VIVEKANANDA COLLEGE, TIRUVEDAKAM WEST
(Autonomous & Residential)
[Affiliated to Madurai Kamaraj University]

M.Sc. Zoology Degree (Semester) Examinations, November 2018
Part – III : Core Subject : First Semester : Paper – I

BIOCHEMISTRY
Under CBCS – Credit 4

Time: **3** Hours Max. Marks: **75**

SECTION – A

Answer ALL Questions : **(5 × 1 = 5)**

1. The β oxidation takes place in

   a) Mitochondrion b) Lysosome c) Nucleus d) Golgi complex

2. In muscles, anaerobic conditions change pyruvic acid to

   a) $C_3H_6O_3$ b) C_2H_4O c) $C_3H_4O_3$ d) C_2H_3OH

3. Hyperammonemia – type I occurs due to the deficiency of

   a) Carbamoyl phosphate synthase b) Ornithine transcarbamoylase

   c) Arginosuccinate synthase d) Arginosuccinase

4. The total concentration of cholesterol in plasma ranges from _____ to _____ mg per 100 ml for a normal adult.

   a) 50, 100 b) 150, 220 c) 300, 320 d) 400, 420

5. The regulatory enzyme in the pyrimidine biosynthesis in animals is

   a) Fructose-6- Phosphatase b) Aldolase

   c) Carbamoyl phosphate synthetaseII d) PRPP- Synthetase.

SECTION – B

Answer any FIVE Questions : **(5 × 2 = 10)**

6. Summarize the properties of polysaccharides.
7. Explain about the holo enzymes.
8. Illustrate the splitting of sugar.
9. Classify the glycogenesis and glycogenolysis.
10. Classify the transamination and transdeamination.
11. Show the overall reactions of palmitic acid oxidation.
12. Explain shortly about the biosynthesis of purine.

SECTION – C

Answer ALL Questions : **(5 × 6 = 30)**

13. a) Identify the role of hormone in protein metabolism.

(OR)

b) What are pigments? Organize the fate of biliverdin and bilirubin.

14. a) Classify the steps involved in pathway of Glycogenesis.

(OR)

b) Construct the association of muscle and liver in Cori cycle.

15. a) Identify the toxic ammonia into non-toxic ammonia by Ornithine cycle.

(OR)

b) Write about Transmethylation? And explain a model for the transfer of methyl group to noradrenalin.

16. a) Identify the reactions involved in the fatty acid synthesis.

(OR)

b) Construct a cycle for β oxidation of fatty acid in mitochondria.

17. a) Develop the flow chart for the Pyrimidine biosynthesis.

(OR)

b) Organize the Watson and Crick model of DNA.

SECTION – D

Answer any THREE Questions : **(3 × 10 = 30)**

18. List out the mechanism of enzyme action.
19. Explore the steps involved in Uronic acid path way.
20. What are the amino acids take part in the Pyruvic acid cycle? Explain it.
21. Examine the formation of Ketone bodies.
22. Distinguish the different types of RNA and their function.

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M.Sc. Zoology Degree (Semester) Examinations, November 2018
Part – III : Core Subject : First Semester : Paper – II

CELL AND MOLECULAR BIOLOGY

Under CBCS – Credit 4

Time: **3** Hours Max. Marks: **75**

SECTION – A

Answer ALL Questions : **(5 × 1 = 5)**

1. CO_2 is the primary product of
   a) Lactate fermentation b) Glycolysis
   c) Krebs cycle d) Electron transport phosphorylation
2. Which structure is directly responsible for the formation of proteins within the cell?
   a) lysosomes b) vacuoles c) centrioles d) ribosomes
3. _____ is a tumour arising from epithelial cells
   a) Osteoma b) Lymphoma c) Fibroma d) Carcinoma
4. Choose the correct statement about the genetic code.
   a) includes 61 codons for amino acids and 3 stop codons
   b) three bases per codon
   c) some amino acids are coded by multiple codons
   d) all of the above
5. In terms of lac Operon regulation, what happens when *E. coli* is grown in medium containing both glucose and lactose?
   a) Both CAP and the lac repressor are bound to the DNA
   b) CAP is bound to the DNA but the lac repressor is not
   c) Lac repressor is bound to the DNA but CAP is not
   d) Neither CAP nor the lac repressors are bound to the DNA

SECTION – B

Answer any FIVE Questions : **(5 × 2 = 10)**

6. What does permeability of the cell membrane mean?
7. Define – Autophagy.
8. What happens during splicing?
9. Derive the term cell aging and Cell death.
10. Define the term RFLP.
11. What is regulated gene expression?
12. What are the start and stop codons?

SECTION – C

Answer ALL Questions : **(5 × 6 = 30)**

13. a) Explain the Krebs cycle with Proper Diagram?

(OR)

b) Write a short notes on Chemical composition of Cell membrance.

14. a) Write short notes on protein synthesis in Prokaryotes.

(OR)

b) Write Classification of Enzymes and based on the reactions.

15. a) Discuss in brief causes of Cancer cell.

(OR)

b) Draw the structure and types of RNA with suitable example.

16. a) Write Differences between DNA and RNA.

(OR)

b) Draw the structure of Waston and Crick model of DNA.

17. a) Write brief notes on regulation of gene expression in prokaryotes.

(OR)

b) Write a short notes on Biogensis of Ribosome's.

SECTION – D

Answer any THREE Questions : **(3 × 10 = 30)**

18. Write a detail notes on different types of cell membrance models.
19. Describe structure and functions of Lysosomes.
20. Write elaborate notes on difference between mitotic and meiotic cell division.
21. Discuss in brief the genetic code of overlapping genes.
22. Write a detail notes on Lac-Operon regulate the gene expression.

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M.Sc. Zoology Degree (Semester) Examinations, November 2018
Part – III : Core Subject : First Semester : Paper – III

MICROBIOLOGY
Under CBCS – Credit 4

Time: **3** Hours Max. Marks: **75**

SECTION – A

Answer ALL Questions : **(5 × 1 = 5)**

1. Which one of the following is prokaryotes ribosomes?
   a) 80s b) 40s c) 60s d) 70s
2. In the _____ phase, the cells divided rapidly at a constant
   a) Lag phase b) Log phase
   c) Stationary phase d) Decline phase
3. The only effective type of immunity toward tuberculosis is _____ immunity?
   a) Humoral b) Cell mediated c) Both A and B d) None
4. Nitrogen fixation refers to the direct conversion of atmospheric nitrogen gas into
   a) Ammonia b) Glucose c) ATP d) Nitrate
5. The fungal enzymes pectinases is produced by _____.
   a) Rhizopus b) Pecillium
   c) Aspergillum Niger d) All the above

SECTION – B

Answer any FIVE Questions : **(5 × 2 = 10)**

6. What are fungi?
7. Name the components in a culture medium.
8. How will you define the term antibiotic?
9. List out the factors influencing aquatic microbial population.
10. Name any four microorganisms in soil.
11. What is downstream processing?
12. What do you mean by fermentation?

SECTION – C

Answer ALL Questions : **(5 × 6 = 30)**

13. a) How will you differentiate a prokaryotic and a eukaryotic cell?

(OR)

b) Discuss the features of Five Kingdom Concept.

14. a) Explain any six types of culture media.

(OR)

b) Describe any three modes of reproduction in bacteria.

15. a) Discuss the symptoms of a person affected by polio virus.

(OR)

b) Explain the control measures of Candidiasis.

16. a) Give an account on microbes in waste water.

(OR)

b) Explain the role of microbes in recycling of nitrogen.

17. a) Differentiate food spoilage and food poisoning.

(OR)

b) Describe the construction of a fermenter.

SECTION – D

Answer any THREE Questions : **(3 × 10 = 30)**

18. Analyze the ultra structure of a bacterial cell with a neat diagram.
19. Compare the Batch culture technique of bacteria with continuous culture.
20. Give an elaborate account on causative agent, symptoms and treatment of Tuberculosis.
21. Discuss the biological treatment of waste and pollutants.
22. Explain any five food preservation methods.

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M.Sc. Zoology Degree (Semester) Examinations, November 2018
Part – III : Elective Subject : First Semester : Paper – I

BIOINFORMATICS
Under CBCS – Credit 5

Time: **3** Hours Max. Marks: **75**

SECTION – A

Answer ALL Questions : **(5 × 1 = 5)**

1. Which shortcut make selected text Italic?
   a) Ctrl + I b) Ctrl + A c) Ctrl + S d) Ctrl + V
2. The virus that spread in application software is called as
   a) Boot virus b) Macro virus c) File virus d) Anti-virus
3. Getentry and GTOP are the database resources of
   a) NCBI b) DDBJ c) EMBL d) Swiss-Prot
4. In gene prediction, the method rely on statistical information derived from known sequences is known as
   a) Pattern based b) Comparative
   c) Computational d) Content based
5. The modelled protein are evaluated through
   a) Internal evaluation b) external evaluation
   c) Verify 3D d) All the above

SECTION – B

Answer any FIVE Questions : **(5 × 2 = 10)**

6. Define- first generation of computer.
7. What do you mean by Modem?
8. Comment on Antivirus.
9. What is bioinformatics?
10. Define – PAM.

11. Comment on BLAST.
12. What is homology modeling?

SECTION – C

Answer ALL Questions : **(5 × 6 = 30)**

13. a) What are the components of computers?

(OR)

b) Briefly explain the classification of computers.

14. a) How to create a web page by using HTML?

(OR)

b) Differentiate between Booting virus and EXE. virus.

15. a) Give a brief note on Data design.

(OR)

b) Explain the structure of DDBJ.

16. a) Write short notes on multiple sequence alignment.

(OR)

b) Elucidate the maximum like hood method for phylogenetic analysis.

17. a) Enumerate the secondary structure predictions of protein with limitations.

(OR)

b) Give an account of comparative modelling.

SECTION – D

Answer any THREE Questions : **(3 × 10 = 30)**

18. Describe the MS Excel software package and its statistical applications.
19. Discuss the creation and management of E-mail.
20. Explain in detail about structure and sequence submission of EMBL.
21. Analyse the Gene prediction methods and its difficulties.
22. Give a detailed account on Ramachandran plot.

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M.Sc. Zoology Degree (Semester) Examinations, November 2018
Part – III : Core Subject : Third Semester : Paper – I

GENETICS
Under CBCS – Credit 4

Time: **3** Hours Max. Marks: **75**

SECTION – A

Answer ALL Questions : **(5 × 1 = 5)**

1. Phenotypic ratio of the expression of complementary genes is
   a) 3:1 b) 9:7 c) 1:2:1 d) 9:3:3:1
2. Conjugation between F^+ and F^-cells results in
   a) F^-cells become F^+cells b) Two F^-cells
   c) F^+ and F^-cells remain same d) Both become F^-cells
3. Most types of virus particles show which types of symmetries?
   a) Complex and helical b) Cuboid and helical
   c) Bilateral and helical d) Complex and bilateral
4. Which of the following is the name of the human genetic disorder resulting from defects in nucleotide excision repair?
   a) Hereditary nonpolyposis colorectal cancer (HNPCC)
   b) Xeroderma pigmentosum (XP)
   c) Lynch syndrome
   d) Diabetes
5. The main objective of Human genome project is
   a) To find out the exact functions of proteins in human
   b) To sequence entire base pairs in 23 chromosomes
   c) To find out the active genes in human genome
   d) To sequence entire base pairs in 23 chromosomes

SECTION – B

Answer any FIVE Questions : **(5 × 2 = 10)**

6. State the Law of Independent Assortment.
7. What is testcross?
8. Comment on Hfr strain.
9. Write short notes on competence.
10. Differentiate specialized transduction from generalized transduction.
11. Comment on Okazaki fragments.
12. What is tautomeric shift?

SECTION – C

Answer ALL Questions : **(5 × 6 = 30)**

13. a) Write a brief account on Mendels experimental organism the garden pea.

(OR)

b) Describe the fine structure of gene.

14. a) What are plasmids? Classify their types.

(OR)

b) "Griffith unusual experimental results paved way for the mechanism of transformation" – Explain.

15. a) Elucidate the role of any five enzymes involved in DNA replication.

(OR)

b) Highlight the effect of transposition and categorise the types of transposon.

16. a) Evaluate the role of frame shift and suppressor mutation.

(OR)

b) Narrate the events involved in Holliday model of recombination.

17. a) Explain the intricacies of Human Genome Project.

(OR)

b) Discuss the genetic basis of cancer.

SECTION – D

Answer any THREE Questions : **(3 × 10 = 30)**

18. "Gene interactions lead to deviation from Mendelian concept" – Explain with any two examples.
19. Summarise the structure of lambda phage and outline the mechanisms in lysogenic pathway.
20. Explain the parasexual process involved in conjugation.
21. Outline the mechanisms involved in different types of DNA repair.
22. Discuss the strategies in Genetic counseling and add a note on the symbols used in pedigree analysis.

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M.Sc. Zoology Degree (Semester) Examinations, November 2018
Part – III : Core Subject : Third Semester : Paper – II

PHYSIOLOGY
Under CBCS – Credit 4

Time: **3** Hours Max. Marks: **75**

SECTION – A

Answer ALL Questions : **(5 × 1 = 5)**

1. Sea water has a specific gravity of about
   a) 1.022 b) 1.023 c) 1.024 d) 1.026
2. The structural and functional unit of the nervous system is
   a) Neuron b) Synapse c) Axon d) Dendrites
3. Normal adult resting heart beats
   a) 17 bpm b) 42 bpm c) 72 bpm d) 120 bpm
4. Which one of the following flows through spinal canal?
   a) Plasma b) Serum
   c) Cerebro spinal fluid d) Hilus
5. Diastole occurs due to
   a) Nerve impulse from vagus b) Elastic recoil of arteries
   c) Relaxation of Heart muscles d) All of these

SECTION – B

Answer any FIVE Questions : **(5 × 2 = 10)**

6. Doppler Effect.
7. Surface tension.
8. Heat therapy.
9. Voluntary muscle.
10. Biocybernetics.
11. Cryobiology.
12. AAS.

SECTION – C

Answer ALL Questions : **(5 × 6 = 30)**

13. a) Comment on dialysis.

(OR)

b) Write briefly about Ficks law.

14. a) Give an account on Bioluminescence.

(OR)

b) Discuss about physiology of heat therapy.

15. a) Explain the mechanic of pulmonary ventilation.

(OR)

b) Write about haemodynamics.

16. a) Comment on biocybernetics.

(OR)

b) Write briefly about biological clock.

17. a) Describe in detail about Gel electrophoresis.

(OR)

b) Explain the working mechanism of HPLC.

SECTION – D

Answer any THREE Questions : **(3 × 10 = 30)**

18. Write in detail about inter and intra molecular forces.
19. Discuss about electric organs in animals.
20. Explain about thermodynamics in biological system.
21. Write about muscle movement.
22. Describe the principle and mechanism of NMR.

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M.Sc. Zoology Degree (Semester) Examinations, November 2018
Part – III : Core Subject : Third Semester : Paper – III

PRINCIPLES OF BIOTECHNOLOGY
Under CBCS – Credit 4

Time: **3** Hours Max. Marks: **75**

SECTION – A

Answer ALL Questions : **(5 × 1 = 5)**

1. The desire to maintain a safe laboratory environment for all begins with _____?
   a) prevention b) microbiology c) ubiquity d) accidents
2. The first molecules of thin enzyme recognise specific site within the DNA but do not cleave and producing heterogeneous population of DNA, the enzyme is
   a) Type-I Restriction enzymes b) Type-II Restriction enzymes
   c) Type-III Restriction enzymes d) Type-IV Restriction enzymes
3. $M_{13}$is a filamentous phage of *E.coli* which infects only such cells which contain
   a) Sex pilli b) Cell wall c) Peptidoglycon d) Karyon
4. The technique that determines, in which tissue or under which physiological conditions of a gene is expressed to produce a protein
   a) Eastern blotting b) western blotting
   c) southern blotting d) northern blotting
5. A collection of clones that represents the complete genome of an organism is called as
   a) cDNA library b) oligo – dc – tailing
   c) genomic library d) RNA – DNA – library

SECTION – B

Answer any FIVE Questions : **(5 × 2 = 10)**

6. Define Bioethics.
7. What is meant by biowar?
8. What are molecular glues?
9. What is the use of recognition sites of DNA?
10. Define – Western Blotting.
11. What is Taq polymerase?
12. What are uses of genomic libraries?

SECTION – C

Answer ALL Questions : **(5 × 6 = 30)**

13. a) Give short notes on scope of biotechnology.

(OR)

b) Write short notes on ethical issues.

14. a) What are ligases? Explain their types and functions.

(OR)

b) Give short notes on DNA and RNA markers.

15. a) Write about cosmids and phagemids.

(OR)

b) How recombinant DNA can be identified? Explain.

16. a) Discuss about southern blotting technique.

(OR)

b) Give a note on DNA sequencing.

17. a) Write short notes on genomic libraries.

(OR)

b) Describe gene cloning strategies.

SECTION – D

Answer any THREE Questions : **(3 × 10 = 30)**

18. Write short notes on

i) Biosafety

ii) Patents and IPR

19. Elaborate an essay on restriction endonucleases.
20. Give a detailed account on plasmids and cosmids.
21. Elucidate the process of Polymerase Chain Reaction (PCR).
22. Give an essay on methods on gene transfer.

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M.Sc. / M.Com. Degree (Semester) Examinations, November 2018
Part – IV : Non-Major Subject : Third Semester : Paper – I

APPLIED BIOLOGY

Under CBCS – Credit 5

Time: **3** Hours Max. Marks: **75**

SECTION – A

Answer ALL Questions : **(5 × 1 = 5)**

1. The main aim of dairy farming is to create
   a) White revolution b) Blue revolution
   c) Green revolution d) All the above
2. Foot and mouth disease is caused by
   a) Fungi b) Protozoa c) Virus d) Bacteria
3. Human growth hormone is secreted by
   a) Pituitary gland b) Adrenal gland
   c) Thyroid gland d) Pancreas
4. The determination of the order of various genes along the length of a chromosome is called
   a) Gene mapping b) Gene sequencing
   c) Gene Library d) Gene prediction
5. The Scientific technique used to detect the possible risks of GEO's is called
   a) Risk modelling b) Risk Evaluation
   c) Containments d) Bio-weapons

SECTION – B

Answer any FIVE Questions : **(5 × 2 = 10)**

6. Comment on Pest.
7. What is Paedogenesis?
8. What is Callus?
9. Comment on Invitro fertilization.
10. Define Plasmid.
11. Define Karyotype.
12. What are adjuvants?

SECTION – C

Answer ALL Questions : **(5 × 6 = 30)**

13. a) Explain briefly the soil profile. **(OR)**
    b) Describe the various methods of water conservation.
14. a) What is single cell peotein? Summarize the uses of SCP. **(OR)**
    b) Describe the fermener tank with a diagram.
15. a) Elucidate the structure of Human growth hormones. **(OR)**
    b) Write a detailed account on Hybridization.
16. a) What are vaccines ? Write a brief note on Immunization Schedule for children. **(OR)**
    b) Enumerate the advantages of Human genome project.
17. a) Discuss the biohazards of rDNA technology. **(OR)**
    b) Analyze the possible dangers of genetically engineered organisms.

SECTION – D

Answer any TWO Questions : **(3 × 10 = 30)**

18. Elaborate the Renewable and non-renewable energy resources.
19. Narrate the method of plant tissue culture and its significance.
20. Elucidate the method of embryo transfer technique with neat diagram.
21. Write an account on Gene therapy.
22. How do genetically modified organisms employed in the management of environmental wastes.

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