

**FOURTH SEMESTER (CBCSS—UG) DEGREE EXAMINATION  
APRIL 2022**

**Zoology**

**ZOL 4C 04T—GENETICS AND IMMUNOLOGY**

(2019 Admission onwards)

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 polygenic inheritance? Give an example.
2. What are gynandromorphs ?
3. What are transposons ?
4. What is amniocentesis ?
5. Give a brief note on barr body.
6. Differentiate between carcinoma and sarcoma.
7. Distinguish between transcription and reverse transcription.
8. What are monoclonal antibodies ? Give its applications.
9. What is X-linked inheritance ? Give an example.
10. What is ELISA ?
11. What are attenuated vaccines ? Give an example.
12. What is Y-linked inheritance ? Give an example.

(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. Briefly describe the genetic basis and symptoms of sickle cell anemia.
14. Write the major characteristics of genetic code.
15. What are cloning vectors ? Briefly mention any four types of cloning vectors.
16. Write a brief note on the principle, procedure and applications of DNA finger printing.
17. Give a brief description on immuno-deficiency diseases ?
18. Briefly describe the role of enzymes in recombinant DNA technology.
19. Write a note on phenylketoneuria.

(5 × 5 = 25 marks)

**Section C**

*Answer any **one** question.*

*The question carries 11 marks.*

20. Describe the Pataus and Denver system of classification of human chromosomes.
21. Write an essay on autoimmune diseases.

(1 × 11 = 11 marks)

FOURTH SEMESTER (CBCSS—UG) DEGREE EXAMINATION  
APRIL 2022

Zoology

ZOL 4B 04T—ANIMAL DIVERSITY : CHORDATA—Part II

(2019 Admission onwards)

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. Write the structure of the cloaca of *Columba livia*.
2. Mention the functions of the air sacs in *Columba livia*.
3. Mention the adaptations of *Struthio*.
4. What are the salient features of the order Anseriformes.
5. Write briefly on any *two* extinct birds you have studied.
6. Stating the dental formula, explain the dentition in *Oryctolagus cuniculus*.
7. Write a brief note on scaly ant eater.
8. Mention the salient features of the order Artiodactyla.
9. Mention the accessory reproductive glands and their functions in *Oryctolagus cuniculus*.
10. Compare the olfactory lobes of the brain of Amphibia and Reptilia.
11. Distinguish between pronephric and metanephric kidneys.
12. Distinguish between digitigrade and unguligrade progression.

(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. With a labeled diagram explain the structure of a typical feather of *Columba livia*.
14. Explain the evolutionary significance of *Archaeopteryx lithographica*.
15. Mention the salient features of the order Galliformes. Write a note on an example you have studied.
16. With a labeled diagram, explain the thoracic skeletal framework of *Oryctolagus cuniculus*.
17. Mention the salient features of the order Cetacea.
18. What are the salient features of the subclass Prototheria. Write a note on duck-billed platypus.
19. Compare the heart of Amphibia and Reptilia.

(5 × 5 = 25 marks)

**Section C**

*Answer any one question.*

*The question carries 11 marks.*

20. With illustrations explain the vertebral column of *Columba livia*.
21. With a labeled diagram explain the digestive system of *Oryctolagus cuniculus*.

(1 × 11 = 11 marks)

**FOURTH SEMESTER (CUCBCSS—UG) DEGREE EXAMINATION  
APRIL 2022**

Zoology

ZOL 4C 04—GENETICS AND IMMUNOLOGY

(2014—2018 Admissions)

Time : Three Hours

Maximum : 64 Marks

**Part A**

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

- 1 Transfer of RNA from gel to nitrocellulose paper is termed as \_\_\_\_\_.
- 2 Each cell in an individual with Turner's syndrome contains \_\_\_\_\_ number of chromosomes.
- 3 Hershey and Chase experiments helped to confirm that \_\_\_\_\_ is the genetic material of phages.
- 4 Write the full form of 'MHC' locus.
- 5 Cancerous tumor of connective tissue is known as \_\_\_\_\_.
- 6 Coding part of split genes are called \_\_\_\_\_.
- 7 Genes similar to normal genes but non-functional is \_\_\_\_\_.
- 8 The chromosome which is involved in sex linked inheritance \_\_\_\_\_.
- 9 Who discovered Barr body ?
- 10 Antibodies that impart neonatal immunity are \_\_\_\_\_.

(10 × 1 = 10 marks)

**Part B**

II. Short Answer Questions. Answer any *seven* of the following. Each question carries 2 marks :

- 11 Immunoprecipitation.
- 12 Vaccine.
- 13 Metastasis.

**Turn over**

- 14 Eugenics.
- 15 Karyotype.
- 16 Restriction endonucleases.
- 17 Gynandromorph.
- 18 Acquired immunity.
- 19 Amniocentesis.
- 20 Carcinoma.

(7 × 2 = 14 marks)

### Part C

III. Paragraph Questions. Answer any *four* questions. Each question carries 5 marks :

- 21 Write the methodology and applications of southern blotting.
- 22 Give an account on the potential hazards of genetic engineering.
- 23 Explain Hershey and Chase experiment.
- 24 Give an account on organs and cells of immune system.
- 25 Differentiate between benign and malignant tumor. Explain the various theories on the origin of cancer.
- 26 Give an outline of translation process.

(4 × 5 = 20 marks)

### Part D (Essay Questions)

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

- 27 Describe the structure of a typical chromosome. Explain the karyotype, classification and grouping of human chromosomes based on Patua's and Denver scheme.
- 28 With suitable diagram explain the basic steps involved in recombinant DNA technology. Add a note on the role of enzymes involved in genetic engineering.
- 29 Explain the different types of immune responses. Add a note on the structure of a typical immunoglobulin.
- 30 Explain the various mechanisms involved in sex determination.

(2 × 10 = 20 marks)

## FOURTH SEMESTER (CUCBCSS—UG) DEGREE EXAMINATION, APRIL 2022

## Zoology

## ZOL4B04—ANIMAL DIVERSITY : CHORDATA—II

(2014—2018 Admissions)

Time : Three Hours

Maximum : 80 Marks

*Give diagrams wherever required.***Part A**I. One Word Questions Answer *all* Questions :

- 1 In birds, the neck vertebrae are typically \_\_\_\_\_.
- 2 Jaw suspension in pigeon is \_\_\_\_\_.
- 3 Mention an extinct bird.
- 4 Ostrich belongs to the order \_\_\_\_\_.
- 5 Mention the genus name of the common cuckoo.
- 6 Egg-laying mammals belong to the order \_\_\_\_\_.
- 7 African elephants belong to the genus \_\_\_\_\_.
- 8 A mammal which walks on the sole of the feet is said to have \_\_\_\_\_ progression.
- 9 Vertebra in which the centrum is flat at both the ends is called \_\_\_\_\_.
- 10 The salivary gland at the base of the ear lobes in rabbit is \_\_\_\_\_ gland.

(10 × 1 = 10 marks)

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

- 11 What is pecten ?
- 12 Write briefly on syrinx in pigeon.
- 13 What is cloaca ?
- 14 Mention the important reptilian features of *Archaeopteryx*.

**Turn over**

- 15 Comment on passenger pigeon.
- 16 What are the adaptive features of penguins ?
- 17 Write briefly on the cutaneous glands of rabbit.
- 18 What is craniostylic jaw suspension ?
- 19 Write briefly on the spiny ant-eater.
- 20 Mention the salient features of the order Artiodactyla.
- 21 Comment on the dentition in elephant.
- 22 Mention the salient features of the order Chiroptera.

(10 × 2 = 20 marks)

### Part C

III. Paragraph Questions. Answer any *five* :

- 23 Describe the structure of a typical quill feather of pigeon.
- 24 Explain the flight muscles of pigeon.
- 25 Citing an example, mention the salient features of the order Dinornithiformes.
- 26 Elucidate the structure of the pectoral girdle and sternum of rabbit.
- 27 Describe the dentition of rabbit.
- 28 Explain the male urinogenital system of rabbit.
- 29 Write the structure of the pelvic girdle of rabbit.
- 30 What are the adaptations for aquatic life in cetaceans ?

(5 × 6 = 30 marks)

### Part D

IV. Essay Questions. Answer any *two* :

- 31 Explain the respiratory system and the mechanism of respiration in pigeon.
- 32 Describe the structure of the eye of rabbit.
- 33 Elucidate the digestive system of rabbit.
- 34 Explain the structure of the brain of rabbit.

(2 × 10 = 20 marks)



**FOURTH SEMESTER (CBCSS—UG) DEGREE EXAMINATION  
APRIL 2021**

Zoology

ZOL 4C 04T—GENETICS AND IMMUNOLOGY

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 euphenics ?
2. What are sex mosaics ?
3. What are pseudogenes ?
4. What is reverse transcription ?
5. Write a brief note on ELISA.
6. What is karyotyping ?
7. What are haptens ?
8. What is RIA ? Write its applications.
9. What are split genes ?
10. Mention any *two* enzymes and their role in recombinant DNA technology.
11. What are vaccines ? Give an example.
12. What is polygenic inheritance ? Give an example.

(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. Give a brief description of cloning vectors.
14. What is genetic code? Write its characteristics.
15. Describe the genetic cause and symptoms of sickle cell anaemia.
16. Briefly describe the major autoimmune diseases.
17. Give a brief note on different types of cancer.
18. Write a note on chromosomal basis of sex determination.
19. Give an account on immune-deficiency diseases.

(5 × 5 = 25 marks)

**Section C**

*Answer any **two** question.*

*Each question carries 11 marks.*

20. Describe the structure and diversity of antibodies.
21. Write an essay on sex-linked inheritance.

(1 × 11 = 11 marks)

**FOURTH SEMESTER (CBCSS—UG) DEGREE EXAMINATION, APRIL 2021****Zoology****ZOL 4B 04T—ANIMAL DIVERSITY : CHORDATA—Part II**

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 is a heterocoelus vertebra ?
2. What are filoplumes ?
3. Mention the salient features of the order Piciformes.
4. What do you know about Jerdon's Courser ?
5. Write the important features of *Eudynamis*.
6. Explain the method of digestion of cellulose in *Oryctolagus cuniculus*.
7. Mention the eye glands and their functions in *Oryctolagus cuniculus*.
8. What are baleen whales ?
9. Stating the dental formula, explain the dentition in elephant.
10. Mention the salient features of the order Carnivora.
11. Compare the ventricles of the heart of Reptilia and Aves.
12. Compare the cerebellum of the brains of Aves and Mammalia.

(8 × 3 = 24 marks)

**Section B (Paragraph Questions)***Answer at least **five** questions.**Each question carries 5 marks.**All questions can be attended.**Overall Ceiling 25.*

13. With a labeled diagram explain the structure of the pectoral girdle and sternum in *Columba livia*.
14. Mention the salient features of the order Sphenisciformes. Cite an example giving features and adaptations.

**Turn over**

15. Write an account on the recently extinct birds you have studied.
16. Explain the various cutaneous glands and their functions in *Oryctolagus cuniculus*.
17. Write the salient features of the order Artiodactyla. Mention two examples.
18. Mention the salient features of the infraclass Metatheria.
19. Compare the excretory systems of vertebrates.

(5 × 5 = 25 marks)

**Section C (Essay Questions)**

Answer any **one** question.

The question carries 11 marks.

20. With a labeled diagram explain the structure of the eye of *Columba livia*.
21. With illustrations explain the structure of the vertebral column of *Oryctolagus cuniculus*.

(1 × 11 = 11 marks)

**FOURTH SEMESTER (CUCBCSS—UG) DEGREE EXAMINATION  
APRIL 2021**

**Zoology**

**ZOL 4C 04—GENETICS AND IMMUNOLOGY**

(2014 Admissions)

Time : Three Hours

Maximum : 64 Marks

**Part A**

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

- 1 The science of improving the internal well-being of human by improving the external factor of their environment is \_\_\_\_\_.
- 2 Who discovered DNA finger printing ?
- 3 Two DNA fragments are joined by the enzyme \_\_\_\_\_.
- 4 Which RNA reads the codon of mRNA ?
- 5 Protein synthesis takes place in \_\_\_\_\_ organelle.
- 6 An enzyme which cuts DNA at specific sites is known as \_\_\_\_\_.
- 7 The modern technique is used for solving paternal dispute is \_\_\_\_\_.
- 8 Immunoglobulin that mediates allergic reaction is \_\_\_\_\_.
- 9 Southern blotting is used to detect specific segments \_\_\_\_\_.
- 10 Genic balance theory of sex determination is proposed by \_\_\_\_\_.

(10 × 1 = 10 marks)

**Part B**

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

- 11 Cytokines.
- 12 Monoclonal antibodies.
- 13 Sickle cell anemia.
- 14 One gene-one polypeptide synthesis.

Turn over

- 15 Major histocompatibility complex.
- 16 Innate immunity.
- 17 Multiple sclerosis.
- 18 VNTR.
- 19 Oncogenes.
- 20 Y-linked inheritance.

(7 × 2 = 14 marks)

### Part C

III. Paragraph Questions. Answer any *four* questions. Each carries 5 marks :

- 21 Give an account on the genetics of infertility reproduction.
- 22 Give an account on human karyotype.
- 23 With suitable example explain the mechanism of X-linked inheritance.
- 24 Give an account on the characteristics of cancer cells.
- 25 Explain secondary immune deficiency disease with suitable example.
- 26 Explain the methodology and applications of southern blotting.

(4 × 5 = 20 marks)

### Part D

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

- 27 Explain the different types of immune responses. Add a note on the structure of a typical immunoglobulin.
- 28 Write an essay on the mechanism of sex determination.
- 29 Give a detailed account on various vectors used in genetic engineering. Add a note on the mechanism of introduction of recombinant DNA into the host organism and their screening.
- 30 Define genetic material. Explain the experiments which prove DNA as genetic material.

(2 × 10 = 20 marks)

**FOURTH SEMESTER (CUCBCSS—UG) DEGREE EXAMINATION, APRIL 2021****Zoology****ZOL 4B 04—ANIMAL DIVERSITY : CHORDATA—II**

(2014 Admissions)

Time : Three Hours

Maximum : 80 Marks

*(Give diagrams wherever required).***Part A****I. One Word Questions. Answer *all* questions :**

- 1 In birds, the sound producing organ is called \_\_\_\_\_.
- 2 In the eye of pigeon, projecting into the vitreous chamber from the blind spot is a comb like structure called \_\_\_\_\_.
- 3 Kingfishers belong to the order \_\_\_\_\_.
- 4 \_\_\_\_\_ is the smallest living flightless bird.
- 5 \_\_\_\_\_ is considered as the connecting link between reptiles and birds.
- 6 Pinna is absent in \_\_\_\_\_ mammals.
- 7 Rhinoceros belongs to the order \_\_\_\_\_.
- 8 A mammal which walks on toes and not touching ground with its heels is said to have \_\_\_\_\_ progression.
- 9 In rabbit, the testes are enclosed within a cutaneous pouch called \_\_\_\_\_.
- 10 The collar bone in rabbit is called \_\_\_\_\_.

(10 × 1 = 10 marks)

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

- 11 What is a heterocoelus centrum ?
- 12 What is uricotelism ?
- 13 What is autostylic jaw suspension ?

Turn over

- 14 Mention the salient features of the subclass Archaeornithes.
- 15 Write briefly on Indian koel
- 16 Comment on the adaptive features of ostrich.
- 17 Write a note on the eye glands of rabbit.
- 18 What is double circulation ?
- 19 What do you know about scaly ant-eater ?
- 20 Mention the salient features of the order Perissodactyla.
- 21 What is duck-billed platypus ?
- 22 Mention the most important features of the order Cetacea.

(10 × 2 = 20 marks)

### Part C

III. Paragraph Questions. Answer any *five* questions :

- 23 Explain the flight muscles of pigeon.
- 24 Describe the structure of the female genital organs of pigeon.
- 25 Citing an example, mention the salient features of the order Strigiformes.
- 26 Elucidate the structure of the pectoral girdle and sternum of pigeon.
- 27 Explain the female urinogenital system in rabbit.
- 28 Describe the structure of the pelvic girdle of rabbit.
- 29 Write on the dentition of rabbit.
- 30 Mention the salient features of Metatheria.

(5 × 6 = 30 marks)

### Part D

IV. Essay Questions. Answer any *two* questions :

- 31 Explain the structure and functions of different kinds of feathers in pigeon.
- 32 Describe the internal structure of the heart of pigeon.
- 33 Elucidate the respiratory system and the mechanism of respiration in rabbit.
- 34 Write the structure of the integument of rabbit.

(2 × 10 = 20 marks)