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Reg. No. : .....

Code No. : 20395 E Sub. Code : AEZO 61

B.Sc. (CBCS) DEGREE EXAMINATION, APRIL 2023

Sixth Semester

Zoology

Major Elective — SERICULTURE

(For those who joined in July 2020 onwards)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. The ideal temperature for growing mulberry is  
(a) 22 - 25°C (b) 23 - 26°C  
(c) 24 - 29°C (d) 25 - 30°C
2. Which biofertilizer used in mulberry?  
(a) Azospirillum (b) Rhizobium  
(c) Azolla (d) Mycorrhiza

3. The causal organism for root knot disease is  
(a) *Meloidogyne incognita*  
(b) *Lasiodiplodia theobromae*  
(c) *Peridiospora mori fungus*  
(d) *Cercospora moricola*
4. \_\_\_\_\_ deficiency leads to reduced growth in mulberry.  
(a) Nitrogen (b) Phosphorous  
(c) Potassium (d) Magnesium
5. Which is the young age silkworm?  
(a) Pupa  
(b) Adult  
(c) Spinning worms  
(d) Chawki
6. Sericteries (silk glands) are modified form of  
(a) Intestinal glands  
(b) Gastric glands  
(c) Endocrine glands  
(d) Salivary glands

7. Foam rubber strips is used to maintain high humidity in bed of
- (a) Adult worms (b) Young worms  
(c) Pupae (d) Cocoon
8. The young age silkworm rearing houses are often called as
- (a) Chawki rearing centre  
(b) Shelf rearing centre  
(c) Floor rearing centre  
(d) Shoot rearing centre
9. \_\_\_\_\_ is the bacterial disease of silk worm.
- (a) Septicemia (b) Pebrin  
(c) Muscardine (d) Gattine
10. Reeling of silk is
- (a) a process of making silk reels  
(b) the spinning of silk fibres  
(c) the weaving of silk cloth  
(d) the process of taking silk threads from the cocoon

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).  
Each answer should not exceed 250 words.

11. (a) List out the role of central silk board.
- Or
- (b) Write short note on high yielding varieties of mulberry plants.
12. (a) What are the pests that affects the mulberry leaves?
- Or
- (b) Comment on nematode disease of mulberry.
13. (a) Give a detailed note on voltinism.
- Or
- (b) Write a note on endocrine glands of silkworm.
14. (a) Give an account on Chawki rearing.
- Or
- (b) List out the steps involved in rearing operation.

15. (a) Write a note on fungal disease of silkworm.

Or

(b) Comment on cocoon boiling and deflossing.

PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 600 words.

16. (a) Write an essay on manuring mulberry plant.

Or

(b) Enumerate on methods of propagation.

17. (a) Comment on fungal and bacterial diseases of mulberry.

Or

(b) Give an account on deficiency diseases.

18. (a) Write a note on :

(i) Digestive system of silkworm

(ii) Circulatory system of silkworm.

Or

(b) Write an essay on life cycle of mulberry silkworm with suitable diagram.

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19. (a) Give an account on rearing operation.

Or

(b) What is mounting? Explain the methods and precautions of mounting.

20. (a) Write an essay on viral and bacterial diseases of silkworm.

Or

(b) Give an account on different methods and process of reeling.

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Code No.: 20400 E Sub. Code: AEZO 66

B.Sc. (CBCS) DEGREE EXAMINATION, APRIL 2023

Sixth Semester

Zoology — Major Elective

POULTRY SCIENCE

(For those who joined in July 2017 onwards)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions

Choose the correct answer :

1. Poultry is one of the fastest-growing segments of the \_\_\_\_\_ sector in India today.
  - (a) Sericulture
  - (b) agricultural
  - (c) apiculture
  - (d) all of the above

2. Deep litter is an animal housing system, based on the repeated spreading of straw material in.
  - (a) indoor booths
  - (b) outdoor booths
  - (c) house booths
  - (d) all the above
3. Baby chicks need 24 hours of light for the first \_\_\_\_\_ hours of life to ensure that they find food and water.
  - (a) 48 to 72
  - (b) 48 to 84
  - (c) 48 to 102
  - (d) all the above
4. Beak trimming is performed in poultry production to reduce
  - (a) cannibalism
  - (b) aggressive
  - (c) feather pecking
  - (d) all the above
5. Poultry require higher levels of macrominerals and lower levels of \_\_\_\_\_ in their diets.
  - (a) milk protein
  - (b) milk fat
  - (c) milk vitamin
  - (d) microminerals



6. The general opinion of poultry producers and feed manufacturers is that the fibre content of the rations should be kept
- (a) below 7%                      (b) below 8%  
(c) below 9%                      (d) none of the above
7. Feed additives are products used in animal nutrition for the purposes of improving
- (a) water content  
(b) fat content  
(c) protein content  
(d) quality of feed
8. There are main groups of nutritional supplements that can be added to poultry feed
- (a) proteins and amino acids  
(b) vitamins and minerals  
(c) vitamins  
(d) all the above
9. Fowl Cholera is a chronic disease caused by
- (a) Pasteurella multocida  
(b) E.coli  
(c) Salmonella  
(d) all the above

10. Fowl pox is transmitted to flocks primarily through biting
- (a) mosquitoes                      (b) worms  
(c) ants                                  (d) all the above

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).  
Each answer should not exceed 250 words.

11. (a) What are commercial laying hens?
- Or
- (b) Write about a dropping board in poultry?
12. (a) Is chicken manure high in nutrients? What is the NPK content of poultry manure?
- Or
- (b) What are the different management practices of poultry?
13. (a) Describe the food requirements of layer chicken.
- Or
- (b) Explain how do you control fat in chicken.

14. (a) List out the supplemental feed for poultry?

Or

(b) What are the protein supplement for poultry feed?

15. (a) Enumerate the symptoms and treatment of aflatoxicosis.

Or

(b) What are the common nematodes of poultry?

PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b)  
Each answer should not exceed 600 words.

16. (a) Explain the cage system in poultry? What are the advantages of cage system in poultry?

Or

(b) Describe the basic principles of poultry house construction.

17. (a) Write an essay on nutritional content of egg.

Or

(b) How do you manage summer stress in poultry? Which season is best for poultry farming?

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18. (a) Explain the effects of nutritional deficiencies in Poultry?

Or

(b) Why vitamins and minerals are necessary for the growth and development of chicken?

19. (a) How do you make poultry feed formula? What are the ingredients of poultry feed?

Or

(b) Explain the importance of feed additives in poultry diets.

20. (a) What are the major and common diseases of poultry in India?

Or

(b) What are the bacterial diseases and its preventive measures in poultry farming?

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B.Sc. (CBCS) DEGREE EXAMINATION, APRIL 2023

Fourth Semester

Zoology — Core

CELL AND MOLECULAR BIOLOGY

(For those who joined in July 2020 only)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. The study of the structure and composition of cells is called \_\_\_\_\_
  - (a) cytology
  - (b) anthology
  - (c) ecology
  - (d) phenology
  
2. Which of the following cell organelles is called digestive bags?
  - (a) nucleus
  - (b) lysosomes
  - (c) chloroplast
  - (d) mitochondria

3. Which of the following is considered as a cell with in a cell?  
 (a) Chloroplast (b) Ribosome  
 (c) Mitochondria (d) Golgi complex
4. Which organelle is the site of protein synthesis?  
 (a) Ribosomes (b) Lysosomes  
 (c) Mitochondria (d) Golgi complex
5. Nuclei were first discovered by \_\_\_\_\_  
 (a) Strasburger (b) Fonatana  
 (c) Robert brown (d) Robert Koch
6. \_\_\_\_\_ is a form of cell division which results in the creation of gameter or sex cells.  
 (a) Plitosis (b) Meiosis  
 (c) Both (a) and (b) (d) None
7. During all division, the spindle fibres attach to the chromosomes at a region called \_\_\_\_\_  
 (a) Chromocentre (b) Kinetochore  
 (c) Centriole (d) Chromomere
8. When does synapsis occur during meiosis?  
 (a) Zygotene (b) Leptotene  
 (c) Diplotene (d) Pachytene
9. Conversion of messages carried by mRNA into aminoacid sequences is called  
 (a) Replication (b) DNA repair  
 (c) Translation (d) Transcription

10. What is the size of prokaryotic ribosome?  
 (a) 80S (b) 70S  
 (c) 40S (d) 60S

PART B — (5 × 5 = 25 marks)

Answer ALL questions choosing either (a) or (b).  
 Each answer should not exceed 250 words.

11. (a) Describe gram staining.  
 Or  
 (b) Write the instrumentation of electron microscope.
12. (a) Summarize the functions of lysosomes.  
 Or  
 (b) Comment on centrioles.
13. (a) Describe the structure of chromosomes.  
 Or  
 (b) Write notes on nuclear membrane.
14. (a) Comment on DNA hybridization.  
 Or  
 (b) Explain the initiation of DNA replication.
15. (a) Summarize the properties of genetic code.  
 Or  
 (b) Describe synaptonemal complex.

PART C — (5 × 8 = 40 marks)

Answer ALL questions choosing either (a) or (b).

Each answer should not exceed 600 words.

16. (a) Explain the principle and applications of phase contrast microscope.

Or

- (b) Explain compound microscope in detail.

17. (a) Describe the ultra structure of golgi apparatus.

Or

- (b) Write an essay on ribosomes.

18. (a) Explain polytene chromosome.

Or

- (b) Summarize the properties and treatment of cancer cells.

19. (a) Describe the double helical structure of DNA.

Or

- (b) Explain transcription in detail.

20. (a) Write a detailed note on meiosis.

Or

- (b) Explain tryptophan operon.

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B.Sc. (CBCS) DEGREE EXAMINATION, APRIL, 2023

Fifth Semester

Zoology — Core

ECOLOGY AND TOXICOLOGY

(For those who joined in July 2020 onwards)

Time : Three hours Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. The organisms synthesize the food from the abiotic factors  
(a) Decomposers (b) Consumers  
(c) Parasites (d) Producers
2. The basic functional unit of an environment is  
(a) ecosystem (b) biotic factor  
(c) abiotic factor (d) tropic level

3. Each steps of the food chain is called  
(a) Food web (b) Producers  
(c) Consumers (d) Trophic level
4. In animal relationship one partner is harmed in  
(a) Antibiosis (b) Predation  
(c) Parasitism (d) Competition
5. The average number of new individuals produced by a population in a given time  
(a) Growth (b) Natality  
(c) Mortality (d) Dispersal
6. The intermediate zone lying between adjacent community is  
(a) niche (b) stratification  
(c) ecotone (d) succession
7. Kaziranga national park is famous for  
(a) Elephant (b) Snakes  
(c) Lion (d) Rhinoceros

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8. The following animal is killed for drugs  
(a) Goat (b) Deer  
(c) Varanus (d) Turtle
9. The example of synthetic poison is  
(a) Snake venom (b) Fish venom  
(c) Pesticides (d) Botulinum
10. The toxin produced by fungi is  
(a) Mycotoxin (b) Cicutoxin  
(c) Ergotoxin (d) Zootoxin

PART B — (5 × 5 = 25 marks)

Answer ALL questions choosing either (a) or (b).  
Each answer should not exceed 250 words.

11. (a) List down the adaptations developed in animal escape from the extreme temperature.  

Or

(b) Explain the role of producers and consumers in the ecosystem.

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12. (a) Describe the ecological pyramid.  

Or

(b) Describe commensalism with example.
13. (a) Write short note on population density.  

Or

(b) Briefly explain the ecological succession.
14. (a) Explain the measures taken from the conservation of wildlife.  

Or

(b) Discuss the application of remote sensing in agriculture.
15. (a) List the harmful effect of toxicant on public health.  

Or

(b) List out the harmful effects of pesticides.

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[P.T.O.]



PART C — (5 × 8 = 40 marks)

Answer ALL questions choosing either (a) or (b).  
Each answer should not exceed 600 words.

16. (a) Write an essay on biological effects of light on organisms.

Or

- (b) Write an essay on pond ecosystem.

17. (a) What is ecological pyramid and explain the importance and types of an ecological pyramid.

Or

- (b) Briefly explain the classifications of the animal relationships.

18. (a) Give brief account on the characters of population ecology.

Or

- (b) Explain various adaptations seen in desert animals for the conservation of water.

19. (a) Explain the necessity and methods of wildlife conservation.

Or

- (b) Give an account of urbanization.

20. (a) Write an essay on toxicity of heavy metals and its effect.

Or

- (b) Give an account on the types of environmental toxicology.
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B.Sc. (CBCS) DEGREE EXAMINATION, APRIL 2023

Fifth Semester

Zoology — Core

GENETICS

(For those who joined in July 2020 onwards)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

- Which term represents a pair of contrasting characters?
  - Heterozygous
  - Homozygous
  - Codominant gene
  - Allelomorphs

- How many phenotype occur in the human blood group ABO with alleles IAIBi?
  - 1
  - 2
  - 4
  - 3
- Complete linkage has been reported in \_\_\_\_\_
  - Maize
  - Human female
  - Male drosophila
  - Female drosophila
- Crossing over occurs during \_\_\_\_\_
  - Pachytene
  - Diplotene
  - Diakinesis
  - Both (a) and (b)
- Which of the following is not the characteristics of the person suffering from turner's syndrome?
  - short stature
  - poor breast development
  - well developed ovaries
  - non menstruation
- Missing of one chromosome is known as \_\_\_\_\_
  - monosomy
  - nullisomy
  - trisomy
  - tetrasomy

- Albinism is a congenital disorder resulting from the lack of which enzyme?
  - Tyrosinase
  - Xanthine oxidase
  - Catalase
  - Fructokinase
- The most striking example of point mutation is found in a disease called \_\_\_\_\_
  - Down's syndrome
  - Sickle cell anaemia
  - Thalassaemia
  - Night blindness
- The transfer of naked DNA from one cell to another is referred to as \_\_\_\_\_
  - Transduction
  - Lysogeny
  - Transformation
  - Conjugation
- Transfer of genetic material in bacteria through virus is termed as \_\_\_\_\_
  - transduction
  - recombination
  - conjugation
  - transformation

PART B — (5 × 5 = 25 marks)

Answer ALL questions choosing either (a) or (b).

Each answer should not exceed 250 words.

- Write notes on lethal genes.

Or

  - Describe codominance.
- Explain colourblindness in man.

Or

  - Give an account on sex linked genes.
- Describe Down's syndrome.

Or

  - Write short note on albinism.
- Give a brief account on mutagens.

Or

  - List out simple Mendalian traits in man.
- Explain transduction in brief.

Or

  - Write down the genetic applications of virus.



PART C — (5 × 8 = 40 marks)

Answer ALL questions choosing either (a) or (b).  
Each answer should not exceed 600 words.

16. (a) Explain dihybrid cross.

Or

(b) Explain skin colour in man.

17. (a) What is crossing over? Explain mechanism of crossing over.

Or

(b) Describe Haemophilia a sex linked inheritance in man.

18. (a) Write an essay on mutation.

Or

(b) Explain the following:

(i) Klinefelter's syndrome

(ii) Turner's syndrome.

19. (a) Give an account on genetic counselling.

Or

(b) Explain pedigree analysis.

20. (a) Explain the life history of bacteriophage.

Or

(b) Write an essay on bacterial transformation.

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B.Sc. (CBCS) DEGREE EXAMINATION, APRIL 2023

Fifth Semester

Zoology — Core

ANIMAL PHYSIOLOGY AND BIOCHEMISTRY

(For those who joined in July 2020 onwards)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. Sucrose is the example of
  - (a) Monosaccharides
  - (b) Disaccharides
  - (c) Trisaccharides
  - (d) Polysaccharides
  
7. The region between two Z line is called
  - (a) Thin filament
  - (b) Thick filament
  - (c) Sarcomere
  - (d) H zone
8. The ion that is essential for conduction of nerve impulse
  - (a)  $Ca^{++}$
  - (b)  $Mg^{++}$
  - (c)  $K^+$
  - (d)  $Fe^{++}$
9. Which one of the following hormone is secreted by Neurohypophysis?
  - (a) Growth Hormone
  - (b) Thyroid Stimulating Hormone
  - (c) Vasopressin
  - (d) Lutheinizng Hormone
10. The Hormone secreted by male reproductive organ
  - (a) Progesterone
  - (b) Oestrogen
  - (c) Testosterone
  - (d) Oxytocin

2. Conjugated protein is a
  - (a) Holoprotein
  - (b) Prosthetic group
  - (c) Apoprotein
  - (d) Prolamine
3. The removal of amino group from the amino acid is called
  - (a) Transamination
  - (b) Deamination
  - (c) Decarboxylation
  - (d) Methylation
4. The process by which insoluble lipids are converted into a milky liquid is called
  - (a) Coagulation
  - (b) Absorption
  - (c) Emulsification
  - (d) Digestion
5. The relaxation process of auricle and ventricle is called
  - (a) diastole
  - (b) systole
  - (c) cardiac cycle
  - (d) cardiac rhythm
6. The functional unit of kidney is
  - (a) Neuron
  - (b) Nephron
  - (c) Glomerulus
  - (d) Henles loop

PART B — (5 × 5 = 25 marks)

Answer ALL questions choosing either (a) or (b).  
Each answer should not exceed 250 words.

11. (a) Describe the structure and functions of glucose.  
Or  
(b) Describe the structure of amino acid.
12. (a) Describe the mechanism of enzymes.  
Or  
(b) Explain  $\beta$ -oxidation in details.
13. (a) Explain the origin and conduction of heart beat.  
Or  
(b) Write short note on ECG.
14. (a) Explain the mechanism of muscle contraction.  
Or  
(b) Explain the structure of neurons with neat labelled diagram.

15. (a) Write short note about Islets of Langerhans.

Or

(b) Write different phases of menstrual cycle.

PART C — (5 × 8 = 40 marks)

Answer ALL questions choosing either (a) or (b).  
Each answer should not exceed 600 words.

16. (a) Explain the classification of protein with examples.

Or

(b) Explain the classification of lipid.

17. (a) Write an essay on the role of enzymes in protein digestion.

Or

(b) Explain the Kerbs cycle.

18. (a) Give an account of transport of respiratory gases in blood.

Or

(b) Write an essay on mechanism of urine formation.

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19. (a) Explain the properties of skeletal muscles.

Or

(b) Explain different types of impulse conduction through nerves.

20. (a) "The pituitary gland is the master glands" - Justify.

Or

(b) Explain the role of Hormonal control in reproductive cycle.

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PART C — (5 × 8 = 40 marks)

Answer ALL questions choosing either (a) or (b).  
Each answer should not exceed 600 words.

16. (a) Give an account on innate immunity.  
Or  
(b) Explain the structure and functions of thymus and lymph node.
17. (a) Explain the general structure of Ig with suitable diagram.  
Or  
(b) List out the salient features of Ag - Ab reaction.
18. (a) Explain humoral immune response in detail.  
Or  
(b) Write an essay on tumour immunology.
19. (a) Give an account on culture media for bacterial growth.  
Or  
(b) Describe bacterial growth curve.
20. (a) Write an account on AIDS.  
Or  
(b) Explain the production of penicillin.
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Reg. No. : .....

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B.Sc. (CBCS) DEGREE EXAMINATION, APRIL 2023

Fifth Semester

Zoology — Core

IMMUNOLOGY AND MICROBIOLOGY

(For those who joined in July 2020 onwards)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

- Which of the following does not act as a protecting agent for the body surface?  
(a) Skin (b) Mucus  
(c) Gastric acid (d) Salivary amylase
- Which of the following cells is involved in humoral immunity?  
(a) T-cells (b) B-cells  
(c) Mast cells (d) None
- Name of the heavy chain of immunoglobulin 'G' is  
(a)  $\mu$  (b)  $\epsilon$   
(c)  $\alpha$  (d)  $\gamma$

4. Which immunoglobulin can pass through placenta?  
 (a) IgD (b) IgE  
 (c) IgM (d) IgG
5. What is the result of an abnormal response of the immune system to part of a person's own body?  
 (a) Passive immunity  
 (b) Cancer  
 (c) An allergic response  
 (d) Autoimmune disease
6. What are the solutions prepared from weakened or dead microorganisms, viruses or toxins that provide some immunity from disease?  
 (a) vaccines (b) histamines  
 (c) drugs (d) antibiotics
7. Bacteria having clusters of flagella at both poles of cells are known as?  
 (a) Amphitrichus (b) Monotrichous  
 (c) Peritrichus (d) Lophotrichous
8. Vaccination was invented by \_\_\_\_\_  
 (a) Watson (b) Jenner  
 (c) Crick (d) Pasteur
9. When was small pox eradicated from the world?  
 (a) 1971 (b) 1977  
 (c) 1967 (d) 1980

10. The most important characteristic symptom of rabies is \_\_\_\_\_  
 (a) fear of height (b) fear of water  
 (c) fear of cats (d) fear of fire

PART B — (5 × 5 = 25 marks)

Answer ALL questions choosing either (a) or (b).  
 Each answer should not exceed 250 words.

11. (a) Write a note on passive immunity.  
 Or  
 (b) Describe the structure of spleen.
12. (a) Explain agglutination reaction.  
 Or  
 (b) List out the biological properties of IgM.
13. (a) Distinguish the functions of T-lymphocytes.  
 Or  
 (b) Describe B-cell activation.
14. (a) Explain the structure of bacteria.  
 Or  
 (b) Explain the batch culture technique of bacterial growth.
15. (a) Give a brief account on food preservation.  
 Or  
 (b) Write an essay on measles.



PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. Choose scientist who devised the western blotting technique  
(a) Towbin (b) Darwin  
(c) De vries (d) Lamark
2. Tell the name of the host cell with rDNA  
(a) transformant (b) transformed cell  
(c) recombinant (d) all of these

3. Number of copies of plasmids present in the cell is called as \_\_\_\_\_  
(a) tetrads (b) copy number  
(c) diploids (d) pentaploids
4. The circular, double, extra chromosomal DNA is \_\_\_\_\_  
(a) Plasmids (b) RNA  
(c) DNA (d) Phage DNA
5. The \_\_\_\_\_ pH is maintained in the animal cell culture media.  
(a) 7-7.3 (b) 5.2-5.8  
(c) 10-11.9 (d) 2.2-2.6
6. Select the undifferentiated animal cell capable of proliferation to do specialized function is  
(a) stem cells (b) blood cells  
(c) fertilized cells (d) none
7. Write the gene which is used to treat a genetic disease is \_\_\_\_\_  
(a) gene drug (b) acethromycin  
(c) isotopes (d) drugs

8. The Dolly is the world's first cloned is \_\_\_\_\_  
(a) fish (b) mammal  
(c) reptiles (d) aves
9. One of the primary method of sewage treatment is \_\_\_\_\_  
(a) anaerobic (b) oxidation pond  
(c) sedimentation (d) aerobic process
10. Ethanol prepared from the bioresources are called \_\_\_\_\_  
(a) methanol (b) bioethanol  
(c) monilia (d) fusarium

PART B — (5 × 5 = 25 marks)

Answer ALL questions choosing either (a) or (b).  
Not exceeding 1 page.

11. (a) Examine the restriction enzymes as a tool of biotechnology.  
  
Or  
(b) Enumerate the gene transfer through electrophoration.

12. (a) Explain the DNA probe.  
  
Or  
(b) Illustrate the yeast artificial chromosome.
13. (a) Write down embryonic stem cell culture.  
  
Or  
(b) Interpret the advantages of Organ culture..
14. (a) Explain about Patenting in Biotechnology work.  
  
Or  
(b) Organize the salient features of Dolly.
15. (a) Role of genetically engineered microbes in bioremediation.  
  
Or  
(b) Summarize about the micro array.

PART C — (5 × 8 = 40 marks)

Answer ALL questions choosing either (a) or (b).  
Each answer should not exceed 600 words.

16. (a) Enumerate the northern blotting technique.

Or

- (b) Enumerate the methods of preparation of desired DNA from cell DNA.

17. (a) Discuss the characteristics of plasmid vectors.

Or

- (b) Summarize the gene amplification through PCR.

18. (a) Explain the production of monoclonal antibodies.

Or

- (b) Illustrate the culture of explants.

19. (a) Order the methods of enzyme immobilization. Explain it.

Or

- (b) Illustrate the various methods of gene therapy.

Page 5 Code No. : 20394 E

20. (a) Order the steps involved in Human genome project.

Or

- (b) Grade the types and applications of bioweapons.
- 

Page 6 Code No. : 20394 E

15. (a) Give a brief note on the uses of genetic engineering.

Or

(b) Explain the characteristics of plasmids.

PART C — (5 × 8 = 40 marks)

Answer ALL questions choosing either (a) or (b).  
Each answer should not exceed 600 words.

16. (a) Describe the functions of mitochondria.

Or

(b) Explain the functions of nucleus.

17. (a) Describe the chemical structure of DNA.

Or

(b) Write an essay on cancer cells.

18. (a) Describe the significance of erythroblastosis foetalis.

Or

(b) Describe the multiple alleles in man.

19. (a) Discuss about haemophilia.

Or

(b) Explain Alkaptonuria - as an inborn error of metabolism.

20. (a) Explain the importance of biotechnology.

Or

(b) Write an essay on cloning vectors.

Reg. No. : .....

Code No. : 20567 E      Sub. Code : CAZO 11

B.Sc. (CBCS) DEGREE EXAMINATION, APRIL 2023

First/Third Semester

Zoology — Allied

CELL BIOLOGY, GENETICS AND BIOTECHNOLOGY

(For those who joined in July 2021 onwards)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

- The controlling center of the cell is \_\_\_\_\_  
(a) Chromosome      (b) Nucleolus  
(c) Nucleus            (d) Golgi complex
- The chromosomes with the centromere in proximal end is known as  
(a) Telocentric        (b) Acrocentric  
(c) Metacentric       (d) Submetacentric



3. Double helix model of DNA was discovered by  
 (a) Robert Hooke (b) Robert Brown  
 (c) Pauling (d) Watson and Crick
4. Which one of the following is called as factories of protein synthesis?  
 (a) rRNA (b) DNA  
 (c) Ribosomes (d) Nucleus
5. \_\_\_\_\_ is the universal recipient blood group.  
 (a) A (b) B  
 (c) AB (d) O
6. If a person has antigen A and B in RBC, which antibody will be present in the serum?  
 (a) antibody A  
 (b) antibody B  
 (c) antibody A and B  
 (d) no antibody
7. Colour blindness gene is linked in \_\_\_\_\_ chromosome.  
 (a) X and Y (b) X  
 (c) Y (d) Autosome
8. The diagnostic test for phenyl ketouria is \_\_\_\_\_  
 (a) Guthrie's test (b) Ferrichloride test  
 (c) DNA probing (d) All the three
9. Which one of the following is the science of applied biological processor?  
 (a) Microtome (b) Biotechnology  
 (c) Bioreactors (d) Nanotechnology
10. The first sheep produced in cloning was named as  
 (a) Dolly (b) Bubby  
 (c) Darling (d) Jimmy

PART B — (5 × 5 = 25 marks)

Answer ALL questions choosing either (a) or (b).  
 Each answer should not exceed 250 words.

11. (a) Explain the functions of plasma membrane.  
 Or  
 (b) What are the different types of chromosomes?
12. (a) Describe the structure of RNA.  
 Or  
 (b) Mention the properties of cancer cells.
13. (a) Discuss the genetics of Rh blood group.  
 Or  
 (b) Explain the inheritance of skin colour in man.
14. (a) Give a brief account on dawn syndrome.  
 Or  
 (b) Write a brief note on albinism.

(6 Pages)

Reg. No. : .....

Code No. : 20568 E Sub. Code : CAZO 21

B.Sc. (CBCS) DEGREE EXAMINATION, APRIL 2023

Second/Fourth Semester

Zoology — Allied

DEVELOPMENTAL ZOOLOGY, ECOLOGY, ANIMAL  
PHYSIOLOGY AND EVOLUTION

(For those who joined in July 2021 onwards)

Time : Three hours Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. The hormone that is released from the testes is \_\_\_\_\_
- (a) progesterone
  - (b) vasopressin
  - (c) testosterone
  - (d) oxytocin

2. \_\_\_\_\_ is an organella that helps the sperm to penetrate the ovum.
- (a) Acrosome (b) Zona pellucida
  - (c) Megalium (d) None of the above
3. When one organism benefits and other is harmed, then it is known as \_\_\_\_\_
- (a) commensalism
  - (b) parasitism
  - (c) sexual reproduction
  - (d) all of them
4. One form of symbiosis is \_\_\_\_\_
- (a) Pearl (b) Sea anemone
  - (c) Commensalism (d) Ants
5. Name the enzyme used for branching of glycogen
- (a) Branching enzyme
  - (b) Hexokinase
  - (c) Phosphoglucomutase
  - (d) Glycogen synthase

6. What is the site for gluconeogenesis?
- (a) Liver (b) Blood  
(c) Muscles (d) Brain
7. Loop of Henle is connected with
- (a) Reproduction (b) Digestion  
(c) Excretion (d) Respiration
8. The blood is purified in \_\_\_\_\_
- (a) Kidney (b) Lungs  
(c) Heart (d) Intestine
9. The theory of natural selection was proposed by
- (a) Lamarck (b) Darwin  
(c) De vries (d) Hacekel
10. Darwinism cannot explain \_\_\_\_\_
- (a) Mimicry  
(b) Adaptation  
(c) Stuggle for existence  
(d) Tusks of elephants

PART B — (5 × 5 = 25 marks)

Answer ALL questions choosing either (a) or (b).  
Each answer should not exceed 250 words.

11. (a) Describe the structure of blastocyst.  
Or  
(b) Explain the structure of sperm.
12. (a) Comment on symbiosis.  
Or  
(b) Write a note on commensalism.
13. (a) Explain the digestion of carbohydrate.  
Or  
(b) Write an account on glycogenesis.
14. (a) Describe the structure of ovary.  
Or  
(b) Explain menstrual cycle in brief.
15. (a) Briefly explain coelomation.  
Or  
(b) Give an account on adaptation in birds.

PART C — (5 × 8 = 40 marks)

Answer ALL questions choosing either (a) or (b).  
Each answer should not exceed 600 words.

16. (a) Explain the nuclear transplantation in acetabularia.

Or

- (b) Write an essay on placenta in mammals.

17. (a) Explain the biological effects of temperature and light.

Or

- (b) Give an account on desert adaptation.

18. (a) Explain glycolysis.

Or

- (b) Explain the exchange of  $O_2$  and  $CO_2$  in blood and tissues.

19. (a) Describe the structure of nephron.

Or

- (b) Explain the structure of neurons.

20. (a) Discuss the theories of evolution.

Or

- (b) Write an account on mimicry.

PART C — (5 × 8 = 40 marks)

Answer ALL questions choosing either (a) or (b).

Each answer should not exceed 600 words.

16. (a) Describe the process of conjugation in paramecium.

Or

- (b) Write down the general features of phylum protozoa.

17. (a) Explain the life cycle of obelia with neat sketch.

Or

- (b) Write an essay on coral reefs.

18. (a) Write down the general character of platyhelminthes.

Or

- (b) Explain the life history of Ascaris.

19. (a) Describe the thoracic appendages of penaeus.

Or

- (b) Write an essay on social life in insects.

20. (a) Describe the reproductive system of pila.

Or

- (b) Write an account on larval forms of echinoderms and their significance.

Reg. No. : .....

Code No. : 20555 E Sub. Code : CMZO 11

B.Sc. (CBCS) DEGREE EXAMINATION, APRIL 2023

First Semester

Zoology — Core

INVERTEBRATA

(For those who joined in July 2021 onwards)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

- Father of modern taxonomy is  
(a) John Ray (b) Hackel  
(c) Aristotle (d) Linnaeus
- Protozoan are classified on the basis of  
(a) Habit (b) Locomotor organ  
(c) Reproduction (d) All of these



PART B — (5 × 5 = 25 marks)

3. The size and shape of the sponge is determined by  
(a) Chronocytes (b) Pincocytes  
(c) Osculum (d) Spicule
4. The phenomenon of metagenesis is exhibited in  
(a) Aurelia (b) Gorgonia  
(c) Obelia (d) Porpita
5. One of the following is hermaphrodite animal  
(a) Ascaris (b) Liverfluke  
(c) Filaria (d) None of these
6. The excretory organ present in earthworm  
(a) Kidney (b) Nephridia  
(c) Flame cells (d) Malpighian tubule
7. Which is not an arthropod?  
(a) Clam (b) Lobster  
(c) Centipede (d) Spider
8. Annelids have a  
(a) pseudocoelom (b) a true coelom  
(c) no coelom (d) none of the above
9. The number of arms present in octopus is  
(a) 6 (b) 8  
(c) 10 (d) 12
10. Star fish is included in the phylum  
(a) Echinodermata (b) Mollusca  
(c) Annelida (d) Arthropoda

Answer ALL questions choosing either (a) or (b).  
Each answer should not exceed 250 words.

11. (a) Explain the binomial nomenclature.  
Or  
(b) Write the classification of protozoa.
12. (a) Describe the body wall of heucosolenia.  
Or  
(b) Write an account of nematocyst.
13. (a) Explain the external morphology of Ascaris lumbricoides.  
Or  
(b) What is metamerism? Explain.
14. (a) Analyse the economic importance of lac insects.  
Or  
(b) Describe the cephalic appendages of prawn.
15. (a) Write the general characters of mollusca.  
Or  
(b) Write a note on pearl industry in India.





(6 Pages)

Reg. No. : .....

Code No. : 20556 E Sub. Code : CMZO 21

B.Sc. (CBCS) DEGREE EXAMINATION, APRIL 2023

Second Semester

Zoology — Core

CHORDATA

(For those who joined in July 2021 onwards)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

- Members of order Dipnoi are commonly known as  
(a) pipe fishes (b) cow fishes  
(c) cat fishes (d) lung fishes
- Which of the following is not an accessory respiratory organ in fishes?  
(a) Skin or integument  
(b) Pectoral fins  
(c) Pelvic fins  
(d) Gut epithelium

- Excretion in amphibians is  
(a) Ammonotelic (b) Aminotelic  
(c) Ureotelic (d) Uricotelic
- The third eyelid in frog is called \_\_\_\_\_  
(a) Pineal eye  
(b) Upper eyelid  
(c) Lower eyelid  
(d) Nictitating membrane
- In calotes, shedding of scally covering periodical in flakes is  
(a) Neoteny (b) Metamorphosis  
(c) Ecdysis (d) Pupation
- Which one of the following is poisonous snake?  
(a) Typhlops (b) Cobras  
(c) Ptyas (d) Python
- Birds are *ureotelic* animals because the excre waste consists of mainly urates and \_\_\_\_\_  
(a) uric acid (b) urea  
(c) ammonia (d) aminoacid

8. *Columba livia* is commonly called as  
(a) Pigeon (b) Swifts  
(c) Parrots (d) Wood peckers
9. Marsupium is present in  
(a) Monotremes (b) Insectivores  
(c) Chiropterans (d) Marsupialia
10. Largest mammalian order is  
(a) Logomorpha (b) Rodentia  
(c) Cetacea (d) Sirenia

PART B — (5 × 5 = 25 marks)

Answer ALL questions choosing either (a) or (b).  
Each answer should not exceed 250 words.

11. (a) Enlist the affinities of *Balanoglossus* with other animals.
- Or
- (b) Bring out the important characters of major classes of vertebrates with examples.

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12. (a) Discuss about any three orders of classification of amphibia.

Or

- (b) Write the general characters of amphibia.

13. (a) Explain the general character of reptiles.

Or

- (b) Examine the features present in female reproductive system of *Calotes*.

14. (a) Describe different kinds of bird migration.

Or

- (b) Explain the different flight adaptations in birds.

15. (a) Describe the structure of rabbit skin and enumerate its functions.

Or

- (b) Explain the adaptive radiation in aquatic mammals.

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[P.T.O.]





PART C — (5 × 8 = 40 marks)

Answer ALL questions choosing either (a) or (b).

Each answer should not exceed 600 words.

16. (a) Discuss about retrogressive metamorphosis in Ascidian.

Or

- (b) Discuss about the different accessory respiratory organs in fishes.

17. (a) Give general account on metamorphosis of amphibians.

Or

- (b) Explain about parental care in amphibia.

18. (a) Describe the digestive system of a Calotes. How these are suited to their feeding habits?

Or

- (b) How do you identify poisonous and non-poisonous snakes?

19. (a) Describe the circulatory system of in Pigeon.

Or

- (b) Describe the respiratory mechanism and organs of respiration in *Columba*.

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20. (a) Describe the female urino-genital organs of rabbit.

Or

- (b) Explain about dentition in mammals.
- 

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(6 pages)

Reg. No. : .....

Code No. : 20558 E Sub. Code : CMZO 41

B.Sc. (CBCS) DEGREE EXAMINATION, APRIL 2023

Fourth Semester

Zoology — Core

GENETICS

(For those who joined in July 2021 onwards)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. The genotype which consists of only one type of allele is called
  - (a) Heterozygous
  - (b) Homozygous
  - (c) Synapsis
  - (d) Non-allelic

2. ABO group is the example for \_\_\_\_\_
  - (a) Lethal gene
  - (b) Complete dominance
  - (c) Codominance
  - (d) Incomplete dominance
3. Sickle cell anaemia is caused by \_\_\_\_\_
  - (a) Gene mutation
  - (b) Vitamin deficiency
  - (c) Conjugation
  - (d) Transformation
4. Linkage theory was proposed by \_\_\_\_\_
  - (a) Mendal
  - (b) James
  - (c) Crick
  - (d) Morgan
5. Which one of the following is not a sex determination factor?
  - (a) Chromosomes
  - (b) Vitamins
  - (c) Barbodies
  - (d) Hormones
6. Failure of separation of homologous chromosome is \_\_\_\_\_
  - (a) Heterosis
  - (b) Mutation
  - (c) Non-disjunction
  - (d) Back cross

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7. The Y-linked genes are also called \_\_\_\_\_
  - (a) Lethal gene
  - (b) Holandric gene
  - (c) Sex-linked gene
  - (d) All the above
8. In born errors of metabolism is due to the expression of \_\_\_\_\_
  - (a) Recessive gene
  - (b) Dominant gene
  - (c) Lethal gene
  - (d) Holandsic gene
9. The superiority of the hybrid is called
  - (a) Sterile
  - (b) Heterosis
  - (c) Homozygotes
  - (d) All the above
10. Kappa particles in paramecium is an example of
  - (a) Cytoplasmic inheritance
  - (b) Gene flow
  - (c) Bacterial transformation
  - (d) Bacterial conjugation

PART B — (5 × 5 = 25 marks)

Answer ALL questions choosing either (a) or (b).  
Each answer should not exceed 250 words.

11. (a) Describe monohybrid cross to prove Mendel's law of segregation.  
Or  
(b) Give an account of lethal genes in man.

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12. (a) Write a brief note on construction of chromosome map.  
Or  
(b) What are mutagens? Explain their mode of action.
13. (a) Explain the types of sex linked inheritance.  
Or  
(b) Write short note about Klinefelter's syndrome.
14. (a) What is inbreeding? Write about the merits and demerits of inbreeding.  
Or  
(b) Explain briefly about the pedigree analysis.
15. (a) Write short notes on promoters sequence of a gene.  
Or  
(b) Explain the operon hypothesis.

Page 4 Code No. : 20558 E  
[P.T.O.]

PART C — (5 × 8 = 40 marks)

Answer ALL questions choosing either (a) or (b).  
Each answer should not exceed 600 words.

16. (a) Explain the phenomenon of epistasis and lethal genes.

Or

- (b) Explain in detail about the human blood group controlled by multiple alleles.

17. (a) Explain the mechanism and the factors affecting the crossing over.

Or

- (b) What is DNA repair? Explain the mechanisms of DNA repair seen in living cells.

18. (a) Explain the sex determination in man.

Or

- (b) Write an essay on cytoplasmic inheritance with examples.

19. (a) Give an account of genetic counselling.

Or

- (b) Explain the Hardy - Weinberg law with suitable examples.

Page 5 Code No. : 20558 E

20. (a) Describe the following :

- (i) Transposon  
(ii) Satellite DNA.

Or

- (b) Give an account of bacterial recombination.

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(6 pages)

Reg. No. : .....

Code No. : 20563 E Sub. Code : CNZO 31

U.G. (CBCS) DEGREE EXAMINATION, APRIL 2023

Third Semester

Zoology

Non Major Elective — BEE KEEPING

(For those who joined in July 2021 onwards)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. *Apis dorsata* also called as 'giant honeybee'
  - (a) small honeybee
  - (b) giant honeybee
  - (c) middle honeybee
  - (d) none of the above

6. The most common predators faced by honey bees are
  - (a) skunks
  - (b) bears
  - (c) hive beetles
  - (d) all the above
7. In \_\_\_\_\_, the bees build honey comb in the frames, which can be move easily.
  - (a) Langstroth hive
  - (b) Neuton hive
  - (c) Artificial hive
  - (d) All the above
8. Beekeepers use bee smoker to puff smoke into their hives, this smoke is \_\_\_\_\_
  - (a) harm to bees
  - (b) doesn't harm bees
  - (c) warm to bees
  - (d) all the above
9. Honey extraction is the process in beekeeping of removing honey from \_\_\_\_\_
  - (a) honey wings
  - (b) honey comb
  - (c) honey legs
  - (d) all the above
10. \_\_\_\_\_ is a product made from the honeycomb of the honeybee.
  - (a) Beeswax
  - (b) Bees waste
  - (c) Beeswax oils
  - (d) All the above

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2. The workers and queens have stingers, whereas the drones are
  - (a) sting
  - (b) stingless
  - (c) small sting
  - (d) all the above
3. Honey is formed from nectar collected by bees from the \_\_\_\_\_
  - (a) leaves
  - (b) stem
  - (c) flowers
  - (d) all the above
4. Beekeepers are also known as \_\_\_\_\_
  - (a) apiarists
  - (b) artists
  - (c) housekeeping
  - (d) none of the above
5. A honey comb is a mass of hexagonal prismatic wax cells built by honey bees in their nests contain their larvae and stores of \_\_\_\_\_
  - (a) honey and wax
  - (b) honey and pollen
  - (c) honey and waste
  - (d) all the above

Page 2 Code No. : 20563 E

PART B — (5 × 5 = 25 marks)

Answer ALL questions choosing either (a) or (b).

Each answer should not exceed 250 words.

11. (a) Write a short note on little bee.

Or

(b) How a bee becomes queen?
12. (a) Describe the relationship between bees and flowers.

Or

(b) Why is migratory beekeeping important?
13. (a) What care should be taken while purchasing honey bee colonies?

Or

(b) What are the most common diseases of bees?
14. (a) What are the requirements need to start a honey bee colony?

Or

(b) What are the parts of a modern bee hive?

Page 4 Code No. : 20563 E

[P.T.O.]



15. (a) Describe the different methods of extracting honey.

Or

- (b) Write a detailed account on preservation of honey. How long can you preserve honey?

PART C — (5 × 8 = 40 marks)

Answer ALL questions choosing either (a) or (b).  
Each answer should not exceed 600 words.

16. (a) Give a detailed account on life cycle of worker bee.

Or

- (b) What are the different role of bees in a beehive?

17. (a) Explain the manage beekeeping to get more honey.

Or

- (b) What are the factors to be considered to manage disease in an apiary?

18. (a) Describe the process of swarming. What are the factors which causes swarming in?

Or

- (b) How do you protect a bee colony from their enemies?

19. (a) Discuss about the equipments of apiary.

Or

- (b) How do you transfer bees from their hive?

20. (a) What are the chemical and physical properties of honey?

Or

- (b) Explain the importance of honey.

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. The amount of interaction a person has with their community is called \_\_\_\_\_.
- (a) Mental health  
(b) Inner health  
(c) Social health  
(d) None

7. Hydrophobia means fear to \_\_\_\_\_.
- (a) water (b) food  
(c) helminthes (d) fruits
8. Acquired immunodeficiency syndrome is a chronic disease caused by \_\_\_\_\_.
- (a) human virus  
(b) human immunodeficiency virus  
(c) deficiency virus  
(d) deficiency disease
9. India has a vision of a malaria free country by the year \_\_\_\_\_.
- (a) 2027 (b) 1990  
(c) 2021 (d) 2020
10. Write who helped to prepare the Primary Health Center concept paper
- (a) Thomas edition  
(b) Kennet  
(c) Kenneth Newell  
(d) All of them

2. Choose one of the birth control measure \_\_\_\_\_.
- (a) spermicide (b) fungicide  
(c) herbicide (d) pesticide
3. A bacterium vibrio cholerae causes \_\_\_\_\_.
- (a) TB (b) Cholera  
(c) AIDS (d) Pneumonia
4. The main primary sources of water are \_\_\_\_\_.
- (a) well  
(b) surface water and groundwater  
(c) sea  
(d) none
5. Write the microbes which can be transmitted by person-to-person via the fecal-oral route
- (a) HIV  
(b) Escherichia coli  
(c) Bacillus tropicus  
(d) Bacillus
6. Select the basic material for maintaining hygiene
- (a) clothes (b) food  
(c) water (d) none

PART B — (5 × 5 = 25 marks)

Answer ALL questions choosing either (a) or (b).

Each answer should not exceed 250 words.

11. (a) Define the quality of life index.
- Or
- (b) Recall the positive health.
12. (a) Discuss the uses of water.
- Or
- (b) Summarize the importance of ventilation.
13. (a) Discuss the sanitary health during festivals.
- Or
- (b) Explain the need of disposing excreta.
14. (a) Appraise the causatives and symptoms of amoebiosis.
- Or
- (b) Explain the causative agents and symptoms of filariasis.

15. (a) Measure the role of National Malaria eradication programme.

Or

(b) Explain the national AIDS control programme.

PART C — (5 × 8 = 40 marks)

Answer ALL questions choosing either (a) or (b).

16. (a) Enumerate the birth control and its importance.

Or

(b) List out the food toxicants and its effects.

17. (a) Examine the causatives, symptoms of ascariasis.

Or

(b) Discuss the various sources of water.

18. (a) Discuss the first aid for an accidents.

Or

(b) Write down the sanitary steps taken during travelling.

Page 5 Code No. : 20565 E

19. (a) Order the causative agents and symptoms of viral disease.

Or

(b) Explain the causative agents, symptoms and control measures of typhoid.

20. (a) Grade the functions of PHC.

Or

(b) Write the national tuberculosis control programmes.

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05/06/23 A/W

(6 pages)

Reg. No. : .....

Code No. : 20560 E

Sub. Code : CSZO 32

B.Sc. (CBCS) DEGREE EXAMINATION, APRIL 2023

Third Semester

Zoology

Skill Based Core — NUTRITION AND DIETETICS

(For those who joined in July 2021 onwards)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. Which one of the following is used as long term energy storage by animals?
  - (a) fat
  - (b) carbohydrate
  - (c) protein
  - (d) vitamins



2. The dried pulses are the good sources of many \_\_\_\_\_ and minerals but deficient in vitamins A, D, B<sub>12</sub> and C.
- (a) fat
  - (b) carbohydrate
  - (c) vitamin-B complex
  - (d) aminoacids
3. Bran of \_\_\_\_\_ rice has more oil.
- (a) roasted
  - (b) raw
  - (c) parboiled
  - (d) sieved
4. Glycolysis is the breakdown (lysis) of glucose to \_\_\_\_\_ under aerobic conditions and to lactic acid under anaerobic conditions.
- (a) ketoglutaric acid
  - (b) succinic acid
  - (c) acetic acid
  - (d) pyruvic acid
5. The bomb calorimeter is used to determine the \_\_\_\_\_ of solid and liquid fuels.
- (a) concentration
  - (b) calorific value
  - (c) nutritive value
  - (d) density

6. Prolonged \_\_\_\_\_ lowers the metabolic rate.
- (a) under nutrition
  - (b) over nutrition
  - (c) normal nutrition
  - (d) sleep
7. Find out which one is an increased nutrient required during lactation
- (a) Iodine
  - (b) vitamin A rich foods
  - (c) fats
  - (d) cholesterol
8. Kwashiorkor is a type of nutrition deficiency disorder, which results from a severe \_\_\_\_\_ deficiency.
- (a) fat
  - (b) carbohydrate
  - (c) protein
  - (d) nucleic acids
9. Which one is called good cholesterol transporter to prevent arteriosclerosis?
- (a) LDL
  - (b) HDL
  - (c) VLDL
  - (d) MDL
10. \_\_\_\_\_ (presence of glucose in urine) may be the first indicator of diabetes mellitus.
- (a) proteinuria
  - (b) glycosuria
  - (c) albuminuria
  - (d) hematuria

PART B — (5 × 5 = 25 marks)

Answer ALL questions choosing either (a) or (b).

Each answer should not exceed 250 words.

11. (a) Highlight the important role of carbohydrates.

Or

- (b) Specify the nutritive values of cereals and pulses.

12. (a) List out the main principles of parboiling of rice.

Or

- (b) Non-vegetarian Vs Vegetarian diet : which one is better and why?

13. (a) How bomb calorimeter is constructed and add notes on its uses?

Or

- (b) List out factors that affecting basal metabolic rate.

14. (a) How to design nutritional requirements for pregnant women?

Or

(b) Summarize causes, and preventive measures for obesity.

15. (a) Write an account on therapeutic diet.

Or

(b) Bring out causes and preventive measures of atherosclerosis.

PART C — (5 × 8 = 40 marks)

Answer ALL questions choosing either (a) or (b).

Each answer should not exceed 600 words.

16. (a) Summarize the different functions of fat soluble vitamins.

Or

(b) Tabulate biochemical importance of water soluble vitamins.

17. (a) Discuss about advantages of parboiling of rice.

Or

(b) Write an account on metabolism of lipids.

18. (a) How to determine the BMR by using Benedict's method?

Or

(b) Define BMR and State significance of BMR.

19. (a) Differentiate between Kwashiorkor and Marasmus.

Or

(b) How do design nutritional requirements for lactating women?

20. (a) Bring out causes and preventive measures of diabetes mellitus.

Or

(b) Bring out causes and preventive measures of constipation.

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(6 pages)

Reg. No. : .....

Code No. : 20562 E Sub. Code : CSZO 42

B.Sc. (CBCS) DEGREE EXAMINATION, APRIL 2023

Fourth Semester

Zoology

Skill Based Core — VERMITECHNOLOGY

(For those who joined in July 2021 onwards)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. Name the phylum which includes metamericly segmented, worm like animals  
(a) arthropoda (b) annelida  
(c) molluska (d) coelenterates
2. Earth worms are \_\_\_\_\_ feeders.  
(a) carnivorous (b) omnivorous  
(c) detritus (d) herbivorous

3. A common earthworm found in South India is \_\_\_\_\_  
(a) Peripatus (b) Periplaneta  
(c) Megascolex (d) Limulus
4. Earthworms, which live below ground is called \_\_\_\_\_  
(a) epigenic (b) endogeic  
(c) agenic (d) all of them
5. Write the mostly used method for vermicomposting in larger scale is \_\_\_\_\_  
(a) pile method (b) tray method  
(c) pot method (d) all the these
6. Write the main raw material necessary for vermicomposting  
(a) cow dung (b) water  
(c) urea (d) none
7. Select a liquid extract produced from vermicompost medium is \_\_\_\_\_  
(a) compost (b) vermiwash  
(c) castings (d) none

8. The diseases which are treated by earthworms are \_\_\_\_\_

- (a) bladder stones (b) jaundice
- (c) both (a) and (b) (d) AIDS

9. Two main methods of large-scale vermicomposting are \_\_\_\_\_

- (a) windrow and raised bed
- (b) heap method
- (c) tray method
- (d) pit method

10. NHM is the financial assistance, provided for fixing a vermicompost production units

- (a) National Horticulture Mission
- (b) National Health Mission
- (c) National Agri Mission
- (d) None

PART B — (5 × 5 = 25 marks)

Answer ALL questions choosing either (a) or (b).  
Each answer should not exceed 250 words.

11. (a) Describe the meganephridium of earth worms.

Or

(b) Recognize the importance of body setae and penial setae of earth worm.

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12. (a) Discuss the advantages of vermicomposting.

Or

(b) Summarize an exotic species of earthworms.

13. (a) Write a note on the pot method of vermicomposting.

Or

(b) Write short note on the changes takes place during of vermicomposting.

14. (a) Earth worm as a bioreactor. Explain.

Or

(b) Explain the uses of vermicomposting inland improvement.

15. (a) Orderly arranges the role of government in vermiculture.

Or

(b) Summarizes about large scale production of vermicompost.

Page 4 Code No. : 20562 E  
[P.T.O.]

PART C — (5 × 8 = 40 marks)

Answer ALL questions choosing either (a) or (b).

Each answer should not exceed 600 words.

16. (a) Enumerate the female reproductive system of earthworm.

Or

- (b) Identify the components of digestive system of earthworm.

17. (a) Discuss the various steps involved in vermiculture techniques.

Or

- (b) Describe the species used in vermicomposting.

18. (a) Write the note on the heap method and tray method of vermiculture.

Or

- (b) Write a note on raw materials needed for vermicomposting.

Page 5 Code No. : 20562 E

19. (a) Explain in detail about medicinal value of earth worm.

Or

- (b) Illustrate the production and composition and uses of vermi wash.

20. (a) Explain the packaging and marketing the vermicompost.

Or

- (b) Summarize the influences of chemical inputs on earthworm activities.

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(6 Pages)

Reg. No. : \_\_\_\_\_

Code No. : 20254 E Sub. Code : SMZO 61/  
AMZO 61

B.Sc. (CBCS) DEGREE EXAMINATION, APRIL 2023

Sixth Semester

Zoology — Core

EVOLUTION

(For those who joined in July 2017 onwards)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL the questions.

Choose the correct answer :

1. The \_\_\_\_\_ is called as age of fish.
- (a) Pennsylvanian period
  - (b) Devonian period
  - (c) Permian period
  - (d) All the above

2. The mutation theory was proposed by \_\_\_\_\_
- (a) De vries (b) Mendel
  - (c) Pasteur (d) Dobzansky
3. A new, modified theory of Lamarckism is called \_\_\_\_\_
- (a) neo Darwinism (b) Darwinism
  - (c) neo lamarkism (d) lamarkism
4. The neo Darwinism was proposed by \_\_\_\_\_
- (a) August Weismann
  - (b) Wallace
  - (c) Fisher
  - (d) Kettlewell
5. The raw material for the evolution is \_\_\_\_\_
- (a) Variation (b) Adaptation
  - (c) Colouration (d) Isolation
6. When the species becomes fragmented by polyploidy \_\_\_\_\_ speciation occurs.
- (a) sympatric (b) allopatric
  - (c) true (d) phyletic

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7. Counter shading mechanism is a \_\_\_\_\_
- (a) protective colouration
  - (b) alluring colouration
  - (c) warning colouration
  - (d) none
8. The organism which exhibits mimicry is called \_\_\_\_\_
- (a) model (b) mimic
  - (c) adaptation (d) selection
9. The first true man was \_\_\_\_\_
- (a) Homo sapiens
  - (b) Homo erectus
  - (c) Neanderthal man
  - (d) Cro magnon man
10. The palaeartic, nearctic, ethiopian and oriental regions are together called \_\_\_\_\_
- (a) metagea (b) neogea
  - (c) notogea (d) holarctic

Page 3 Code No. : 20254 E

PART B — (5 × 5 = 25 marks)

Answer ALL questions choosing either (a) or (b).

Each answer should not exceed 250 words.

11. (a) Define analogous organs with suitable examples.  
Or  
(b) Enumerate on mesozoic era.
12. (a) Explain the natural selection theory.  
Or  
(b) Discuss the criticism of Lamarckism.
13. (a) Write down the geographical isolation.  
Or  
(b) Explain the Hardy Weinberg law.
14. (a) Organize the warning mimicry.  
Or  
(b) Illustrate the arboreal adaptation.
15. (a) Persuade the salient features of neotropical region.  
Or  
(b) Orderly arrange the causes for human evolution.

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[P.T.O.]

PART C — (5 × 8 = 40 marks)

Answer ALL questions choosing either (a) or (b).

Each answer should not exceed 600 words.

16. (a) Enumerate the paleontological evidences.

Or

- (b) Describe the homologous organs with examples.

17. (a) Discuss the Lamarckian principles.

Or

- (b) Summarize the natural selection and types.

18. (a) Explain the sources of variations.

Or

- (b) Illustrate the seasonal isolation and ecological isolations.

19. (a) Explain the different types of mimicry.

Or

- (b) Explain the adaptations found in the desert animal.

20. (a) Summarize the characteristics of Australian region.

Or

- (b) Discuss the evolution of man as seen in fossil record.



Code No. : 20255 E Sub. Code : SMZO 62

B.Sc. (CBCS) DEGREE EXAMINATION, APRIL 2023

Sixth Semester

Zoology — Core

## IMMUNOLOGY AND MICROBIOLOGY

(For those who joined in July 2017–2019)

Time : Three hours

Maximum : 75 marks

## PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. \_\_\_\_\_ is the ability to recognize germs and prevent the body from illness.
  - (a) Immunity
  - (b) Pathogen
  - (c) Antigen
  - (d) Antibody
  
6. Different types of tumor are \_\_\_\_\_.
  - (a) benign                      (b) premalignant
  - (c) malignant                  (d) all the above
  
7. Proliferation of bacterium into two daughter cells, is called \_\_\_\_\_.
  - (a) binary fission      (b) mitosis
  - (c) division                  (d) all the above
  
8. Batch culture is a \_\_\_\_\_ system that contains limited amounts of nutrients.
  - (a) open culture
  - (b) closed culture
  - (c) semi closed culture
  - (d) all the above
  
9. Amoxicillin is a newer version of \_\_\_\_\_ that control more types of bacteria.
  - (a) fungus                      (b) penicillin
  - (c) bacterial                      (d) all the above

2. T-lymphocytes are the part of immune system which develops from bone marrow is \_\_\_\_\_.
  - (a) T-lymphocytes      (b) Stem cells
  - (c) Red blood cell      (d) All the above
  
3. High levels of IgG indicate \_\_\_\_\_ in the body.
  - (a) an infection
  - (b) un infection
  - (c) an antibody reaction
  - (d) all the above
  
4. Cytolysis is often used as a tool of \_\_\_\_\_ by various cells.
  - (a) autolysis                  (b) cytolysis
  - (c) survival                      (d) killing cell
  
5. \_\_\_\_\_ are a type of lymphocyte that are responsible for the humoral immunity.
  - (a) B-cell                      (b) Stem cells
  - (c) T-cell                          (d) Rbc cell

10. Gonorrhoea is an infection caused by a sexually transmitted bacterium that infects \_\_\_\_\_.
  - (a) males
  - (b) females
  - (c) both male and female
  - (d) none of the above

## PART B — (5 × 5 = 25 marks)

Answer ALL questions choosing either (a) or (b).

Each answer should not exceed 250 words.

11. (a) What are the two types of innate immunity?  
Or  
(b) Describe the structure and function of spleen.
  
12. (a) Describe the different stages of antigen-antibody reaction.  
Or  
(b) What are the biological properties of immunoglobulins?
  
13. (a) Explain the role of T cells in immune system.  
Or  
(b) What is the difference between a humoral and cell mediated immune response?

14. (a) Describe the structures of bacteria.

Or

(b) What are the four phases of bacterial growth curve?

15. (a) How can we prevent and control tuberculosis?

Or

(b) Describe the causes symptoms and prevention of AIDS.

PART C— (5 × 8 = 40 marks)

Answer ALL questions choosing either (a) or (b).  
Each answer should not exceed 600 words.

16. (a) What are primary lymphoid organs explain their structure and function?

Or

(b) Explain the importance and scope of immunology.

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17. (a) List out the common types of antigen - antibody.

Or

(b) What is agglutination and explain the types of agglutination reactions?

18. (a) Write about the difference between macrophages and B cells.

Or

(b) Describe the process of humoral immunity.

19. (a) What is selective medium? Explain with suitable examples.

Or

(b) What are the general structure and characteristics of viruses?

20. (a) Describe the biological nitrogen fixation describe roles of microbes in it.

Or

(b) What is polio what are its causes, symptoms and prevention?

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B.Sc. (CBCS) DEGREE EXAMINATION, APRIL 2023

Sixth Semester

Zoology — Core

BIostatistics, COMPUTER APPLICATIONS AND  
BIOINFORMATICS

(For those who joined in July 2017 onwards)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

- Select the name of the pictorial representation of data \_\_\_\_\_  
(a) pictogram (b) pie diagram  
(c) line (d) none

- Select the variable which occurs most frequently \_\_\_\_\_  
(a) mean (b) mode  
(c) median (d) none
- The standard deviation is also known as \_\_\_\_\_  
(a) standard error (b) mean square error  
(c) mean (d) average
- When both the variables are moving in the same direction, that correlation is said to be \_\_\_\_\_  
(a) negative correlation  
(b) positive correlation  
(c) simple correlation  
(d) partial correlation
- Input device of the computer is \_\_\_\_\_  
(a) keyboard (b) mouse  
(c) joysticks (d) all of these
- The main storage unit in computer system is \_\_\_\_\_  
(a) Memory (b) Output unit  
(c) Central unit (d) Input unit

- Recall the branch which deals with the application of tools of computation and interpretation of biological data.  
(a) biostatistics  
(b) computer science  
(c) bioinformatics  
(d) cybersecurity
- \_\_\_\_\_ is used to find regions of local similarity between sequences.  
(a) BLAST  
(b) SWISS PROT  
(c) NCBI  
(d) ELISA
- The PDB viewer is used to prepare, initiate and evaluate the \_\_\_\_\_ modeling process.  
(a) Alignment (b) Pub med  
(c) Homology (d) None of these
- Select the tool which is used for visualizing the proteins and nucleic acids  
(a) Ras mol  
(b) Pub med  
(c) Spread sheet  
(d) None of these

PART B — (5 × 5 = 25 marks)

Answer ALL questions choosing either (a) or (b).  
Each answer should not exceed 250 words.

- (a) Identify the pie diagram.  
Or  
(b) State the types of variables.
- (a) Explain the range.  
Or  
(b) Discuss the chi square test.
- (a) Write a note on World Wide Web.  
Or  
(b) Write short note on generations of computers.
- (a) Orderly arrange the scope and applications of bioinformatics.  
Or  
(b) Explain the input devices of computer.
- (a) Explain the protein sequence data base.  
Or  
(b) Summarize the Locus link.

PART C — (5 × 8 = 40 marks)

Answer ALL questions choosing either (a) or (b).  
Each answer should not exceed 600 words.

16. (a) Enumerate the diagrammatic representation of data.

Or

- (b) Identify the different sampling methods.

17. (a) Discuss Karl Pearson correlation coefficient.

Or

- (b) Calculate the standard deviation for the given data.

x	10	20	30	40	50	60
f	8	12	20	10	7	3

18. (a) Write the uses of internet in biology.

Or

- (b) Write a note on role of MS power point in biology.

19. (a) Explain in detail about multiple sequence alignment.

Or

- (b) Explain pair wise sequence comparison.

20. (a) Explain the following (i) ENTREZ (ii) Nucleic acid sequence database.

Or

- (b) Summarize : SWISS-PROT.
-



(6 pages)

Reg. No. : .....

Code No. : 20271 E Sub. Code : SNZO 4 A/  
- ANZO 41

U.G. (CBCS) DEGREE EXAMINATION, APRIL 2023.

Fourth Semester

Zoology

Non-Major Elective – PUBLIC HEALTH AND  
HYGIENE

(For those who joined in July 2017 – 2020 onwards)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL the questions.

Choose the correct answer :

1. One egg yields about \_\_\_\_\_ of energy.  
(a) 50 Kcal (b) 60 Kcal  
(c) 70 Kcal (d) 80 Kcal
2. The suggested doctor-population ratio in India  
(a) 1 per 1000 people  
(b) 1 per 3000 people  
(c) 1 per 3500 people  
(d) 1 per 4000 people

8. The best method to prevent pulmonary tuberculosis is \_\_\_\_\_.  
(a) Case Isolation  
(b) Treatment of cases  
(c) BCG Vaccination  
(d) Chemoprophylaxis
9. PHC was introduced as a result of \_\_\_\_\_ report.  
(a) Mudaliar  
(b) Kartar Singh  
(c) Planning commission  
(d) Bore committee
10. The national TB control programme is implemented through  
(a) PHC  
(b) UHC  
(c) District TB Hospital  
(d) All of the above

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3. Which of the following is not a type of waste water?  
(a) Sullage (b) Sewage  
(c) Grey water (d) Black water
4. Water is to be treated if its hardness is more than  
(a) 1 meq/L (b) 3 meq/L  
(c) 5 meq/L (d) 100 meq/L
5. Controlled tipping is an effective method for the disposal of  
(a) Sewage (b) Sullage  
(c) Human excreta (d) Refuse
6. The sewage is said to be strong when its BOD is about  
(a) 50 ppm (b) 100 ppm  
(c) 150 ppm (d) 300 ppm
7. Which one of the following is a water borne disease?  
(a) Influenza (b) Small Pox  
(c) Malaria (d) Cholera

Page 2 Code No. : 20271 E

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 250 words.

11. (a) Explain about the Vasectomy.  
Or  
(b) Explain human development Index with reference to India.
12. (a) Illustrate the scientific features of Bacillary dysentery.  
Or  
(b) Describe the Ascariasis.
13. (a) Write a short note on food sanitation for fair and festivals.  
Or  
(b) How does the authority control infectious disease during fair and festival?
14. (a) Give an account on Protozoan disease of Amoebiasis.  
Or  
(b) Explain the structure of rabies virus.

Page 4 Code No. : 20271 E

[P.T.O.]



15. (a) Write a brief account of the national tuberculosis control programme.

Or

(b) Comment on WHO.

PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 600 words.

16. (a) Write a detailed account on positive health.

Or

(b) Define quality of health index.

17. (a) How do you maintain houses for healthy living?

Or

(b) Give a detailed account of human requirements for long living.

18. (a) Explain the pit latrines and pore hole latrines.

Or

(b) Explain the social aspects of excreta disposal in India.

19. (a) Define communicable diseases. Explain the Hepatitis B disease.

Or

(b) Write a detailed account of typhoid fever.

20. (a) Explain the national health Programme currently practiced in India.

Or

(b) Give the activities of the National AIDS control Programme.

Reg. No. : .....

Code No. : 7451

Sub. Code : ZZOM 31

M.Sc. (CBCS) DEGREE EXAMINATION,  
NOVEMBER 2023

Third Semester

Zoology – Core

COMPARATIVE ANIMAL PHYSIOLOGY

(For those who joined in July 2021-2022 onwards)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. Identify the kind of adaptations found in the desert animal.
  - (a) impervious skin
  - (b) goblet cells
  - (c) pneumatophores
  - (d) stream lined body
2. Name the ability of organisms to maintain internal stability in response to the changes.
  - (a) osmoregulation
  - (b) homeostasis
  - (c) diffusion
  - (d) inheritance

3. Select the animal in which hypotonic body fluid is maintained.  
(a) marine protozoa (b) marine fish  
(c) fresh water fish (d) endoparasites
4. Show one of the following which helps to excrete out the excess salts in the marine fish.  
(a) Lungs  
(b) kidney  
(c) glomerular kidney  
(d) chloride secretory cells
5. Write down the blue coloured respiratory pigment.  
(a) haemocyanin (b) haemoglobin  
(c) echinochrome (d) chlorocruorin
6. Predict the total capacity of the human lung  
(a) 1-2 lit (b) 5-6 lit  
(c) 7-8 lit (d) 3 lit
7. Select the excretory products of Reptiles and birds.  
(a) urea (b) ammonia  
(c) uric acid (d) creatine
8. Select the term related with the process of producing milk from the mammary gland.  
(a) parturition (b) child birth  
(c) adsorption (d) Lactation
9. Choose the name of the junction formed between two neurons.  
(a) synapse (b) synopsis  
(c) erythroptosis (d) neurosis

10. Select one of the neural degenerative disease.  
(a) cancer (b) Parkinson's disease  
(c) leprosy (d) dysentery

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 250 words.

11. (a) Enumerate the extreme terrestrial environment.  
Or  
(b) Differentiate Acclimation and Acclimatization
12. (a) Explain the meditation and its effect.  
Or  
(b) Illustrate the physiological adaptation to osmotic stress.
13. (a) Illustrate the transport of gases between lung and tissues.  
Or  
(b) Illustrate the Bohr effect.
14. (a) Summarises about gonadal axis.  
Or  
(b) Differentiate amminotelism and Uricotelism.
15. (a) Summarises the neurotransmitters and its uses.  
Or  
(b) Defend the Muscle contraction process.



PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 600 words.

16. (a) Explain about stress avoidance and stress tolerance.

Or

- (b) Enumerate the adaptation found in the Desert animal.

17. (a) Explain the osmoregulation in marine environment.

Or

- (b) Associate the Yoga and good health.

18. (a) Explain the functions of respiratory pigments.

Or

- (b) Write down the neural and chemical regulation of respiration.

19. (a) Illustrate about the mechanism of excretion.

Or

- (b) Explain the following; (i) Parturition  
(ii) Feed back regulation

20. (a) Summarises the Conduction of nerve impulses through neurons.

Or

- (b) Defend the Neuro degenerative diseases



(6 pages)

Reg. No. : .....

Code No. : 5458

Sub. Code : ZZOE 41

M.Sc. (CBCS) DEGREE EXAMINATION,  
APRIL 2023

Fourth Semester

Zoology

Elective — AQUACULTURE

(For those who joined in July 2021 onwards)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. Identify the tent related with Aquaculture
  - (a) Green revolution
  - (b) Brown revolution
  - (c) White revolution
  - (d) Blue revolution

7. Name a small pond which is used to isolate and keep the diseased fish.
  - (a) Sluice gate
  - (b) Hospital pond
  - (c) Nursery pond
  - (d) Rearing pond
8. Name of the platform area which is present between the wet space and water area.
  - (a) berm
  - (b) inlets
  - (c) outlets
  - (d) dry slope
9. Match the following with Calcium and phosphorus deficiency.
  - (a) Turner syndrome
  - (b) Soft shell syndrome
  - (c) Dwarfism
  - (d) Down syndrome
10. Match the flow of fish and money in fish marketing is \_\_\_\_\_.
  - (a) Marketing channel
  - (b) Fish farms
  - (c) Commission agents
  - (d) None

Page 3

Code No. : 5458

2. FSI stands for \_\_\_\_\_.
  - (a) India fast service
  - (b) Fishery survey of India
  - (c) Fast service
  - (d) None
3. Match the following with Pearl
  - (a) Phosphate
  - (b) Calcium
  - (c) Nacre
  - (d) Carbon
4. Select the name give to the rearing of single species in water
  - (a) Monoculture
  - (b) Polyculture
  - (c) Poly sex culture
  - (d) None of above
5. Identify the following which helps to control the pH in open system of seed fish transport.
  - (a) Banana Juice
  - (b) Grape juice
  - (c) Apple
  - (d) Lemon juice
6. Name the traditional fishing craft of Kerala
  - (a) Kattumaram
  - (b) Boats
  - (c) Gill nets
  - (d) Trawlers

Page 2

Code No. : 5458

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 250 words.

11. (a) Summarize an abiotic factors of lake necessary for fish life.

Or

(b) Interpret the scope of aquaculture.
12. (a) Discuss in detail about the Paddy cum fish culture.

Or

(b) Explain the weed culture.
13. (a) Illustrate the different methods of seed fish transport.

Or

(b) Explain the transgenic fish.
14. (a) Summarize the by products of fish and its uses.

Or

(b) Order the site selection for fish ponds.

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Code No. : 5458

[P.T.O.]



15. (a) Write the causatives, symptoms of infectious pancreatic necrosis.

Or

- (b) Write about the fungal disease and its control measures.

PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 600 words.

16. (a) Discuss an importance of aquaculture.

Or

- (b) Summarize the fishery resources in India.

17. (a) Write the different steps in Oyster culture.

Or

- (b) Explain the sewage fed fish culture.

18. (a) Explain the types of crafts.

Or

- (b) Predict the role of biotechnology in conservation of fish.

19. (a) Summarize the construction of ponds.

Or

- (b) Defend the preservation of fish.

20. (a) Write an effect of water pollution on fisheries and its control measures.

Or

- (b) Write the causative agent, symptoms and control measures of Epizootic ulcerative syndrome.

(6 pages)

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Sub. Code : ZZOM 11

M.Sc. (CBCS) DEGREE EXAMINATION, APRIL 2023

First Semester

Zoology-Core

STRUCTURE AND FUNCTION OF INVERTEBRATES

(For those who joined in July 2021 onwards)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. Organizing taxonomic information in logical classification is called ———  
(a) systematic (b) phenetic  
(c) phylogenetic (d) dendogram

6. Which of the following pigment imparts green colour to the blood?  
(a) Haemoglobin  
(b) Haemocyanin  
(c) Chlorocruorin  
(d) None of these
7. Collection of nerve cell bodies inside the CNS are called  
(a) nerves (b) ganglia  
(c) tracts (d) none of these.
8. Terminal ganglionic mass in Hirudinaria is formed by the fusion of ——— of embryonic ganglia  
(a) four (b) three  
(c) two (d) seven
9. Miracidium larva belong to which phylum  
(a) Arthropoda  
(b) Coelenterata  
(c) Mollusca  
(d) Platyhelminthes
10. Bipinnaria larva is the free-swimming larva of  
(a) Antedon (b) Star-fish  
(c) Echinus (d) Holothuria

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2. New systematic differs from classical systematic in employing———  
(a) experimental taxonomy  
(b) biochemical and cytotaxonomy  
(c) all biological parameters  
(d) numerical taxonomy
3. Simplest mode of locomotion is ——  
(a) swimming (b) creeping  
(c) floating (d) walking
4. The digestion in Sponges is  
(a) Intercellular (b) Extracellular  
(c) Intracellular (d) Holozoic
5. The subclass of Bivalvia in which gills degenerate and respiratory function is entirely taken up by the mantle  
(a) Protobranchia  
(b) Septibranchia  
(c) Filibranchia  
(d) Eulamellibranchia

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PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 250 words

11. (a) Differentiate the Acoelomates and Pseudocoelomates.  
Or  
(b) Explain the species concept.
12. (a) Describe the locomotory organelle in amoeba  
Or  
(b) Illustrate the hydrostatic movements in coelenterates.
13. (a) List out the types of lungs  
Or  
(b) Explain the excretory system in Arthropods.
14. (a) Write the cockroach nervous system.  
Or  
(b) Explain the earthworm nervous system.

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[P.T.O.]

15. (a) Illustrate the evolutionary significance of larval forms.

Or

(b) Write the distinctive characters of phylum Mesozoa.

PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 600 words

16. (a) Discuss the Binomial nomenclature.

Or

(b) Differentiate between Protostomia and Deuterostomia.

17. (a) Describe the filter feeding mechanism in Polychaeta.

Or

(b) Illustrate the feeding mechanism in echinoderms.

18. (a) Enumerate the gills in Arthropoda.

Or

(b) Elucidate about Nephridia

19. (a) Specify the nervous system of Nereis

Or

(b) Discuss the trends in neural evolution

20. (a) Illustrate the larval forms of parasites

Or

(b) Describe the salient features and affinities of Endoprocta.

\_\_\_\_\_

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M.Sc. (CBCS) DEGREE EXAMINATION, APRIL 2023

First Semester

Zoology – Core

COMPARATIVE ANATOMY OF CHORDATES

(For those who joined in July 2021 onwards)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. The term Urochordate means \_\_\_\_\_
  - (a) Notochord in head
  - (b) Notochord in tail
  - (c) Half chordate
  - (d) Possesses vertebrae
  
6. Oesophagus in adult vertebrates is derived from:
  - (a) Primitive gut
  - (b) Fore gut
  - (c) Mid gut
  - (d) Hind gut
  
7. In bony fishes operculum arises from:
  - (a) Hyomandibular
  - (b) Mandible
  - (c) Sphenethmoid
  - (d) Hyoid arch
  
8. The opening of coronary sinus is guarded by:
  - (a) Besian valve
  - (b) Mitral valve
  - (c) Semilunar valve
  - (d) Tricuspid valve
  
9. Archinephros is found in:
  - (a) Fishes
  - (b) Reptiles
  - (c) Larval cyclostomes
  - (d) Amphibians
  
10. The functional adult gonad is derived from which part of genital ridge:
  - (a) Gonal
  - (b) Pregonal
  - (c) Epigonal
  - (d) Endogonal

2. The endoskeleton of chordate animals is:
  - (a) Living structure
  - (b) Living structure without growth
  - (c) Living structure with growth
  - (d) Non-living structure
  
3. Melanocytes are located in:
  - (a) Stratum corneum
  - (b) Stratum germinativum
  - (c) Stratum lucidum
  - (d) Dermis
  
4. In birds uropygial gland is present just above the:
  - (a) Beak
  - (b) Eye
  - (c) Tail
  - (d) Ear
  
5. Cranium is a constituent of
  - (a) Dermatocranium
  - (b) Splanchocranium
  - (c) Visceral skeleton
  - (d) Neurocranium

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 250 words.

11. (a) Comment on Urochordata.  
Or  
(b) Write the general characters of Cephalochordata.
  
12. (a) Explain about the digital cornifications.  
Or  
(b) Give a brief account of Hairs.
  
13. (a) Compare vertebral column of Amphibia and Reptilia.  
Or  
(b) Give a general account on functions of endoskeleton.
  
14. (a) Compare brain of fishes and Amphibians.  
Or  
(b) Elucidate evolution of heart.



15. (a) Discuss gustatoreceptors in vertebrates.

Or

(b) Compare lateral eyes in lower vertebrates with higher vertebrates.

PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 600 words.

16. (a) Classify Chordata with suitable examples.

Or

(b) Discuss the nature of vertebrate morphology.

17. (a) Illustrate the functions of Integument.

Or

(b) Discuss about the dermal derivatives.

18. (a) Compare alimentary canal of Rana and Uromastix.

Or

(b) Compare pectoral girdles of reptiles and birds.

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19. (a) Elucidate the spinal cord in vertebrates.

Or

(b) Explain the evolution of aortic arches in vertebrates.

20. (a) Compare lateral line system in Scoliodon and Teleosts.

Or

(b) Give an account of Electroreception.

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M.Sc. (CBCS) DEGREE EXAMINATION, APRIL 2023.

First Semester

Zoology – Core

ENVIRONMENTAL BIOLOGY

(For those who joined in July 2021 onwards)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer.

1. The environmental protection act was promulgated in the year  
(a) 1974 (b) 1961  
(c) 1986 (d) 1972
2. If two species use the same resources then they are said to compete and their interaction is known as  
(a) Composition (b) Genera  
(c) Transformation (d) Competition

7. The energy flow in an ecosystem can be depicted in the form of a  
(a) Food pyramid  
(b) Energy pyramid  
(c) Biomass pyramid  
(d) Both (a) and (b)
8. Which is the renewable energy in the following  
(a) Petroleum (b) Natural gas  
(c) Solar energy (d) Coal
9. The first national park in India is  
(a) Satpura National Park  
(b) Panna National Park  
(c) Kaziranga National Park  
(d) Jim Corbett National Park
10. Tamilnadu pollution control board was established in the year  
(a) 1975 (b) 1980  
(c) 1982 (d) 1970

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3. Distribution of individuals within a population  
(a) Dispersal  
(b) Dispersion  
(c) Regulation of population  
(d) Population fluctuations
4. Symbiosis is an animal association, where  
(a) One partner is benefited  
(b) No partner is harmed  
(c) Both partners are harmed  
(d) Both partners are benefited
5. In Ecological succession the final stable community is known as,  
(a) Final community  
(b) Climax community  
(c) Ultimate community  
(d) Seral community
6. The species that are responsible for making characteristics of the community are called  
(a) Recessive species  
(b) Dominant species  
(c) Special species  
(d) High performer species

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PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 250 words.

11. (a) Light is an important Ecological external factor of organisms – Discuss.  
Or  
(b) Describe the concept of character displacement.
12. (a) Trace the evolution of life history strategies.  
Or  
(b) Give an account on population growth curves.
13. (a) Explain the concept of climax.  
Or  
(b) Describe the types of stratifications in community.
14. (a) Write a brief account on physico-chemical aspects of marine ecosystem.  
Or  
(b) Briefly discuss about Biome system.

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[P.T.O.]

15. (a) Give an account on 'Project Tiger'.

Or

(b) Briefly discuss Biodiversity 'Hot Spot'.

PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 600 words.

16. (a) Write an account on the interaction of biotic and abiotic components.

Or

(b) Describe the ecological niche and habitat.

17. (a) Distinguish between intraspecific and interspecific competition.

Or

(b) Give an account on population regulation.

18. (a) What is ecological succession? Describe its types and general process.

Or

(b) Define community and describe its structure stratification and components.

19. (a) Describe the biogeographic zones in India and also zoogeographical realms.

Or

(b) Briefly explain the concept of energy flow in an ecosystem.

20. (a) Explain sources, effects and control measures of air pollution.

Or

(b) What is biodiversity? Explain the reason for the loss of biodiversity.

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M.Sc. (CBCS) DEGREE EXAMINATION, APRIL 2023

First Semester

Zoology – Core

BIOCHEMISTRY

(For those who joined in July 2021 onwards)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions

Choose the correct answer :

- Which among the following is not a property of Ionic bond?
  - Losing of electrons
  - Gain of electrons
  - Sharing of electrons
  - Transfer of electrons

- A solution having a pH of 6 has a proton concentration of \_\_\_\_\_
  - $10^{-6}$  M
  - $10^6$  M
  - 6 M
  - 0.6 M
- The number of isomers of glucose is
  - 2
  - 4
  - 8
  - 16
- The carbon atom which becomes asymmetric when the straight chain form of monosaccharide changes into ring form is known as
  - Anomeric carbon atom
  - Epimeric carbon atom
  - Isomeric carbon atom
  - None of these
- Primary structure of a protein is formed by
  - Hydrogen bond
  - Peptide bond
  - Disulphide bond
  - All of these

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- The bond in proteins that is not hydrolysed under usual conditions of denaturation.
  - Hydrophobic bond
  - Hydrogen bond
  - Disulphide bond
  - Peptide bond
- Sphingomyelins :
  - Phospholipids
  - Nitrolipids
  - Alcohols
  - None of these
- Fatty acids are oxidized by
  - $\alpha$  - oxidation
  - $\beta$  - oxidation
  - $\omega$  - oxidation
  - All of these
- One manifestation of vitamin A deficiency is
  - Painful joints
  - Night blindness
  - Loss of hair
  - Thickening of long bones

- The enzyme aspartate transcarbamoylase of pyrimidine biosynthesis is inhibited by
  - ATP
  - ADP
  - AMP
  - CTP

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b)  
Each answer should not exceed 250 words.

- (a) Explain the vander waals forces.  
Or  
(b) Write the properties of buffer.
- (a) Explain steps involved in gluconeogenesis.  
Or  
(b) Elucidate the structure of disaccharides.
- (a) Comment on Ramachandran plot.  
Or  
(b) Explain the secondary structure of protein.
- (a) Elucidate the Beta oxidation of fatty acids.  
Or  
(b) Discuss the metabolic disorder-atherosclerosis.

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[P.T.O.]

15. (a) Explain the biochemical functions of vitamin C.

Or

(b) Discuss Lesch-Nyhan syndrome.

PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b)  
Each answer should not exceed 600 words.

16. (a) Describe the biological importance of buffers.

Or

(b) Describe the electrolytic dissociation.

17. (a) Specify the TCA cycle.

Or

(b) Illustrate the metabolic disorder-Diabetes and their biomedical significance.

18. (a) Classify Proteins with suitable examples.

Or

(b) Specify isoenzymes.

19. (a) Discuss the metabolic disorder-Hyperlipoproteinemia.

Or

(b) Explain about ketogenesis.

20. (a) Elucidate the structure of Riboflavin and its deficiency.

Or

(b) Discuss the biosynthesis of purines.

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(6 pages)

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M.Sc. (CBCS) DEGREE EXAMINATION, APRIL 2023.

Second Semester

Zoology – Core

CELL AND MOLECULAR BIOLOGY

(For those who joined in July 2021 onwards)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

- Who discovered and coined the term "cell"  
(a) Robert Boyle (b) Robert Hooke  
(c) Robert Brown (d) Robert Gallo
- The functions on the nuclear pores is  
(a) Regulate movement of molecules between the nucleus and cytoplasm  
(b) Package DNA into chromosomes  
(c) Synthesize ribosomes  
(d) Synthesize RNA

- The Fluid Mosaic Model was proposed by  
(a) James Watson  
(b) Francis Crick  
(c) S.J. Singer and Garth Nicolson  
(d) Rosalind Franklin
- Which of the following is required for active transport to occur?  
(a) A concentration gradient  
(b) A lipid bilayer membrane  
(c) A high temperature  
(d) ATP
- Molecules that transmit information with in and between cells is called  
(a) Signal molecules  
(b) Messenger  
(c) Transmitters  
(d) Receptors
- Oncogenesis means  
(a) A process that leads to the formation of new organs  
(b) A process that leads to the death of cells  
(c) A process that leads to the transformation of normal cells cancer cells  
(d) A process that leads to the formation of new blood vessels

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- The purpose of the Griffith experiment is  
(a) To study about genetic material of bacteria  
(b) To study the transformation in bacteria  
(c) To study the effect of antibiotics on bacteria  
(d) To study the metabolism of bacteria
- \_\_\_\_\_ is the name of the process by which DNA makes a copy of itself?  
(a) Replication (b) Transcription  
(c) Translation (d) Transformation
- \_\_\_\_\_ is a mechanism for regulating gene expression at the transcriptional level  
(a) Alternative splicing  
(b) miRNA interference  
(c) DNA methylation  
(d) RNA editing
- Conjugation is a process of DNA transfer in bacteria that requires  
(a) Physical contact between two bacterial cells  
(b) Secretion of DNA into the extracellular environment  
(c) Transfer of DNA through bacteriophages  
(d) Random diffusion of DNA into recipient cells

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PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 250 words

- (a) Describe about animal cell with suitable diagram.  
Or  
(b) Quote the nucleus structure with suitable diagram.
- (a) Distinguish about properties of plasma membrane.  
Or  
(b) Explain about Giant chromosomes.
- (a) Write about cell signaling.  
Or  
(b) Compute on cell ageing.
- (a) Explain the Hershey-Chase experiment that helped establish DNA as the genetic material.  
Or  
(b) Explain the types and functions of plasmids in bacteria.

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[P.T.O.]



15. (a) Justify the transcription of mRNA in prokaryotes.

Or

(b) Write about transformation.

PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 600 words.

16. (a) Enumerate about cell theory.

Or

(b) Describe about mitochondria and Golgi complex

17. (a) Summarize about Fluid mosaic model of plasma membrane with appropriate diagram.

Or

(b) Illustrate about sodium potassium pump

18. (a) Explain about cell communication and intracellular signaling.

Or

(b) Determine about oncogenesis.

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19. (a) Evaluate about structure of DNA.

Or

(b) Explain about DNA replication and its types.

20. (a) Summarize regulation of gene expression.

Or

(b) Write about conjugation and transduction.

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Sub. Code : ZZOM 22

M.Sc. (CBCS) DEGREE EXAMINATION, APRIL 2023

Second Semester

Zoology-Core

DEVELOPMENTAL BIOLOGY

(For those who joined in July 2021 onwards)

Time : Three hours Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. Totipotency means
  - (a) The ability of a single cell to differentiate into multiple cell types
  - (b) The ability of a single cell to divide and produce all of the differentiated cells in an organism
  - (c) The ability of a single cell to regenerate lost tissues
  - (d) The ability of a single cell to undergo apoptosis
  
6. Which hormone is responsible for the molting process in insects
  - (a) Insulin
  - (b) Ecdysone
  - (c) Thyroxine
  - (d) Adrenaline
7. Which animals are able to regenerate entire body parts
  - (a) Mammals
  - (b) Fish
  - (c) Reptiles
  - (d) Starfish
8. What is a gradient?
  - (a) The uniform distribution of a signaling molecule
  - (b) The gradual change of a property over a spatial or temporal scale
  - (c) The sudden change of a property over a spatial or temporal scale
  - (d) The inability of a signaling molecule to diffuse through a tissue
9. Which of the following is a chromosomal disorder?
  - (a) Cystic fibrosis
  - (b) Down syndrome
  - (c) Sickle cell anemia
  - (d) Hemophilia

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2. Which of the following is a type of genetic mutation?
  - (a) Deletion
  - (b) Inversion
  - (c) Duplication
  - (d) All of the above
3. What is the first stage of cleavage?
  - (a) Morula
  - (b) Blastula
  - (c) Gastrula
  - (d) Zygote
4. Bilateral symmetry is
  - (a) The arrangement of body parts around a central point
  - (b) The asymmetrical shape of an organism's body
  - (c) The division of the body into identical halves
  - (d) The ability of an organism to move in all directions
5. What determines the sex of an individual in humans
  - (a) The combination of sex chromosomes inherited from the parents
  - (b) The number of X chromosomes inherited from the mother
  - (c) The presence of testosterone in the embryo
  - (d) The size of the genitalia at birth

Page 2

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10. What is azoospermia?
  - (a) A condition in which a man produces no sperm
  - (b) A condition in which a man produces too few sperm
  - (c) A condition in which a man produces abnormally shaped sperm
  - (d) A condition in which a man produces dead sperm

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 250 words

11. (a) Visualize about commitment.  
Or  
(b) Define genomic equivalence.
12. (a) Explain sperm-egg recognition in animals.  
Or  
(b) Discuss about formation of symmetry during embryogenesis.

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[P.T.O.]

13. (a) Explain cell aggregation and differentiation in *Dictyostelium*.

Or

(b) Report the sex determination in animals

14. (a) Explain about regeneration phenomenon in animals.

Or

(b) Evaluate about stimulation and suppression.

15. (a) Conclude-Assisted Reproductive Technology (ART).

Or

(b) Write about Gamete intrafallopian transfer (GIFT)

PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 600 words

16. (a) Define-Induction and competence

Or

(b) Describe Genomic imprinting.

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17. (a) Explain about Spermatogenesis.

Or

(b) Illustrate about formation of germ layers in animals.

18. (a) Write about axes and pattern formation in Chick.

Or

(b) Illustrate about metamorphosis during larval formation.

19. (a) Illustrate about significance of neoteny.

Or

(b) Explain about polarity and gradients.

20. (a) Illustrate about superovulation.

Or

(b) Write about genetic disorders.

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M.Sc. (CBCS) DEGREE EXAMINATION, APRIL 2023.

Second Semester

Zoology — Core

GENETICS

(For those who joined in July 2021 onwards)

Time : Three hours Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. Dihybrid cross between two heterozygous individuals, what is the phenotypic ratio of the off spring?  
(a) 1 : 1 (b) 3 : 1  
(c) 1 : 2 : 1 (d) 9 : 3 : 3 : 1
2. Pleiotropy means  
(a) A phenomenon where multiple genes influence a single trait  
(b) A phenomenon where a single gene influences multiple traits  
(c) A phenomenon where genes are linked on the same chromosome  
(d) A phenomenon where genes are unlinked on different chromosomes

6. What is the effect of a deletion mutation on a gene?  
(a) It usually has no effect  
(b) It may cause the gene to produce a non-functional protein  
(c) It may cause the gene to produce a protein with altered function  
(d) It may cause the gene to produce a more efficient protein
7. Which of the following is not a factor that can affect genotype frequencies in a population?  
(a) Mutation (b) Migration  
(c) Genetic drift (d) Natural selection
8. Migration in population genetics is  
(a) The movement of individuals into or out of a population  
(b) The frequency of a particular allele in a population  
(c) The evolution of new species from existing ones  
(d) The process of natural selection

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3. Purpose of a two-point test cross is  
(a) to determine the genotype of an individual  
(b) to determine the linkage between two genes on the same chromosome  
(c) to determine the location of genes on different chromosomes  
(d) to determine the number of genes in a population
4. Which chromosome is responsible for X-linked inheritance?  
(a) Chromosome 1 (b) Chromosome 20  
(c) X chromosome (d) Y chromosome
5. Which of the following promotes gene expression in euchromatin?  
(a) Histone acetylation  
(b) DNA methylation  
(c) Histone methylation  
(d) Histone deacetylation

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9. Sickle cell anemia is caused by a mutation in \_\_\_\_\_  
(a) Hemoglobin A gene  
(b) Hemoglobin B gene  
(c) Hemoglobin C gene  
(d) Hemoglobin S gene
10. Alkaptonuria is caused by a deficiency of  
(a) Homogentisate oxidase  
(b) Tyrosine hydroxylase  
(c) Phenylalanine hydroxylase  
(d) Histidine decarboxylase

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 250 words.

11. (a) Define law of independent assortment.  
Or  
(b) Describe polygenetic inheritance.
12. (a) Explain about two point test cross.  
Or  
(b) Describe Y linkage with hair pinna in males.

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[P.T.O.]

13. (a) Articulate about Euploidy and Aneuploidy.

Or

(b) Explain genetic aberrations with deletion.

14. (a) Conclude – Fisher's theorem.

Or

(b) Explain about migration.

15. (a) Evaluate about Sickle cell anaemia.

Or

(b) Justify – reverse mutation.

PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 600 words.

16. (a) Enumerate dihybrid cross with law of independent assortment.

Or

(b) Define multiple allelic inheritance.

17. (a) Illustrate three point test cross in drosophila.

Or

(b) Discuss X linked inheritance with hemophilia.

18. (a) Explain about non disjunction failure in during cell division.

Or

(b) Articulate about karyo type concepts of Eugeneics and Euthenics.

19. (a) Explain about Inbreeding depression in a gene population.

Or

(b) Define – Inbreeding depression.

20. (a) Summarize about frameshift mutation.

Or

(b) Evaluate the inborn errors of metabolism that cause albinism.



(7 pages)

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Sub. Code : ZZOM 24

M.Sc. (CBCS) DEGREE EXAMINATION, APRIL 2023.

Second Semester

Zoology – Core

EVOLUTION

(For those who joined in July 2021 onwards)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. According to Lamarckism, how are the changes acquired by an organism passed on to its offspring?
  - (a) Through genetic inheritance
  - (b) Through random mutations
  - (c) Through natural selection
  - (d) Through environmental factors

2. What played a significant role in human evolution besides natural selection, genetic drift and genetic mutation?
  - (a) Random chance
  - (b) The development of culture and technology
  - (c) Cosmic radiation
  - (d) Environmental disasters
3. What is neutral evolution?
  - (a) Changes in DNA sequences that confer an advantage to the organism and increase its fitness
  - (b) Changes in DNA sequences that do not affect the function of the protein encoded by the gene
  - (c) Random changes in the frequency of DNA sequences in a population over time.
  - (d) Studying the effects of climate change on biodiversity.
4. Macroevolution denotes
  - (a) The study of how mutations occur in the phenotype of organisms over time
  - (b) The study of how changes occur in the DNA sequences of genes and genomes over time
  - (c) The study of how new species and higher taxonomic groups arise from pre-existing ones.
  - (d) The study of how microorganisms evolve over time.

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5. The node of a phylogenetic tree is \_\_\_\_\_
  - (a) A branch point representing a common ancestor of two or more lineages
  - (b) A leaf representing a modern species or taxon
  - (c) A symbol used to denote a fossil species
  - (d) A term used to describe the process of evolution within a single lineage.
6. Western blot technique is \_\_\_\_\_
  - (a) An immunological technique used to detect the presence of specific proteins in a sample
  - (b) A technique used to purify proteins from a mixture
  - (c) A technique used to amplify DNA fragments
  - (d) A technique used to identify specific genetic mutations.
7. In DNA, which nitrogenous base pairs with adenine is
  - (a) Guanine
  - (b) Cytosine
  - (c) Uracil
  - (d) Thymine
8. How do restriction enzymes cut DNA?
  - (a) They cleave the hydrogen bonds between base pairs in the DNA.
  - (b) They introduce nicks in the DNA
  - (c) They break the sugar-phosphate backbone of the DNA
  - (d) They introduce mutations in the DNA

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9. What is the role of gene flow in population genetics?
  - (a) It can lead to the fixation of alleles in a population
  - (b) It increases genetic diversity within populations.
  - (c) It prevents speciation from occurring
  - (d) It reduces genetic differentiation between populations
10. In vitro means
  - (a) A scientific experiment performed inside the body in a clinical setting.
  - (b) A scientific experiment performed on animals in a controlled environment
  - (c) A scientific experiment performed on plants in a greenhouse
  - (d) A scientific experiment performed outside of the body in a laboratory setting

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).  
Each answer should not exceed 250 words.

11. (a) Quote the evolutionary theories of Darwin.  
Or  
(b) Visualize the role of Altruism in behavioral evolution.

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12. (a) Explain the role of gene in evolution.  
Or  
(b) Review on micro evolution.
13. (a) Explain about molecular phylogenetics and how it contributed to understanding of genetics and evolution?  
Or  
(b) Explain the Concept of distance methods in molecular phylogenetics and provide an example of how it can be used to reconstruct evolutionary relationships.
14. (a) Explain about nucleic acid sequence and how does it contribute to genetic information.  
Or  
(b) Conclude about restriction enzyme studies.
15. (a) Create a relationship to metapopulations in evolution.  
Or  
(b) Write about conservation methods of genetic resources.

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19. (a) Explain about the amino acid sequence analysis help in inferring phylogenetic relationships between organisms.  
Or  
(b) Illustrate about DNA hybridization techniques.
20. (a) Summarize about monitoring of natural populations.  
Or  
(b) Estimate about Loss of Genetic variations.
- 

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PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b)  
Each answer should not exceed 600 words.

16. (a) Define the evolutionary theories of Lamarck.  
Or  
(b) What are the key events and milestones in the evolution of the human lineage?
17. (a) Describe the process of Molecular evolution and its significance in the field of biology.  
Or  
(b) Explain some of the major trends observed in higher categories of organisms during their evolutionary history.
18. (a) Construct the method of Phylogenetic tree Which relates to evolution.  
Or  
(b) Illustrate about maximum likelihood method is used for phylogenetics.

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Code No. : 5456

Sub. Code : ZZOM 42

M.Sc. (CBCS) DEGREE EXAMINATION,  
APRIL 2023

Fourth Semester

Zoology – Core

IMMUNOLOGY

(For those who joined in July 2021 onwards)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. Name the other name for Natural immunity.

- (a) Active
- (b) innate immunity
- (c) acquired immunity
- (d) None

6. Name an auto immune disease \_\_\_\_\_

- (a) Thyrotoxicosis
- (b) additions disease
- (c) Thrombocytopenia
- (d) all the above

7. Locate the place of maturation of T cells after migration from bone marrow,

- (a) thymus
- (b) lymph node
- (c) lymph
- (d) MALT

8. Tolerance is induced by the production of \_\_\_\_\_

- (a) mutation
- (b) T suppressor cells
- (c) clonal deletion
- (d) all the above

9. Name the HIV genome consists of two identical single-stranded

- (a) DNA molecules
- (b) DNA-RNA
- (c) RNA molecules
- (d) zDNA

2. Tell the immunoglobulin which crosses the human placenta is

- (a) Ig A
- (b) Ig I
- (c) Ig G
- (d) Ig M

3. Recognize the lymphocytes and platelets which contains

- (a) class I MHC
- (b) class II MHC
- (c) class III MHC
- (d) class IV MHC

4. Tell the name of the implanted tissues

- (a) grafts
- (b) donor
- (c) recipient
- (d) none of them

5. Select the T-cell receptor is a protein complex found on the surface of

- (a) B lymphocytes
- (b) T lymphocytes
- (c) plasmocytes
- (d) cytocytes

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6. Name an auto immune disease \_\_\_\_\_

- (a) Thyrotoxicosis
- (b) additions disease
- (c) Thrombocytopenia
- (d) all the above

7. Locate the place of maturation of T cells after migration from bone marrow,

- (a) thymus
- (b) lymph node
- (c) lymph
- (d) MALT

8. Tolerance is induced by the production of \_\_\_\_\_

- (a) mutation
- (b) T suppressor cells
- (c) clonal deletion
- (d) all the above

9. Name the HIV genome consists of two identical single-stranded

- (a) DNA molecules
- (b) DNA-RNA
- (c) RNA molecules
- (d) zDNA

10. Select the graft that takes place within the same individual is \_\_\_\_\_

- (a) Autograft
- (b) allograft
- (c) xenograft
- (d) all the above

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 250 words.

11. (a) Summarize Structure and functions of IgM.

Or

(b) Explain the detection of molecules using Western blot techniques.

12. (a) Predict the applications of mono clonal antibodies.

Or

(b) Write a note on Radio immune assay.

13. (a) Order the T cell receptor complex.

Or

(b) Order the functions of cytokines.

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14. (a) Assess the complement deficiencies.

Or

(b) Grade the consequences of complement activation.

15. (a) Write a note on immune response for tumour.

Or

(b) Write short note on Viral infections.

PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 600 words.

16. (a) Explain the steps involved in recombinant DNA technology.

Or

(b) Illustrate the Primary lymphoid organ.

17. (a) Interpret the functions of major compatibility complex

Or

(b) Write about ELISA and its application.

18. (a) Order the role of cytokines in the inflammatory responses.

Or

(b) Explain the steps involved in B- cell activation.

19. (a) Analyze the various types of tolerance.

Or

(b) Discuss the autoimmune diseases in Man.

20. (a) Write an essay on clinical manifestation of graft rejection.

Or

(b) Compile the Cancer immunotherapy.

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(6 pages)

Reg. No. : \_\_\_\_\_

Code No. : 5457

Sub. Code : ZZOM 43

M.Sc. (CRCS) DEGREE EXAMINATION,  
APRIL 2023.

Fourth Semester

Zoology - Core

ENTOMOLOGY

(For those who joined in July 2021 onwards)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL the questions.

Choose the correct answer :

1. Identify the order in which beetles and weevils are included
  - (a) hymenoptera
  - (b) isoptera
  - (c) coleoptera
  - (d) diptera

7. Identify the pest of Paddy
  - (a) *Bombyx sp*
  - (b) *Megascolex*
  - (c) *Oryctes rhinoceros*
  - (d) *Chilo*
8. Tell the common name of *Leptocorisa varicornis*.
  - (a) rice bug
  - (b) cotton weevil
  - (c) cotton bug
  - (d) coconut beetle
9. Identify the following which controls the mosquito larva
  - (a) *Gambusia*
  - (b) Lady beetles
  - (c) Prawm
  - (d) Salmon
10. Identify an example of semiochemicals.
  - (a) Hormones
  - (b) Ecdyzone
  - (c) Insect pheromones
  - (d) FSH

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2. Match the following with the preservation of Pinned insects
  - (a) steaming
  - (b) dehydration
  - (c) sun drying
  - (d) heating
3. Match the insects which have chewing and lapping type of mouthparts
  - (a) bees and wasps
  - (b) mosquito
  - (c) ants
  - (d) cockroach
4. Which of the following exhibit the partial metamorphosis?
  - (a) wasp
  - (b) ant
  - (c) dragonfly
  - (d) all the above
5. Identify the following where the hemocytes are present
  - (a) lymph
  - (b) hemolymph
  - (c) spiracles
  - (d) stigmata
6. Identify the which Inorganic salts mostly present in the hemolymph of Insects
  - (a) sodium
  - (b) chlorine
  - (c) potassium
  - (d) all the above

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PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 250 words.

11. (a) Explain the characteristics of order Hymenoptera.

Or

(b) Interpret the killing insects.
12. (a) Illustrate the segmentation in an abdomen.

Or

(b) Explain the hypermetabolous development in insect.
13. (a) Explain the functions of integuments in insects.

Or

(b) Write a note on hemolymph.
14. (a) Evaluate the damage caused by sugar cane leaf borer.

Or

(b) Predict the damages caused by *Oryctes rhinoceros*.

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15. (a) Write a note on pest control through cultural method.

Or

- (b) Write short note on Sterile insect technique.

PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 600 words.

16. (a) Discuss the various method of collection and preservation of insects.

Or

- (b) Explain the following :

(i) Hemiptera

(ii) Isoptera.

17. (a) Illustrate the various type of mouthparts.

Or

- (b) Explain the life cycle of Insects.

18. (a) Order the types and functions of hemocytes.

Or

- (b) Illustrate the structure of female reproductive system of insects.

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19. (a) Predict the damages caused by *Chilo infuscatellus*.

Or

- (b) Summarize the beneficial insects.

20. (a) Design the applications of integrated pest management.

Or

- (b) Prepare an essay on the pest control through Organic compounds.

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