

(6 pages)

Reg. No. :

Code No. : 6086

Sub. Code : PZOM 33

M.Sc. (CBCS) DEGREE EXAMINATION,
NOVEMBER 2022.

Third Semester

Zoology — Core

BIostatistics AND BIOinformatics

(For those who joined in July 2017-2020)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. Statistical enquiry means
 - (a) It is science for knowledge
 - (b) Search for knowledge
 - (c) Collection of anything
 - (d) Search for knowledge with the help of statistical method

2. Cluster sampling means
 - (a) Sample is divided into number of sub-groups
 - (b) Sample are collected at regular interval
 - (c) Sample is obtained by conscious selection
 - (d) Universe is divided into groups

3. Following are the partition values except
 - (a) Deciles (b) Quartiles
 - (c) Mode (d) Percentile

4. Measures of central tendency are
 - (a) Inferential statistics that identify the best single value for representing a set of data
 - (b) Descriptive statistics that identify the spread of the scores in a data set
 - (c) Inferential statistics that identify the spread of the scores in a data set
 - (d) Descriptive statistics that identify the best single value for representing a set of data

5. What is the probability of getting an even number when a dice is thrown?
 - (a) $1/6$ (b) $1/2$
 - (c) $1/3$ (d) $1/4$

6. The probability of getting two tails when two coins are tossed is
- (a) $1/6$ (b) $1/2$
(c) $1/3$ (d) $1/4$
7. Which Chi Square distribution looks the most like a normal distribution?
- (a) A Chi Square distribution with 4 degrees of freedom
(b) A Chi Square distribution with 5 degrees of freedom
(c) A Chi Square distribution with 6 degrees of freedom
(d) A Chi Square distribution with 16 degrees of freedom
8. Consider a set of 18 samples from a standard normal distribution. We square each sample and sum all the squares. The number of degrees of freedom for a Chi Square distribution will be?
- (a) 17 (b) 18
(c) 19 (d) 20
9. Submission to Genbank are made using
- (a) Banklt and Sequin (b) Banklt and Bankln
(c) Sequin and Bankln (d) Entrez

10. Which of the following is a Protein sequence database?
- (a) DDBJ (b) EMBL
(c) GenBank (d) PIR

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 characteristic of classification of data.

Or

- (b) Write the general rule for construction of table.

12. (a) Enumerate the properties of symmetrical, positively and negatively skewed distributions.

Or

- (b) What is kurtosis of a distribution? How would you measure it?

13. (a) Write the properties of binomial distribution.

Or

- (b) Write the properties of Poisson distribution.

14. (a) Write the disadvantages of Latin square design.

Or

- (b) Mention the Randomized Block Design.

15. (a) Define Biological Databases.

Or

- (b) Given an account on GenBank.

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 types of Classification of data.

Or

- (b) Explain the types of tables.

17. (a) Describe the construction and uses of a stem and leaf diagram.

Or

- (b) Describe the construction and uses of a box plot.

18. (a) Write a detailed account on types of probability.

Or

(b) List out the properties of normal curve.

19. (a) Describe the carrying out of Mann-Whitney U test.

Or

(b) When Should Yates' Correction Be used?

20. (a) Write an elaborate account of Database of protein sequences.

Or

(b) Explain the following :

(i) NCBI protein database

(ii) UniProt.

(6 pages)

Reg. No. :

Code No. : 6088

Sub. Code : PZOM 41

M.Sc.(CBCS) DEGREE EXAMINATION,
NOVEMBER 2022.

Fourth Semester

Zoology - Core

IMMUNOLOGY

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

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. Humoral immunity is mediated by
 - (a) T cells
 - (b) Antibodies
 - (c) Macrophages
 - (d) Null cells

2. _____ is the secondary lymphoid organ present in the abdominal cavity.
 - (a) Spleen
 - (b) Thymus
 - (c) Both (a) and (b)
 - (d) Bone marrow

3. The antibody which is present in body secretion is
- (a) IgM
 - (b) IgA
 - (c) IgG
 - (d) IgE
4. Delayed hypersensitivity as typified by the Mantoux reaction to tuberculin is mediated by
- (a) Lymphocytes
 - (b) Polymorpho nuclear cells
 - (c) Anaphylactic antibodies
 - (d) Complement binding antibodies
5. During B cell maturation which of the following stage expresses surrogate light chain complexed with the heavy chain?
- (a) Pro B cell
 - (b) Pre B cell
 - (c) Immature B cell
 - (d) Mature B cell
6. Exogenous antigen are processed in the
- (a) Endocytic pathway
 - (b) Cytosolic pathway
 - (c) Both (a) and (b)
 - (d) Exocytic pathway

7. SCID can occur due to the absence of an enzyme
- (a) Adenosine deaminase
 - (b) Guanosine deaminase
 - (c) Phosphorylase
 - (d) Thymidine deaminase
8. Most autoimmune diseases are caused by a
- (a) Sequestered antigens
 - (b) Neoantigens
 - (c) Both (a) and (b)
 - (d) Immature Bcells
9. Graft versus host disease is associated with
- (a) Kidney transplantation
 - (b) Bone marrow transplantation
 - (c) Corneal transplantation
 - (d) Skin grafting
10. The major molecules responsible for rejection of transplant is
- (a) B cells
 - (b) T cells
 - (c) MHC molecule
 - (d) Antibodies

PART B — (5 × 5 = 25 marks)

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

Each answer should not exceed 250 words.

11. (a) Discuss the importance of attenuated vaccines.

Or

- (b) Describe the structure and function of the thymus.

12. (a) Give an account on types of antigens.

Or

- (b) Enlist the role of histocompatibility complex in immune system.

13. (a) Give an account on thymic selection of T cell repertoire.

Or

- (b) Describe endocytic pathway of exogenous antigen presentation.

14. (a) Enlist the characteristics of autoimmune system.

Or

- (b) Comment on the immune response against protozoan and helminthine parasites.

15. (a) What are vaccines? Briefly detail its types.

Or

(b) Comment on interferons.

PART C — (5 × 8 = 40 marks)

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

Each answer should not exceed 600 words.

16. (a) Differentiate active acquired immunity from passive acquired immunity.

Or

(b) Write an essay on secondary lymphoid organs.

17. (a) Explain the activation of complement system through classical pathway and mention its biological functions.

Or

(b) Describe the antigen-antibody interactions.

18. (a) Enlist the steps involved in the activation of B cells

Or

(b) Write an essay on immunological memory.

19. (a) Write briefly on any three primary immune deficiency diseases.

Or

(b) Give an account on immune responses against viral and bacterial infection.

20. (a) Comment on allograft rejection.

Or

(b) Recombinant vectors as vaccines- Justify.

(6 pages)

Reg. No. :

Code No. : 6089

Sub. Code : PZOM 42

M.Sc. (CBCS) DEGREE EXAMINATION,
NOVEMBER 2022

Fourth Semester

Zoology – Core

GENETICS

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

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. Alleles are
 - (a) Alternative forms of genes
 - (b) Homologous chromosomes
 - (c) Linked genes
 - (d) Chromosomes that are crossed over

2. When linkage characters on genes are inherited together through two or more generations is called
- (a) Continuous linkage
 - (b) Complete linkage
 - (c) Incomplete linkage
 - (d) Consistent linkage
3. The smallest unit of DNA capable of undergoing recombination during crossing over is called as
- (a) Cistron
 - (b) Codon
 - (c) Muton
 - (d) Recon
4. Turner's syndrome is depicted by
- (a) XO
 - (b) XY
 - (c) XXY
 - (d) XXX
5. _____ cause mutation in micro-organisms.
- (a) X rays
 - (b) β -rays
 - (c) UV-rays
 - (d) γ rays
6. A plasmid is
- (a) Genetic material of a virus
 - (b) Extrachromosomal DNA in a bacterial cell
 - (c) Starch granule
 - (d) Fat granule

7. _____ refers to the combination of all the genes present in a reproducing population or species.
- (a) Gene pool
 - (b) Mendalian population
 - (c) Polymorphism
 - (d) Evolution
8. In Hardy-Weinberg law _____ represents the next generation expected to be homozygous.
- (a) q^2
 - (b) $2pq^2$
 - (c) $2pq$
 - (d) p^2
9. _____ is a test to identify genetic abnormality of a faetus.
- (a) Aminocentesis
 - (b) Pedigree analysis
 - (c) RTPCR
 - (d) Blood analysis
10. Chromosomal aberrations in human being is known as
- (a) Eugenics
 - (b) Euthenics
 - (c) Syndrome
 - (d) Euphenics

PART B — (5 × 5 = 25 marks)

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

Each answer should not exceed 250 words.

11. (a) Quote on Mendel's monohybrid experiment.

Or

- (b) Record about linkage with an example.

12. (a) Distinguish about mutation.

Or

- (b) Explain-Klinefelter's syndrome.

13. (a) Explain about chemical mutagens on nucleotide sequence.

Or

- (b) Conclude about gene inheritance in shell coiling of snail

14. (a) Explain about mendalian population.

Or

- (b) Justify - sex linked genes.

15. (a) Evaluate about Aminocentesis.

Or

(b) Write about genetic counseling.

PART C — (5 × 8 = 40 marks)

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

Each answer should not exceed 600 words.

16. (a) Describe about penetrance and expressive phenocopies.

Or

(b) Define-CIB techniques

17. (a) Distinguish about gene regulation in protein synthesis.

Or

(b) Illustrate about IS elements

18. (a) Illustrate about extra chromosomal inheritance with suitable example.

Or

(b) Write about Inbreeding.

19. (a) Illustrate about applications of Hardy Weinberg law in calculating frequencies of a population.

Or

- (b) Evaluate about factors affecting Hardy Weinberg equilibrium

20. (a) Evaluate about twins.

Or

- (b) Summarize about DNA finger printing.
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(6 pages)

Reg. No. :

Code No. : 6090

Sub. Code : PZOM 43

M.Sc. (CBCS) DEGREE EXAMINATION,
NOVEMBER 2022.

Fourth Semester

Zoology — Core

AQUACULTURE

(For those who joined in July 2017-2020)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. The potential of marine fish production from the Indian EEZ is
 - (a) 3.9 million tonnes
 - (b) 3.0 million tonnes
 - (c) 5.4 million tonnes
 - (d) 4.5 million tonnes

2. The following state has the highest marine fish production in India.
(a) Maharashtra (b) Gujarat
(c) Kerala (d) Tamil Nadu
3. Which of the following is not an edible freshwater fish?
(a) Anguilla (b) Lebeo rohita
(c) Mystus singhala (d) Wallago attu
4. Which of the following is not the economic importance of fisher?
(a) Source of food
(b) Source of water
(c) Good source of vitamins
(d) Polishing agent
5. The number of cephalic appendages in prawn is
(a) Four pairs (b) Five pairs
(c) Six pairs (d) Eight pairs
6. Name a partial stem parasite weed.
(a) Loranthus (b) Cuscuta
(c) Orobanche (d) Striga

7. Transgenic fish lines are created by _____ of DNA into the genome.
- (a) Excision (b) Partial attachment
(c) Inactivation (d) Integration
8. The maximum times for filling a pond is
- (a) 1 week (b) 3 weeks
(c) 2 weeks (d) 4 weeks
9. Which one of the following bacteria is associated with fish and shellfish?
- (a) Bacillus cereus
(b) Campylobacter
(c) Salmonella
(d) Vibrio parahaemolyticus
10. Which one of the following is an economically important marine fish?
- (a) Rohu (b) Catla
(c) Hilsa (d) Cyprinus

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 scope and importance of Aquaculture.

Or

- (b) Briefly narrate the problems of Lake Fishery.

12. (a) Enumerate the various fish culture system practices in India.

Or

- (b) Briefly narrate the frog culture.

13. (a) Enumerate the different types of crafts and gears used for fish catching.

Or

- (b) Write a short note on eradication method of weeds in fish farm.

14. (a) What are the ideal soil characters for the construction of fish pond?

Or

- (b) Give an account on fresh water aquarium.

15. (a) What is water pollution and its effects on fisheries?

Or

- (b) Explain the Protozoan diseases affecting the fishes.

PART C — (5 × 8 = 40 marks)

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

Each answer should not exceed 600 words.

16. (a) Describe various physical factors of fresh water for fish farming.

Or

- (b) Give an account on riverine fishery of India.

17. (a) Describe the Prawn culture in fresh water.

Or

- (b) Write an essay on Pearl oyster culture with reference to seed technology of pearl production.

18. (a) Describe coastal fisheries of India.

Or

- (b) Write an essay on sewage fed fisheries.

19. (a) Describe various methods of fish preservation.

Or

(b) Describe in detail about fish by products and their industry uses.

20. (a) Write an essay on various bacterial diseases symptoms – treatment – therapy in fin fish.

Or

(b) Write an essay on marketing of fish in India.

(6 pages)

Reg. No. :

Code No. : 6091

Sub. Code : PZOE 41

M.Sc. (CBCS) DEGREE EXAMINATION,
NOVEMBER 2022.

Fourth Semester

Zoology

Elective — SERICULTURE

(For those who joined in July 2017-2020)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. Which of the following varieties of silk is not produced in India?
 - (a) Muga Silk
 - (b) Mulberry Silk
 - (c) Tassar Silk
 - (d) American Silk

2. Which of the following is not considered as a silk city of India?
- (a) Jaipur (b) Kanchipuram
(c) Bhagalpur (d) Pochampally
3. A lot of feedings is required at the
- (a) Silkworm stage (b) Cocoon state
(c) Egg stage (d) Both (b) and (c)
4. The two amino acids that enhances the micro propagation of mulberry plant are
- (a) Glycine and Proline
(b) Glutamine and Proline
(c) Proline and serine
(d) Serine and glycine
5. Rearing of late age worms begins from _____ instar.
- (a) Third (b) First
(c) Second (d) Last
6. In Silkworm rearing Hatching is _____ response.
- (a) Photo-periodic (b) Geo taxic
(c) Hydro (d) All

7. Milky disease affects _____ instar.
- (a) Early (b) Last
(c) Second (d) Pupa
8. Flecherie harms the _____ gut.
- (a) Larval (b) Pupa
(c) Adult (d) All
9. What is Stifling?
- (a) Spinning process of cocoon
(b) Killing process of caterpillar inside the worm
(c) Feeding process of caterpillar
(d) None of the above
10. What is the process of Degumming?
- (a) Boiling of silk cocoon
(b) Use of chemical agents
(c) Sun drying of cocoon
(d) All 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) Write short note on role of silk board.

Or

- (b) Describe an account non-mulberry silkworm.

12. (a) Write short note on Morphology of mulberry plant.

Or

- (b) Enumerate common diseases of mulberry.

13. (a) Describe an account on egg breeding stations.

Or

- (b) Write down chawki rearing.

14. (a) Describe an account on fungal diseases.

Or

- (b) Describe an account on protozoan diseases.

15. (a) Enumerate the storage of stifled cocoon.

Or

- (b) Write down the methods of silk reeling.

PART C — (5 × 8 = 40 marks)

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

Each answer should not exceed 600 words.

16. (a) Essay on sericulture in India.

Or

- (b) Explain the life cycle of *Bombyxmori*.

17. (a) Discuss about optimum condition for mulberry growth.

Or

- (b) Explain the following :

- (i) Harvesting
- (ii) Torage of mulberry leaves.

18. (a) Enumerate the rearing appliances.

Or

- (b) Explain rearing operations.

19. (a) Discuss about causative agent, symptom and treatment for bacterial diseases.

Or

- (b) Explain silkworm transgenic application.

20. (a) Explain reeling appliance.

Or

(b) Write an essay on raw silk testing.

(6 pages)

Reg. No. :

Code No. : 6423

Sub. Code : ZZOM 11

M.Sc. (CBCS) DEGREE EXAMINATION,
NOVEMBER 2022

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. New systematic differs from classical systematic in employing
 - (a) Numerical Taxonomy
 - (b) Experimental Taxonomy
 - (c) Biochemical and cytotaxonomy
 - (d) All biological characters

2. Coelom present in platyhelminthes is
 - (a) Acoelom
 - (b) Eucoelom
 - (c) Pseudocoelom
 - (d) Halmocoelom
3. Nutrition in Leucosolenia is
 - (a) Intracellular
 - (b) Intercellular
 - (c) Both
 - (d) None of these
4. Locomotory organ of starfish
 - (a) Arm
 - (b) Tube feet
 - (c) Stone canal
 - (d) Pedicellaria
5. In paramecium respiration is by
 - (a) Lung
 - (b) Body surface
 - (c) Gill
 - (d) Spiracle
6. Excretion in Amphibian is
 - (a) Ammonotelic
 - (b) Aminotelic
 - (c) Ureotelic
 - (d) Uricotelic
7. The star shaped ganglia in the mantle of cephalopods.
 - (a) Cranial ganglia
 - (b) Stellate ganglia
 - (c) Both
 - (d) None of these

8. Octopus belongs to the class
- (a) Gastropoda
 - (b) Cephalopoda
 - (c) Scaphopoda
 - (d) Pelecypode
9. The organization found in platyhelminthes is
- (a) Tissue grade (b) Organ grade
 - (c) Cellular grade (d) Protoplasmic grade
10. Larval form of starfish
- (a) Ophiopluteus
 - (b) Echinopluteus
 - (c) Bipinnaria
 - (d) Cucumaria

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 new trends in taxonomy.

Or

- (b) Write short notes grade of organization of coelom.

12. (a) Explain the food and feeding habits of lower formed metazoans.

Or

- (b) Explain the mechanism of locomotion on paramecium.

13. (a) Write short notes on Aerial Respiration.

Or

- (b) What are the respiratory pigments present in invertebrates?

14. (a) Describe the Nervous system of Penaeus.

Or

- (b) Write the evolution of nervous system.

15. (a) Differentiate the miracidium and cercaria Lerva.

Or

- (b) Enlist all affinities of Brachiopods.

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 taxonomic procedures to collect biological specimen.

Or

- (b) Enlist the basic concept of systematic and its significance.

17. (a) Explain the mechanism of locomotion in starfish.

Or

- (b) Describe the digestive system and mode of feeding in Nereis.

18. (a) Explain the mode of respiration in scorpion.

Or

- (b) Briefly explain the excretory system of Nereis.

19. (a) Describe the nervous system of starfish.

Or

- (b) Write a detailed account on the primitive nervous system of coelenterates.

20. (a) Describe the larval forms of phylum Mollusca.

Or

(b) Write detailed notes on structural features and affinities of mesozoa.

(6 pages)

Reg. No. :

Code No. : 6424

Sub. Code : ZZOM 12

M.Sc. (CBCS) DEGREE EXAMINATION,
NOVEMBER 2022.

First Semester

Zoology – Core

COMPARATIVE ANATOMY 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 name _____ is a reference to the fact that the notochord extends to the head
 - (a) Hemichordata
 - (b) Urochordata
 - (c) Cephalochordata
 - (d) Chordata

2. Notochord is confined to proboscis in
 - (a) Urochordata
 - (b) Hemichordata
 - (c) Cephalochordata
 - (d) Chordata

3. Dermis of vertebrate integument is derived from
 - (a) Ectoderm
 - (b) Mesoderm
 - (c) Endoderm
 - (d) Ecto-mesoderm

4. Integumentary gland secreting tears
 - (a) Mammary gland
 - (b) Sebaceous gland
 - (c) Lacrymal gland
 - (d) Uropygial gland

5. Which of the following is a pelvic bone?
 - (a) Ilium
 - (b) Scapula
 - (c) Clavicle
 - (d) Coracoid

6. In ruminants true stomach is represented by
 - (a) Abomasum
 - (b) Reticulum
 - (c) Rumen
 - (d) Omasum

7. Gills and lungs of vertebrates are the derivative of embryonic
- (a) Pharynx
 - (b) Archenteron
 - (c) Heart
 - (d) Kidney
8. The union of sinus venosus with right auricle in mammals is marked externally by:
- (a) Sulcus terminalis
 - (b) Crista terminalis
 - (c) Sinus venarum
 - (d) Appendix auriculae
9. Urinary bladder opens to exterior through
- (a) Ureter
 - (b) Urethra
 - (c) Pelvis
 - (d) Tubule
10. In mammals testes are found in:
- (a) Peyer's patches
 - (b) Bidder's organ
 - (c) Inguinal canal
 - (d) Scrotal canal

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 Protochordata.

Or

(b) Write the general characters of Hemichordata.

12. (a) Explain the types of vertebrate horns.

Or

(b) List out the kinds of scales in fishes.

13. (a) Compare skull of Amphibia and Reptilia.

Or

(b) Give a general account of accessory organs of oral cavity.

14. (a) Compare brain of Reptiles and Aves.

Or

(b) Elucidate evolution of aortic arches.

15. (a) Discuss an olfactory organ in vertebrates.

Or

(b) Illustrate organ of taste in 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 the types of epidermal glands.

18. (a) Compare alimentary canal of Scoliodon and Labeo.

Or

- (b) Describe skull in different vertebrates.

19. (a) Elucidate the respiratory organs in vertebrates.

Or

- (b) Explain the evolution of heart in vertebrates.

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

Or

(b) Illustrate the mechanism of hearing in vertebrates.

(6 pages)

Reg. No. :

Code No. : 6425

Sub. Code : ZZOM 13

M.Sc. (CBCS) DEGREE EXAMINATION,
NOVEMBER 2022.

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. Functional unit of biotic and abiotic system is termed as
 - (a) Ecosystem
 - (b) Autotrophs
 - (c) Heterotrophs
 - (d) Decomposers

2. The pattern of seasonal development is termed as
- (a) Phenological niche
 - (b) The regeneration niche
 - (c) Habitat niche
 - (d) Ecological efficiency
3. A set of local population within some large area is called as
- (a) Mega population
 - (b) Separation of population
 - (c) Divergent population
 - (d) Meta population
4. Movement of an individual in or out of the habit is called
- (a) Population factor
 - (b) Population dispersion
 - (c) Speciation
 - (d) Divergent population
5. Heterotrophs are
- (a) Producers
 - (b) Scavengers
 - (c) Consumers
 - (d) Decomposers

6. The succession begins at the dry place is termed as
- (a) Hydrarch
 - (b) Xerarch
 - (c) Mesarch
 - (d) Mesosere
7. The amount of organic material produced by plants per unit time is
- (a) Gross primary production
 - (b) Net primary production
 - (c) Energy flow
 - (d) Energy pyramid
8. The islands are called as
- (a) Oriental region
 - (b) Paradise of Evolution
 - (c) Neotropical region
 - (d) Palaeoartic region
9. Thick growth of phyto plankton and algae cause
- (a) Eutrophication
 - (b) Leaching
 - (c) Sedimentation
 - (d) Filtration

10. What does “Red data book” contains
- (a) Pollution
 - (b) Renewable energy
 - (c) Endangered species
 - (d) Non-renewable energy

PART B — (5 × 5 = 25 marks)

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

Each answer should not exceed 250 words.

11. (a) Define about abiotic component of an ecosystem.

Or

- (b) Examine the character displacement of an environment.

12. (a) Explain about population regulation.

Or

- (b) Summarize about herbivory.

13. (a) Determine about structure of community.

Or

- (b) Justify about types of ecological succession.

14. (a) Evaluate about nitrogen cycle.

Or

(b) Justify about grass land ecosystem.

15. (a) Write about causes of water pollution.

Or

(b) Justify-Project tiger.

PART C — (5 × 8 = 40 marks)

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

Each answer should not exceed 600 words.

16. (a) Describe about Ecological niche.

Or

(b) Describe about resource partitioning of the environment.

17. (a) Discuss about interaction and its types.

Or

(b) Describe about symbiosis.

18. (a) Distinguish about edges and ecostone.

Or

(b) Summarize about theories of climax community.

19. (a) Estimate primary and secondary production.

Or

(b) Summarize about terrestrial biomes.

20. (a) Formulate conservation of biodiversity.

Or

(b) Write about environmental impact assessment.

(6 pages)

Reg. No. :

Code No. : 6426

Sub. Code : ZZOM 14

M.Sc. (CBCS) DEGREE EXAMINATION,
NOVEMBER 2022.

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.

1. The buffer which remove the CO₂ is
 - (a) Carbonate
 - (b) Bicarbonate
 - (c) Proton
 - (d) Electron

2. Glutathione is
 - (a) Dipeptide
 - (b) Tripeptide
 - (c) Oligopeptide
 - (d) Polypeptide

3. The monosaccharides like glucose and fructose exist _____.
- (a) only in open straight chain
 - (b) only in ring form
 - (c) both open straight chain and ring form
 - (d) none of these
4. Mostly all the sugars in the plants are
- (a) D-sugar (b) L sugar
 - (c) Arabinose (d) Sucrose
5. Amino acids basically contain
- (a) NH_2 and COOH group
 - (b) COOH group only
 - (c) NH_2 group only
 - (d) None of the above
6. Intermediate of which of the following metabolic pathway have not been used in the synthesis of amino acids?
- (a) Glycolysis
 - (b) Fatty acid biosynthesis
 - (c) Citric acid cycle
 - (d) Pentose phosphate pathway

7. β -oxidation is well established by
- (a) saturated fatty acid
 - (b) unsaturated fatty acid
 - (c) both (a) and (b)
 - (d) none of the above
8. Sterol widely present in
- (a) Animal tissue only
 - (b) Plant tissue only
 - (c) Both Animal and Plant tissues
 - (d) None of these
9. Gout is a disorder of
- (a) Hypercholesterolemia
 - (b) Amino acid metabolism
 - (c) Protein metabolism
 - (d) Uric acid metabolism
10. Which vitamin is useful for the synthesis of Prothrombin?
- (a) Vitamin B
 - (b) Vitamin E
 - (c) Vitamin C
 - (d) Vitamin A

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 structure of atoms and molecules.

Or

- (b) Explain the properties of water in relation to life processes.

12. (a) Briefly explain carbohydrate metabolism.

Or

- (b) Write an account on regulation of blood sugar.

13. (a) Describe the chemical properties and functions of Phospholipids.

Or

- (b) Write short notes on :
- (i) Hypercholesterolemia
 - (ii) Hyperlipoproteinemia.

14. (a) Give a detailed account on Biological importance of Lipids.

Or

- (b) Briefly explain the biosynthesis of fatty acids.

15. (a) Write an account on fat soluble vitamins.

Or

- (b) Describe the 'salvage pathways' in nucleic acid synthesis.

PART C — (5 × 8 = 40 marks)

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

Each answer should not exceed 600 words.

16. (a) Define Covalent bond and explain the types, properties and examples.

Or

- (b) Derive the Henderson Hassel Balch equation.

17. (a) Describe the classification, structure and properties of Carbohydrates.

Or

- (b) Write detailed account on glycolysis.

18. (a) Explain the mechanism of enzyme action.

Or

(b) Describe the Urea cycle.

19. (a) Describe Beta oxidation of fatty acids.

Or

(b) Explain the role of liver in fat metabolism.

20. (a) Briefly discuss about water soluble and fat soluble vitamins.

Or

(b) Write an essay on Nucleic acid metabolic disorders.

(6 pages)

Reg. No. :

Code No. : 6427

Sub. Code : ZZOM 21

M.Sc. (CBCS) DEGREE EXAMINATION,
NOVEMBER 2022.

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 :

1. The rRNA is synthesized by
 - (a) golgi body
 - (b) nucleus
 - (c) nucleolus
 - (d) cytoplasm

2. _____ cell organelle is known as power house of the cell.
 - (a) Endoplasmic reticulum
 - (b) Golgi bodies
 - (c) Mitochondria
 - (d) Lysosomes

3. Fluid mosaic model of cell membrane was proposed by
- (a) Robertson
 - (b) Danielli and Davson
 - (c) Singer and Nicolson
 - (d) Watson and Crick
4. _____ is the process of ingestion of fluid materials by the cell through the plasma membrane
- (a) Pinocytosis
 - (b) Cell drinking
 - (c) Both (a) & (b)
 - (d) Endocytosis
5. _____ phase the young daughter cell grows in size by synthesizing cytoplasm.
- (a) G1
 - (b) G2
 - (c) Both (a) & (b)
 - (d) M
6. The study of different aspects of ageing is known as
- (a) Gerontology
 - (b) Chronology
 - (c) Palaeontology
 - (d) Odontology

7. DNA replication is
- (a) conservative
 - (b) semi-conservative and semi-discontinuous
 - (c) semi-conservative discontinuous
 - (d) conservative and discontinuous
8. A codon contains _____ nucleotides
- (a) 1
 - (b) 2
 - (c) 3
 - (d) 4
9. The _____ virus is used in transduction
- (a) lambda phage
 - (b) T7 phage
 - (c) T4 phage
 - (d) T2 phage
10. In Griffiths experiment, which of the following strains of pneumococci was isolated from dead mice?
- (a) Live rough cells
 - (b) Dead rough cells
 - (c) Live smooth cells
 - (d) Dead smooth cells

PART B — (5 × 5 = 25 marks)

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

Each answer should not exceed 250 words or 2 pages.

11. (a) Differentiate between plant cell and animal cell.

Or

- (b) Describe the polymorphism of lysosomes.

12. (a) Discuss about cell junctions and anchoring junctions.

Or

- (b) Write short notes on giant chromosome.

13. (a) Describe about cell death and its regulations.

Or

- (b) Mention characteristics of cancer cells.

14. (a) Explain about Hershey and Chase experiment.

Or

- (b) Comment on the structure of DNA.

15. (a) Describe the transfer of the F-element from F⁺ to F⁻ cell during conjugation.

Or

- (b) Explain the mechanism involved in the positive control system for the regulation of gene activity in Lac operon.

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 structure and function of mitochondria with neat diagram.

Or

- (b) Discuss about morphology and function of Endoplasmic reticulum.

17. (a) Describe the transport of molecules across the membranes.

Or

- (b) Comment on structural organization of Eukaryotic chromosomes.

18. (a) What is cell signaling? Summarize the steps involved in the process of cell communication.

Or

(b) Comment on mitotic cell division.

19. (a) Outline the DNA damage and their repair mechanisms.

Or

(b) Describe the structure, types and functions of RNA.

20. (a) Comment on regulation of gene expression in prokaryotes.

Or

(b) Explain about mechanism of gene transfer in bacteria.

(6 pages)

Reg. No. :

Code No. : 6428

Sub. Code : ZZOM 22

M.Sc. (CBCS) DEGREE EXAMINATION,
NOVEMBER 2022.

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. Which of the following stem cells are known as true stem cells?
 - (a) Totipotent cell
 - (b) Germi-potent cell
 - (c) Non-potent cell
 - (d) Pluripotent cell

2. An area which is committed to develop into a particular organ is called
 - (a) Organizer
 - (b) Morphogenetic field
 - (c) Gradient
 - (d) Organogenesis
3. The fertilized egg divides by the process of
 - (a) Oogenesis
 - (b) Cleavage
 - (c) Regeneration
 - (d) Invagination
4. How many cleavages are completed in the 16-celled stage of an egg?
 - (a) 12
 - (b) 8
 - (c) 4
 - (d) 3
5. Another word for the metamorphosis is
 - (a) Evolution
 - (b) Change
 - (c) Modeling
 - (d) Survival
6. How many stages are there in the incomplete metamorphosis?
 - (a) 1
 - (b) 2
 - (c) 4
 - (d) 3

7. Regeneration of a limb or tail is an example of
- (a) Epimorphosis
 - (b) Autotomy
 - (c) Compensatory hypertrophy
 - (d) Morphallaxis
8. The repair by cell division in the damaged tissue is called
- (a) Exponential growth
 - (b) Deaccelerating growth
 - (c) Epimorphosis regeneration
 - (d) Morphallaxis rgeneration
9. GIFT stands for _____.
- (a) Gamete intra fallopian transfer
 - (b) Gamete inter fallopian transfer
 - (c) Gamete infra fallopian traction
 - (d) Gamete inter fallopian traction
10. IVF involves transfer of _____.
- (a) Ovum into the fallopian tube
 - (b) Zygote into the fallopian tube
 - (c) Zygote into the uterus
 - (d) Embryo with 16 blastomeres into the fallopian tube.

PART B — (5 × 5 = 25 marks)

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

Each answer should not exceed 250 words.

11. (a) Discuss in brief about the concept of potency.

Or

- (b) Write short notes on cell lineage.

12. (a) Elucidate the characteristics of cleavage.

Or

- (b) Explain the types of morphogenetic movement patterns in gastrulation.

13. (a) Write short notes on Wolffian regeneration.

Or

- (b) Give a brief account of limbs development.

14. (a) Illustrate the evolutionary significance of Neoteny.

Or

- (b) Elucidate the types of Gradient theories.

15. (a) Briefly explain the factors responsible for male infertility.

Or

- (b) Write short notes on superovulation.

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 cytoplasmic determinants.

Or

- (b) Describe the nuclear factors involved in differentiation.

17. (a) Give a detailed account of metabolic and molecular changes during gastrulation.

Or

- (b) Specify the holoblastic type of cleavage.

18. (a) Discuss the physiological and biochemical changes during metamorphosis.

Or

- (b) Describe in detail about Neural differentiation.

19. (a) Describe the factors influencing regeneration.

Or

(b) Explain the factors affecting gradients.

20. (a) Discuss about causes of impotency in the male.

Or

(b) Write an essay on test tube babies and its advantages.

(6 pages)

Reg. No. :

Code No. : 6429

Sub. Code : ZZOM 23

M.Sc. (CBCS) DEGREE EXAMINATION,
NOVEMBER 2022.

Second Semester

Zoology – Core

GENETIC

(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 gene which controls many characters is called
(a) pleiotropic gene (b) co-dominant gene
(c) multiple gene (d) poly gene

2. Lack of independent assortment of two genes is due to
(a) recombination (b) crossing over
(c) linkage (d) repulsion

3. Crossing over takes place in the
 - (a) diakinesis stage
 - (b) anaphase stage
 - (c) pachytene stage
 - (d) leptotene stage

4. Theory of linkage was put forward by
 - (a) De vries (b) Sutton
 - (c) Bateson and Punnet (d) Morgan

5. The type of chromatin that participates in the active transcription of DNA to mRNA products is
 - (a) heterochromatin
 - (b) euchromatin
 - (c) Both (a) and (b)
 - (d) centromere

6. The fluid sample required for performing the amniocentesis test is
 - (a) the amnion
 - (b) the liquid surrounding the immediate foetus
 - (c) the placenta
 - (d) all of the above

7. The total sum of all the frequencies of the allele is
(a) one (b) two
(c) three (d) four
8. The set of all genes in any population is termed as
(a) population pool (b) species pool
(c) gene pool (d) genetic drift
9. Sickle cell diseases is due to
(a) point mutation
(b) frame shift mutation
(c) non-sequence mutation
(d) none of the above
10. The central lock of the composite transposable element consist a gene for
(a) transposase
(b) antibiotic resistance
(c) integrase
(d) lactamase

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 law of segregation with suitable example.

Or

- (b) Comment on erythroblastosis foetalis.

12. (a) Comment on tetrad analysis in Neurospora.

Or

- (b) Elaborate three point test cross in Drosopila.

13. (a) Write short note on Down's syndrome.

Or

- (b) Differentiate between lamp brush and polytene chromosome.

14. (a) Write short note on allelic frequency.

Or

- (b) Comment on inbreeding depression.

15. (a) Differentiate between intercalating and mutator genes.

Or

- (b) Mention the characteristics of transposable elements.

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 with suitable illustrations.

Or

- (b) Explain the polygenetic inheritance in human with suitable examples.

17. (a) Write an essay on sex-linked inheritance.

Or

- (b) Describe sex determination in humans.

18. (a) Explain aneuploidy and its types

Or

- (b) Enumerate the types of structural aberrations.

19. (a) Explain the Hardy Weinberg law with suitable example.

Or

- (b) Write an essay on different types of selection.

20. (a) Elaborate the inborn errors of metabolism.

Or

(b) Explain the different types of mutation

(6 pages)

Reg. No. :

Code No. : 6430

Sub. Code : ZZOM 24

M.Sc (CBCS) DEGREE EXAMINATION,
NOVEMBER 2022.

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. The idea of use and disuse of organs was given by
 - (a) Lamarck
 - (b) Morgan
 - (c) Darwin
 - (d) Hugo de Vries

2. Most famous and important theory of evolution by Darwin is
 - (a) nomenclature
 - (b) natural selection
 - (c) nature
 - (d) survival

3. A new species emerges from this geographic range of its ancestor as per this theory of speciation
- (a) Sympatric speciation
 - (b) Parapatric speciation
 - (c) Allopatric speciation
 - (d) None of these
4. The model of evolution that involves a slow, progressive change at a more or less constant rate is:
- (a) Gradualism
 - (b) punctuated equilibrium
 - (c) progressive equilibrium
 - (d) equilibrium
5. A phylogenetic diagram can be rooted or unrooted.
- (a) True
 - (b) False
 - (c) Can be true or false
 - (d) Can not say
6. Rooted phylogenetic tree is a _____ with a unique node.
- (a) undirected tree
 - (b) directed tree
 - (c) binary tree
 - (d) red black tree

7. A molecular clock relies upon the assumption that
- (a) molecules are stable for long time
 - (b) mutations in DNA accumulate at roughly a constant rate
 - (c) matings are random in this population
 - (d) prokaryotes are more easily classified than eukaryotes
8. Single stranded unpaired extensions formed by restriction enzyme upon cleavage is called as
- (a) blunt end (b) flush end
 - (c) sticky end (d) both (a) and (b)
9. What is the consequence of a change in the genetic diversity
- (a) results in loss of biological diversity
 - (b) leads to an increase in the population
 - (c) results in loss of human species only
 - (d) causes pollution
10. What does extinct mean?
- (a) Being alive
 - (b) Being dead
 - (c) A species having no living members
 - (d) A species with a large population

PART B — (5 × 5 = 25 marks)

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

11. (a) Write short notes on Darwinism.

Or

- (b) Write short notes on Altruism.

12. (a) Elucidate the mechanism of microevolution with examples.

Or

- (b) Write an account on Simpson's adaptive grid.

13. (a) Explain about phylogenetics trees?

Or

- (b) Discuss in detail about distance method of phylogenetic inference.

14. (a) Write short notes on Restriction enzyme sites.

Or

- (b) Give a brief account of Molecular clocks.

15. (a) Write short notes on Metapopulation.

Or

- (b) Discuss the human causes of extinction.

PART C — (5 × 8 = 40 marks)

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

Each answer should not exceed 600 words.

16. (a) Elaborate the principles of Lamarckism with examples.

Or

- (b) Briefly discuss about Palaeozoic Era.

17. (a) Give a detailed account on Mechanism of Macroevolution.

Or

- (b) Discuss the factors influencing speciation.

18. (a) Elaborate the Immunological techniques for phylogenetic tree construction.

Or

- (b) Elucidate the character based phylogenetic inference.

19. (a) Give a detailed account on DNA-DNA hybridization.

Or

- (b) Illustrate in detail about the aminoacid phylogeny.

20. (a) Discuss about the sources of genetic variation.

Or

(b) Describe the models in metapopulation.

(6 pages)

Reg. No. :

Code No. : 6431

Sub. Code : ZZOM 31

M.Sc. (CBCS) DEGREE EXAMINATION,
NOVEMBER 2022.

Third Semester

Zoology – Core

COMPARATIVE ANIMAL PHYSIOLOGY

(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. Cold blooded animals undergo —————.
 - (a) Hibernation
 - (b) Migration
 - (c) Aestivation
 - (d) All of these

2. Nocturnal life behavior commonly seen in which animals
- (a) tropical forests
 - (b) marine
 - (c) desert
 - (d) polar region
3. Which of the following are not a thermoregulatory mechanism in natural?
- (a) Basking
 - (b) Acclimation
 - (c) Hibernation
 - (d) Aestivation
4. A person on a long hunger strike, surviving only on water will have
- (a) less amino acids in his urine
 - (b) more sodium in his urine
 - (c) less urea in his urine
 - (d) more glucose in his blood
5. In adult man total alveolar surface area in the lungs is
- (a) 10 m²
 - (b) 50 m²
 - (c) 100 m²
 - (d) 125 m²

6. Pneumatic centre which can moderate the functions of the respiratory rhythm centre is present at
- (a) Pons region of brain
 - (b) thalamus
 - (c) spinal cord
 - (d) right cerebral hemisphere
7. Which amongst the following is responsible for formation of stone in human kidney?
- (a) calcium acetate (b) calcium oxalate
 - (c) sodium acetate (d) sodium benzoate
8. Which of the following hormone is produced by a pituitary gland in both males and females but functional only in a female?
- (a) Relaxin
 - (b) Prolactin
 - (c) Vasopressin
 - (d) Somatotrophic hormones
9. Which one of the following sets of ions is necessary in the chemical events for muscle contraction?
- (a) Na^+ and K^+ (b) Ca^+ and Mg^{++}
 - (c) Na^+ and Ca^{++} (d) Na^+ and Mg^{++}

10. Neurons are specialized to receive, conduct and transmit
- (a) electrochemical signals
 - (b) action potentials
 - (c) electrical signals
 - (d) chemical signals

PART B — (5 × 5 = 25 marks)

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

Each answer should not exceed 250 words.

11. (a) Summarise the Homeostatic regulation.
- Or
- (b) Explain the parasitic habitats of adaptation.
12. (a) State that the role of endocrine in heat regulation.
- Or
- (b) Describe the mechanism of osmoregulation.
13. (a) Narrate the account on chemical regulation of respiration.
- Or
- (b) Explain about the structure of lungs and its parts.

14. (a) Describe the excretory products of the animals.

Or

- (b) Classify the endocrine glands.

15. (a) Explain about the synapse.

Or

- (b) Describe about the action potential.

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 the adaptation and its levels.

Or

- (b) Enumerate the physiological adaptation marine organisms.

17. (a) Examine the thermoregulatory mechanism

Or

- (b) Justify the osmoregulation in aquatic organisms.

18. (a) Point out the O₂ transport.

Or

(b) Enumerate the respiratory pigments and list out.

19. (a) Classify the animals based on excretory products.

Or

(b) Explain the role of reproductive hormones.

20. (a) Discuss about the structure of neurons and its types.

Or

(b) Summaries the mechanism of muscle contraction.

(6 pages)

Reg. No. :

Code No. : 6432

Sub. Code : ZZOM 32

M.Sc.(CBCS) DEGREE EXAMINATION,
NOVEMBER 2022.

Third Semester

Zoology

ANIMAL 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 :

1. Polymerase used for PCR is extracted from
 - (a) Homo sapiens
 - (b) Thermus aquaticus
 - (c) Escherichia coli
 - (d) Saccharomyces cerevisiae

6. In which of the following method, the enzyme is bound to a suitable adsorbent material rendering it immobile?
- (a) Adsorption
 - (b) Covalent binding
 - (c) Entrapment
 - (d) Membrane confinement
7. In 1990 the first gene therapy was given to treat which deficiency?
- (a) Smallpox
 - (b) Vitamin E deficiency
 - (c) Diabetes
 - (d) Adenosine deaminase
8. Chromatography technique is used in which stage of downstream processing
- (a) solid liquid separation
 - (b) concentration
 - (c) purification
 - (d) formulation

9. The bioremediation process involving the usage of plants to degrade pollutants is
- (a) Composting (b) Biopile
- (c) Phytoremediation (d) Land farming
10. Which of the following organisms used for treating oil spills?
- (a) *Thiobacillus novellus*
- (b) *Escherichia coli*
- (c) *Staphylococcus aureus*
- (d) *Pseudomonas putida*

PART B — (5 × 5 = 25 marks)

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

Each answer should not exceed 250 words.

11. (a) Classify the enzymes modification.
- Or
- (b) Explain the basic steps of gene cloning.
12. (a) Define Plasmids and explain the PBR322.
- Or
- (b) Describe about the liposome fusion and its advantages.

13. (a) Explain about the microbial leaching.

Or

(b) Narrate the applications of enzymes in various field.

14. (a) Describe the microbial production of tissue plasminogen activator.

Or

(b) Explain the DNA fingerprinting and its uses.

15. (a) Classify about the Biogas production.

Or

(b) Summaries the account on phytoremediation

PART C — (5 × 8 = 40 marks)

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

Each answer should not exceed 600 words.

16. (a) Detailed account on chemical synthesis of oligonucleotides.

Or

(b) Explain the restriction enzymes.

17. (a) Enumerate the molecular markers.

Or

(b) Write an essay about DNA libraries.

18. (a) Describe the Intellectual Property Rights.

Or

(b) Detailed account on Biosensors and its types.

19. (a) Explain the Gene therapy with suitable example.

Or

(b) Justify the application of biotechnology in vaccines with suitable examples.

20. (a) Enumerate the downstream processing in production.

Or

(b) Discuss about the Biomining.

(6 pages)

Reg. No. :

Code No. : 6433

Sub. Code : ZZOM 33

M.Sc. (CBCS) DEGREE EXAMINATION,
NOVEMBER 2022.

Third Semester

Zoology — Core

RESEARCH METHODOLOGY

(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. Tell the first section of research book
 - (a) Discussion
 - (b) Introduction
 - (c) Bibliography
 - (d) Results

2. Select the part of thesis in which researcher's gratitude is expressed
 - (a) acknowledgement
 - (b) abstract
 - (c) appendix
 - (d) all of them

3. Rewriting the materials from others research work is
- (a) declaration (b) plagiarism
(c) food note (d) appendix
4. Predict the impact factor of 10 or greater is considered as an
- (a) excellent score (b) good score
(c) average score (d) poor score
5. Name the stain which colour the cells without killing
- (a) acidic stain (b) basic stains
(c) gram stain (d) vital stains
6. Predict the device in which tungsten lamp is used as the light source
- (a) fluorescence microscope
(b) electron microscope
(c) phase contrast microscope
(d) spectrophotometer

7. Choose the correct one of the following which is related with FTIR
- (a) Founders infrared spectroscopy
 - (b) Fourier transform infrared spectroscopy
 - (c) Thin layer chromatography
 - (d) X ray fluorescence spectroscopy
8. Choose the tool in which helium and hitrogen are used a scarier gas
- (a) TLC
 - (b) Gas chromatography
 - (c) Vertical electrophoresis
 - (d) PAGE
9. Select the device in which the wavelength of the colour gives an information of the element
- (a) flame photometry (b) amount of element
 - (c) nature of element (d) light
10. Select an instrument which follows Beer lambert law
- (a) pH meter (b) Spectrophotometer
 - (c) Electrophoresis (d) Chromatography

PART B — (5 × 5 = 25 marks)

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

Each answer should not exceed 250 words.

11. (a) Enumerate in detail about bibliography.

Or

- (b) Comment on acknowledgement and declaration.

12. (a) Summarizes about the citation index.

Or

- (b) Interpret about peer review journals.

13. (a) Write down the importance of Confocal microscope.

Or

- (b) Explain about the cytotechniques.

14. (a) Illustrate the ultra centrifuge.

Or

- (b) Explain about mechanical homogenization.

15. (a) Summarizes the basic principle of electrophoresis.

Or

- (b) Order all the application of pulse field electrophoresis.

PART C — (5 × 8 = 40 marks)

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

Each answer should not exceed 600 words.

16. (a) Discuss in detail about the results and discuss of thesis.

Or

- (b) Elaborate the importance of materials and methods.

17. (a) Discuss the writing of scientific papers.

Or

- (b) Summarises the importance of plagiarism.

18. (a) Illustrate the principle, parts and uses of TEM.

Or

- (b) Write the principle and uses of phase contrast microscope.

19. (a) Elaborate the structure and application of nuclear magnetic resonance spectroscopy.

Or

- (b) Discuss the X ray fluorescence spectroscopy.

20. (a) Summarizes principle, parts and application of Bomb calorimeter.

Or

- (b) Assess the differences and applications of horizontal and vertical gel electrophoresis.
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(6 pages)

Reg. No. :

Code No. : 6434

Sub. Code : ZZOM 34

M.Sc. (CBCS) DEGREE EXAMINATION,
NOVEMBER 2022.

Third Semester

Zoology — Core

MICROBIOLOGY

(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. Who is known as the father of microbiology?
 - (a) Edwin John Butler
 - (b) Antoni van Leeuwenhoek
 - (c) Robert Koch
 - (d) Ferdinand Cohn

2. Which of the following is an essential preliminary to the tree reconstruction?
- (a) Sequence alignment
 - (b) Sequence validation
 - (c) Model selection
 - (d) Model build
3. Which of the following bacteria requires nicotinic acid as a growth factor in their media?
- (a) *Nitrosomonas* sp.
 - (b) *Proteus vulgaris*
 - (c) *Leuconostoc mesenteroides*
 - (d) *E.coli*
4. The bacterium that infects other gram-negative bacteria is
- (a) *Proteus mirabilis*
 - (b) *Haemophilus influenza*
 - (c) *Bdellovibrio*
 - (d) *Pseudomonas putida*
5. Which major organ can be affected by untreated syphilis?
- (a) Eye
 - (b) Brain
 - (c) Liver
 - (d) Kidney

6. Which is the infective form of the malaria parasite?
- (a) Bradyzoite (b) Tachyzoite
(c) Oocyst (d) Sporozoite
7. Which of the following is used as a biofertilizer for soybean crop?
- (a) *Nostoc* (b) *Azospirillum*
(c) *Rhizobium* (d) *Azotobacter*
8. State that the salmonellosis involves
- (a) An enterotoxin and exotoxin
(b) An enterotoxin and cytotoxin
(c) A cytotoxin only
(d) An exotoxin and cytotoxin
9. Which one of the following is not included in the mechanism of bioleaching?
- (a) Acidolysis (b) Complexolysis
(c) redoxolysis (d) Hydrolysis
10. Which of the following species has a shorter body size?
- (a) *Epifilis* (b) *Endogens*
(c) *Aneciques* (d) *Eudrilus*

PART B — (5 × 5 = 25 marks)

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

11. (a) Summarise the history of microbiology.

Or

- (b) Give an outline for the phylogenetic tree construction.

12. (a) Explain about the differential medium of microbial culture.

Or

- (b) Describe about the continuous culture method for microorganisms.

13. (a) *Treponema pallidum* is a sexually transmitted disease - Explain.

Or

- (b) Describe about the biology and pathology of candidiasis.

14. (a) Analyze the biochemical changes of food spoilage by microorganism.

Or

- (b) Summarise the role microbes in vaccine production.

15. (a) State that the history of bioremediation.

Or

(b) Explain about the importance of vermicomposting for agriculture.

PART C — (5 × 8 = 40 marks)

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

16. (a) Summarise the classification of microorganism.

Or

(b) Bergeys manual systematic bacteriology - Justify.

17. (a) Examine the isolation and purification techniques in bacteria.

Or

(b) Enumerate the gram positive and gram negative bacteria.

18. (a) Summarise the biology and pathology of salmonella sp.

Or

(b) Highlight the mode of transmission, symptoms and control measures of poliomyelitis.

19. (a) Classify the genera of VAM fungi.

Or

(b) Discuss about the classification of microorganism of milk.

20. (a) Enumerate the bioreactors for bioremediation process.

Or

(b) Highlight the principle, types and significance of immobilization.
