6B 12—MOLECULAR BIOLOGY AND BIOINFORMATICS

(2014 to 2018 Admissions)

Time : Three Hours

Maximum : 80 Marks

**Part A**

1. One word questions. Answer *all* questions. Each question carries 1 mark :

- 1 \_\_\_\_\_ is a data retrieval tool.
- 2 The protein molecule can be unfolded by \_\_\_\_\_.
- 3 Give an example for secondary database.
- 4 Expand URL.
- 5 PCR is conceived by \_\_\_\_\_.
- 6 Units of DNA which can move from one DNA molecule to another are called \_\_\_\_\_.
- 7 The binding site for RNA polymerase is known as \_\_\_\_\_.
- 8 One mRNA encoding more than one protein is known as \_\_\_\_\_.
- 9 Chromatography is a \_\_\_\_\_ technique.
- 10 \_\_\_\_\_ is the inducer in Lac operon.

(10 × 1 = 10 marks)

**Part B**

II. Short answer questions. Answer any *ten* questions. Each question carries 2 marks :

- 11 Define Genome.
- 12 What is Satellite DNA ?
- 13 Write short note on Genetic code.
- 14 What are Molecular chaperons ?

**Turn over**

- 15 What you mean by House keeping genes ?
- 16 What is Cistron ?
- 17 What is EMBL ?
- 18 What is STAG ?
- 19 What is PRINTS ?
- 20 What is CLUSTAL X ?
- 21 Define Proteomics.
- 22 What are Metabolite Databases ?

(10 × 2 = 20 marks)

III. Paragraph questions. Answer any *five* questions. Each question carries 6 marks :

- 23 Explain wobble hypothesis.
- 24 Describe Griffith's experiment.
- 25 Give an account on post translational modifications of protein.
- 26 Explain one gene-one polypeptide hypothesis.
- 27 What is Genomics ? Add a note on its applications.
- 28 Write a note on tools of Metabolomics.
- 29 What are secondary data bases ?
- 30 What are Micro arrays ?

(5 × 6 = 30 marks)

#### Part D

IV. Essay questions. Answer any *two* questions. Each question carries 10 marks :

- 31 Explain regulation of protein synthesis. Give a note on post translational modifications.
- 32 Write an essay on major features of eukaryotic genome.
- 33 Discuss the different types of sequence alignments in Bioinformatics.
- 34 Discuss the applications of Bioinformatics in Microbiology and drug designing.

(2 × 10 = 20 marks)

**SIXTH SEMESTER (CUCBCSS-UG) DEGREE EXAMINATION, MARCH 2022**

## Zoology

## ZOL 6B 11—PHYSIOLOGY AND ENDOCRINOLOGY

(2014 to 2018 Admissions)

Time : Three Hours

Maximum : 80 Marks

**Part A**Answer *all* questions. Each question carries 1 mark :

1. Enzyme converts starch to sugars \_\_\_\_\_.
2. Bond that links amino acids together \_\_\_\_\_.
3. Scurvy is due to the lack of Vitamin \_\_\_\_\_.
4. Tiny air sac in lungs \_\_\_\_\_.
5. Insulin producing cells \_\_\_\_\_.
6. Animals excrete nitrogenous waste as ammonia \_\_\_\_\_.
7. Neuro endocrine organ that produces juvenile hormone in insects \_\_\_\_\_.
8. Process to filter excess fluid and waste out of blood into urine \_\_\_\_\_.
9. Metabolic pathway (Cycle) that converts lactate in the muscle to glucose \_\_\_\_\_.
10. Enzyme involved in the production of light in firefly \_\_\_\_\_.

(10 × 1 = 10 marks)

**Part B**Short answer questions. Answer any *ten* :

11. Define endocrine gland. Write four major endocrine glands in human being.
12. What is Osmoconformers, give two examples.
13. Write a note on oxygen dissociation curve.
14. What is antidiuretic hormone and what is its function ?
15. Differentiate between tachycardia, bradycardia.
16. What is haemoglobinopathy, give one example.
17. Draw and label a nerve cell.
18. What is rigor mortis ?

**Turn over**

19. Write four important endocrine glands in human being and their hormones.
20. What are the difference between granulocytes and agranulocytes ?
21. Define respiratory pigments and their role in respiration.
22. Write the functions of pituitary gland.

(10 × 2 = 20 marks)

### Part C

Paragraph question. Answer any *five* :

23. Explain sliding filament theory of muscle contraction.
24. How does digestion take place in ruminants, explain with diagram ?
25. Describe enzyme cascade theory in blood clotting.
26. Give an account of nutritional disorders.
27. Explain the structure of skeletal muscle in vertebrate.
28. Describe the function of electric organs in fishes.
29. What are the physiological adaptations of diving mammals ?
30. Explain hormone regulated sexual dysfunction in male and female of human being.

(5 × 6 = 30 marks)

### Part D

Essay question. Answer any *two* :

1. Give an account of the major neuro endocrine organs and their functions in insects and crustacea.
2. Describe the gaseous exchange and transport of gases in mammalian respiratory system.
3. Elaborate the type of nerve cells and the mechanism of the transmission of nerve impulse.
4. Draw the ultra structure of skeletal muscle. Explain the physiology and chemistry of muscle contraction.

(2 × 10 = 20 marks)

**SIXTH SEMESTER (CUCBCSS—UG) DEGREE EXAMINATION  
MARCH 2022**

Zoology

ZOL 6B 10—BIOCHEMISTRY

(2014 to 2018 Admissions)

Time : Three Hours

Maximum : 80 Marks

**Part A**

I. One-Word Questions. Answer *all* questions. Each question carries 1 mark :

- 1 Name a disaccharide present in milk.
- 2 Name a protein showing alpha Helix secondary structure.
- 3 Mention the bond which links glucose units of starch.
- 4 Name the cellular fuel.
- 5 Give example for an unsaturated fatty acid.
- 6 Who proposed lock and key hypothesis ?
- 7 Expand FAD.
- 8 Name different molecular forms of same enzyme.
- 9 Name an analytical technique to detect protein in a given sample ?
- 10 Name a pyrimidine base present both in DNA and RNA.

(10 × 1 = 10 marks)

II. Short Answer Questions. Answer any *ten* questions. Each question carries 2 marks :

- 11 What are ribozymes ?
- 12 Write the principle involved in paper chromatography.
- 13 Comment on nucleosides.
- 14 What is transamination ?
- 15 What are Cofactors ?
- 16 Write the clinical significance of Benedict's test.

**Turn over**

- 17 Distinguish between simple and compound lipids with example.
- 18 Define zwitter ion.
- 19 What is B-DNA ?
- 20 Define redox reaction.
- 21 What are acidic amino acids ? Give example.
- 22 Define glycogenolysis.

(10 × 2 = 20 marks)

### Part C

III. Paragraph Questions .Answer any *five* questions. Each question carries 6 marks :

- 23 Write briefly about column chromatography.
- 24 Give an account of Kreb's cycle.
- 25 With the help of a diagram explain the structure of *t*-RNA
- 26 Classify enzymes. Give examples for each class.
- 27 Write a note on cAMP.
- 28 Explain oxidative phosphorylation.
- 29 Explain the biological role of lipids.
- 30 Explain any one separation technique of protein.

(5 × 6 = 30 marks)

### Part D

IV. Essay Questions. Answer any *two* questions. Each question carries 10 marks :

- 31 Explain the structure, properties and classification of amino acids. Illustrate peptide bond.
- 32 Describe the mechanism of enzyme action. Add a note on enzyme inhibition.
- 33 Explain electron transport chain.
- 34 What are lipids ? Classify lipids with examples. Add a note on prostaglandin.

(2 × 10 = 20 marks)

SIXTH SEMESTER (CUCBCSS—UG) DEGREE [SPECIAL] EXAMINATION  
MARCH 2021

## Zoology

## ZOL 6B 15 (E3)—APPLIED ENTOMOLOGY

Time : Three Hours

Maximum : 80 Marks

**Section A (One Word Questions)***Answer all questions.**Each question carries 1 mark.*

1. Insects have \_\_\_\_\_ pairs of legs.
2. Pests which rise to pest status only accidentally or unexpectedly in a few isolated localities are called \_\_\_\_\_ pests.
3. \_\_\_\_\_ is known as Bushman arrow poison.
4. Beetles belong to the order \_\_\_\_\_
5. *Menopon gallinae* is commonly called \_\_\_\_\_ louse of domestic fowl.
6. The alkaloid present in tobacco, known for its insecticidal property is \_\_\_\_\_
7. Foulbrood is a \_\_\_\_\_ disease of the brood of honey bee.
8. *Antheraea assama* produces \_\_\_\_\_ type of silk.
9. Mixed cropping is a \_\_\_\_\_ method of cultural control.
10. *Dacus cucurbitae* is commonly called \_\_\_\_\_ fruit fly.

(10 × 1 = 10 marks)

**Section B (Short Answer Questions)***Answer at least five questions.**Each question carries 4 marks.**All questions can be attended.**Overall Ceiling 20.*

11. Write on forensic entomology.
12. Distinguish between Apterygota and Pterygota.
13. What is nutritional entomology ?

**Turn over**



14. What are Galls ?
15. Write on the role of insects as indicators of pollution.
16. What is maggot therapy ?
17. Comment on resurgence of insect pests.
18. What is Crop Rotation ?
19. Write on the enemies of lac insects.
20. Comment on a pest of goat.
21. Write briefly on two pests of lady's finger.
22. What do you know about coconut mite ?

(5 × 4 = 20 marks)

### Section C (Paragraph Questions)

*Answer at least four questions.*

*Each question carries 7 marks.*

*All questions can be attended.*

*Overall Ceiling 28.*

23. Write on two pests of coffee.
24. Comment on the pests of stored products.
25. Explain the life history, damage caused and control measures of *Spodoptera mauritia*.
26. Write on any *three* biological control projects undertaken in India.
27. Explain the diseases of silk worms.
28. Elaborate on synthetic organic insecticides.
29. Write a brief account on lac cultivation.
30. Explain two pests of pepper.

(4 × 7 = 28 marks)

### Section D (Essay Questions)

*Answer any two questions.*

*Each question carries 11 marks.*

31. Write on the life history, damage caused and control measures of the pests of coconut.
32. Explain the modern methods of pest control. Add a note on IPM.
33. Explain the social organization of honey bee colony.
34. Elaborate on the pests of fruit plants.

(2 × 11 = 22 marks)

**SIXTH SEMESTER (CUCBCSS—UG) DEGREE (SPECIAL) EXAMINATION  
MARCH 2021**

**Zoology**

**ZOL 6B 14—BIOTECHNOLOGY, MICROBIOLOGY AND IMMUNOLOGY**

Time : Three Hours

Maximum : 80 Marks

**Section A (One Word Questions)**

*Answer all questions.*

*Each question carries 1 mark.*

1. Bacterium responsible for causing ulcers in susceptible human hosts is \_\_\_\_\_.
2. Immune cells attacked by HIV, during infection are \_\_\_\_\_.
3. Name any disease caused by prions.
4. The only antibody that can pass through placenta is \_\_\_\_\_.
5. Protein coat of virus is called \_\_\_\_\_.
6. The first successful transfer of embryos, for producing transgenic animal is done by \_\_\_\_\_.
7. Expand RAPD.
8. Name two vitamins produced by intestinal microflora.
9. \_\_\_\_\_ is a lymphoid organ which is seen fully matured in children and then convert to fatty tissue in adults.
10. Name the enzyme called as molecular glue.

(10 × 1 = 10 marks)

**Section B (Short Answer Questions)**

*Answer at least five questions.*

*Each question carries 4 marks.*

*All questions can be attended.*

*Overall Ceiling 20.*

11. What are cosmids ?
12. Write short notes on Prochlorophyta.

**Turn over**

13. What are the significance of NK cells ?
14. Distinguish between exonuclease and endonuclease enzymes.
15. What is Western blotting ?
16. Write short notes on bioleaching.
17. What is hybridoma technology ?
18. What is the significance of Taq polymerase in PCR ?
19. What are endogenous antigens ?
20. Name two diseases in human beings caused by protozoans.
21. Briefly explain agglutination reaction.
22. Give an account of bioremediation.

(5 × 4 = 20 marks)

### Section C (Paragraph Questions)

*Answer at least four questions.*

*Each question carries 7 marks.*

*All questions can be attended.*

*Overall Ceiling 28.*

23. Give an account of DNA profiling.
24. Explain Hashimoto's thyroiditis.
25. Give an account to single cell protein production by Industrial fermentation.
26. Give an account of ethical and social implication of genetic engineering.
27. Write the principles and applications of RIA.
28. Write notes of molecular markers, citing two examples
29. Write the principles and applications of Flow cytometry.
30. Briefly outline the normal microflora of human body.

(4 × 7 = 28 marks)

**Section D (Essay Questions)**

*Answer any **two** questions.*

*Each question carries 11 marks.*

31. What are the major steps involved in rDNA technology ? What is the importance of cloning vectors in rDNA technology ?
32. Give a detailed account on cells and organs of immune system.
33. Briefly explain the basic microbiological techniques that can be used to study a bacterium.
34. What is vaccination ? What is the principle behind vaccination ? Briefly explain different types of vaccines.

(2 × 11 = 22 marks)

CHMK LIBRARY UNIVERSITY OF CALICUT

**SIXTH SEMESTER (CUCBCSS—UG) DEGREE [SPECIAL] EXAMINATION  
MARCH 2021**

**Zoology**

**ZOL 6B 13—REPRODUCTIVE BIOLOGY, DEVELOPMENTAL BIOLOGY AND  
TERATOLOGY**

Time : Three Hours

Maximum : 80 Marks

**Section A (One Word Questions)**

*Answer all questions.*

*Each question carries 1 mark.*

1. Zona pellucida is an example for \_\_\_\_\_ egg membrane.
2. The testicular wall is composed of a fibrous tissue wall called \_\_\_\_\_.
3. Cup shaped mass of white yolk platelets in the endoplasm of frog is termed as \_\_\_\_\_.
4. The ejaculated sperms undergo a period of conditioning called \_\_\_\_\_.
5. Representation of developmental history if each cell in an organism is \_\_\_\_\_.
6. The testicular cells most involved with the construction of the blood testes barrier are \_\_\_\_\_.
7. The chemical found on the surface of ovum which attracts the sperm is \_\_\_\_\_.
8. The floating egg mass of frog is called \_\_\_\_\_.
9. The concept of competence is given by \_\_\_\_\_.
10. The assisted reproductive technique in which sperm is directly injected into the ovum is called \_\_\_\_\_.

(10 × 1 = 10 marks)

**Section B (Short Answer Questions)**

*Answer at least five questions.*

*Each question carries 4 marks.*

*All questions can be attended.*

*Overall Ceiling 20.*

11. What is embryonic induction ?
12. Differentiate cleidoic and non-cleidoic eggs.
13. What are Hox genes ?

**Turn over**

14. What are primary organizers ?
15. Write brief notes on cryopreservation of embryos.
16. Explain capacitation.
17. Mention the importance of grey crescent.
18. What is Sinus terminalis ?
19. Describe vitellogenesis.
20. Differentiate totipotency and pluripotency.
21. What are the applications of embryonic stem cells ?
22. Define double gradient theory

(5 × 4 = 20 marks)

### Section C (Paragraph Questions)

*Answer at least **four** questions.*

*Each question carries 7 marks.*

*All questions can be attempted.*

*Overall Ceiling 28.*

23. What are the major processes involved in gastrulation in amphioxus.
24. Give an account on plane of cleavage with examples.
25. Describe Spemann's constriction experiments on amphibian embryo.
26. Describe the structure of 24 hour chick embryo.
27. Give an account on regeneration in animals.
28. Write a concise account of different methods for parental diagnosis.
29. Write notes on placenta and various types of placenta. Add a note on functions of placenta.
30. Give an account on teratogens.

(4 × 7 = 28 marks)

### Section D (Essay Questions)

*Answer any **two** questions.*

*Each question carries 11 marks.*

31. Write an essay on extra embryonic membranes in chick.
32. Discuss various reproductive technologies used to solve infertility problems.
33. Explain gametogenesis. Add notes on post fertilization events.
34. Write an essay on amphibian metamorphosis.

(2 × 11 = 22 marks)

**SIXTH SEMESTER (CUCBCSS—UG) DEGREE [SPECIAL] EXAMINATION  
MARCH 2021**

**Zoology**

**ZOL 6B 12—MOLECULAR BIOLOGY AND BIOINFORMATICS**

Time : Three Hours

Maximum : 80 Marks

**Section A (One Word Questions)**

*Answer all questions.*

*Each question carries 1 mark.*

1. Genbank is run by \_\_\_\_\_.
2. The histone associated with linker DNA is \_\_\_\_\_.
3. Most abundant RNA in the cell is \_\_\_\_\_.
4. The globular shape of a protein is called \_\_\_\_\_ structure.
5. Write the full form of NCBI.
6. \_\_\_\_\_ enzyme is known as molecular scissors.
7. Opal codon is \_\_\_\_\_.
8. The unit of DNA in which individual acts of replication occur is called \_\_\_\_\_.
9. Name the enzyme that synthesise RNA from RNA template.
10. Name the inducer in Lac operon.

(10 × 1 = 10 marks)

**Section B (Short Answer Questions)**

*Answer at least five questions.*

*Each question carries 4 marks.*

*All questions can be attended.*

*Overall Ceiling 20.*

11. What is meant by Gene expression ?
12. Write short notes on Lac operon.
13. What are Jumping genes ?
14. What are Retroviruses ?
15. What are Ribozymes ?

**Turn over**

16. What is C-value paradox ?
17. What is DDBJ ?
18. What is NCBI ?
19. What is PROSITE ?
20. What is CLUSTAL W ?
21. Write an account on Micro array.
22. What is meant by DNA sequencing ?

(5 × 4 = 20 marks)

### Section C (Paragraph Questions)

*Answer at least **four** questions.*

*Each question carries 7 marks.*

*All questions can be attended.*

*Overall Ceiling 28.*

23. Explain Hershey and Chase experiment.
24. Define genetic code. What are the major features of genetic code ?
25. Explain one gene-one enzyme hypothesis.
26. DNA replication is semi-conservative. Explain.
27. Write notes on BLAST.
28. Write a brief account on tools and applications in proteomics.
29. Describe the role of internet in bioinformatics.
30. Explain with example the use of SRS in Bioinformatic.

(4 × 7 = 28 marks)

### Section D (Essay Questions)

*Answer any **two** questions.*

*Each question carries 11 marks.*

31. With neat sketches explain central dogma of molecular biology.
32. Explain the regulation of gene expression in prokaryotes.
33. What are primary and secondary databases ? Explain in detail.
34. Define genomics. Describe about different classes of genomics. What are the Applications of genomic analysis and studies ?

(2 × 11 = 22 marks)



**SIXTH SEMESTER (CUCBCSS—UG) DEGREE (SPECIAL) EXAMINATION  
MARCH 2021**

Zoology

ZOL 6B 11—PHYSIOLOGY AND ENDOCRINOLOGY

Time : Three Hours

Maximum : 80 Marks

*Give illustrations and figures wherever necessary.*

**Section A**

*Answer all questions.*

*Each question carries 1 mark.*

1. Myelin sheath is produced by \_\_\_\_\_.
2. Brunner's glands are found in \_\_\_\_\_.
3. The contraction of gall bladder is due to the hormone \_\_\_\_\_.
4. In mammals the brain centre regulating body temperature is found in \_\_\_\_\_.
5. Hering- Breuer receptors are present in \_\_\_\_\_.
6. \_\_\_\_\_ is a steroid hormone.
7. Zymogen cells of gastric glands produce \_\_\_\_\_.
8. Accumulation of urea and other waste substances in the blood is called \_\_\_\_\_.
9. In adults, insufficient thyroxine can lead to \_\_\_\_\_.
10. Plasma membrane of muscle fibre is called \_\_\_\_\_.

(10 × 1 = 10 marks)

**Section B (Short Answer Questions)**

*Answer at least **five** questions.*

*Each question carries 4 marks.*

*All questions can be attended.*

*Overall Ceiling 20.*

11. What is Hamberger phenomenon ?
12. What is aphaeresis?

**Turn over**

13. What is rigor mortis ?
14. What do you mean by the vital capacity of lungs ?
15. What is muscle fatigue ?
16. What is tachycardia ?
17. What is node of Ranvier ?
18. What are osmoregulators ?
19. What is TSH ?
20. What are the functions of oxytocin ?
21. What is corpus albicans ?
22. What are X-organs ?

(5 × 4 = 20 marks)

**Section C (Paragraph Questions)**

*Answer at least **four** questions.*

*Each question carries 7 marks.*

*All questions can be attended.*

*Overall Ceiling 28.*

23. Urea cycle.
24. Causes and consequences of obesity.
25. Glial cells.
26. Placental hormones.
27. Osmotic regulation in freshwater fishes.
28. Neuroendocrine organs and hormones in insects.
29. Neural regulation of respiration.
30. Role of hormones in the follicular phase of female sexual cycle.

(4 × 7 = 28 marks)

**Section D (Essay Questions)**

*Answer any **two** questions.*

*Each question carries 11 marks.*

31. Describe the EM structure of skeletal muscle fibre and explain the biochemical changes associated with muscle contraction.
32. Write an essay on the transport of respiratory gases in human body.
33. Explain the mechanism of urine formation. Add a note on its hormonal regulation.
34. Write an essay on the major endocrine glands in man and their hormones.

(2 × 11 = 22 marks)

**SIXTH SEMESTER (CUCBCSS—UG) DEGREE [SPECIAL] EXAMINATION  
MARCH 2021**

Zoology

ZOL 6B 10—BIOCHEMISTRY

Time : Three Hours

Maximum : 80 Marks

**Section A (One Word Questions)**

*Answer all questions.  
Each question carries 1 mark.*

- 1 Name a storage polysaccharide found in animals.
- 2 Name a coenzyme.
- 3 Mention the bond which links amino acids in a protein.
- 4 Name the energy currency of the cell.
- 5 Mention a second messenger.
- 6 Name a nitrogen base present in RNA but absent in DNA.
- 7 Write an example for steroid.
- 8 Who proposed the chemiosmotic theory of ATP synthesis ?
- 9 Expand PAGE.
10. Name the compound lipid found in cell membrane.

(10 × 1 = 10 marks)

**Section B (Short Answer Questions)**

*Answer at least five questions.  
Each question carries 4 marks.  
All questions can be attempted.  
Overall Ceiling 20.*

11. What are ribozymes ?
12. Write the principle involved in Biuret test.
13. Draw the structure of glucose.
14. What is deamination ?

**Turn over**

15. What are isozymes ? Give example.
16. Write the principle of spectrophotometer.
17. Distinguish between unsaturated and saturated fatty acids with example.
18. Define isoelectric point of aminoacid.
19. Write a note on tRNA.
20. Define oxidative phosphorylation.
21. What are zwitter ions ?
22. Define gluconeogenesis.

(5 × 4 = 20 marks)

### Section C (Paragraph Questions)

*Answer at least four questions.  
Each question carries 7 marks.  
All questions can be attended.  
Overall Ceiling 28.*

23. Write an account on paper chromatography.
24. Give an account of glycogenesis.
25. With the help of a diagram explain the structure of B-DNA.
26. Explain Beta oxidation.
27. What are prostaglandins ? Write their functions.
28. Explain competitive inhibition with examples.
29. Describe electron transport chain.
30. Explain chemiosmotic theory.

(4 × 7 = 28 marks)

### Section D (Essay Questions)

*Answer any two questions.  
Each question carries 11 marks.*

31. What are carbohydrates ? Classify carbohydrates. Write any four biological functions of carbohydrates.
32. Explain the properties of enzymes. Comment on the mechanism of enzyme action.
33. Write an account on glycolysis.
34. What is primary, secondary, tertiary and quaternary structure of proteins ? Explain each one giving examples.

(2 × 11 = 22 marks)