Course Code: 31CT11

VIVEKANANDA COLLEGE, TIRUVEDAKAM WEST

Residential & Autonomous – A Gurukula Institute of Life-Training
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M.Sc. Zoology Degree (Semester) Examinations, November 2020

Part – III : Core Subject : First Semester : Paper – I

Course Title: BIOCHEMISTRY

Under CBCS and OBE– Credit 4

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

SECTION – A

Answer ALL Questions: **(5 X 1 = 5 Marks)**

1. The term biochemistry was introduced by
   a) Neuberg b) Funk c) Noop d) Henseleit
2. In hexose monophosphate shunt, the net formation of ATP molecules is
   a) 38 b) 36 c) 35 d) 34
3. Which of the following plays a special role in the brain metabolism?
   a) Glutamate b) Pyruvate c) Aspartate d) Lysine
4. The major site for the metabolism of prostaglandins are the
   a) Liver b) Lungs c) Heart d) Brain
5. The end product of purine metabolism in humans is
   a) Xanthine b) Uric acid c) Urea d) Allantoin

SECTION – B

Answer Any Five Questions: **(5 X 2 = 10 Marks)**

6. What is pentose?
7. Define: Isoenzymes.
8. What is gluconeogenesis?
9. Comment on transdeamination.
10. What is transmethylation?
11. Name any two steroid hormones.
12. Define: Coenzymes.

SECTION – C

Answer ALL Questions: **(5 X 6 = 30 Marks)**

13. a) Expound the structure of D-glucose. (OR)
    b) With suitable diagram, discuss the mechanism of enzyme action.
14. a) Briefly explain the intermediary metabolism. (OR)
    b) Through suitable diagram, describe the HMP shunt pathway.
15. a) What is oxidative deamination? Explain it with suitable examples. (OR)
    b) Examine critically the metabolism of glutamate family of amino acids.
16. a) Define metabolism. Explain the metabolism of cholesterol. (OR)
    b) Comment on ketogenesis.
17. a) Bringout the various classes of RNA and add a note on their significances. (OR)
    b) Elucidate the biosynthesis of purines.

SECTION – D (Analyzing)

Answer Any Three Questions: **(3 X 10 = 30 Marks)**

18. Classify lipids and provide examples.
19. Discuss the metabolism of polysaccharides.
20. Through suitable illustrations, explain the ornithine cycle.
21. Discuss elaborately the oxidation of fatty acids.
22. With suitable diagram, explain the Watson-Crick model of DNA.

Course Code: 31CT12

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M.Sc. Zoology Degree (Semester) Examinations, November 2020

Part – III: Core Subject: First Semester: Paper – I

COURSE TITLE: **CELL AND MOLECULAR BIOLOGY**

Under CBCS and OBE– Credit 4

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

SECTION – A Multiple Choice Questions
Answer All Questions: (5X1=5 Marks)

1. During cell division chromosome attaches with spindle.
   a. Kinetochore b. Centromere c. Contriole d. Secondary constriction
2. The formation of RNA complementary to a DNA strand is called.
   a. Transcription b. Translation c. Processing d. Gene Amplification
3. Protein synthesis occurs inside the _____
   a. Nucleus b. Cytoplasm c. Nucleolus d. Ribosomes
4. _____ is a tumour arising from epithelial cells
   a. Osteoma b. Lymphoma c. Fibroma d. Carcinoma
5. Mutation theory of Carcinogenesis was proposed by
   a. Jacobson b. Warburg c. Murphey d. Campbell

SECTION – B VERY SHORT ANSWER
Answer any Five Questions: (5X2=10 Marks)

6. Define liposomes.
7. Describe the ultrastructure of mitochondria.
8. Distinguish the primary and secondary active transport.
9. What is the main function of endoplasmic reticulum?
10. Comment on hydrolytic enzymes. .
11. Write a short note about glycosylation.
12. What is the role of autophagy?

SECTION – C SHORT ANSWER
Answer any Three Questions (5X6 = 30 Marks)

13.a) Describe the fluid mosaic model of cell membranes.

(OR)

b) Enumerate the enzymes functioning in the mitochondria.

14.a) Discuss the importance and regulation of TCA cycle.

(OR)

b) List out the lysosomal enzymes? Mention their functions.

15.a) What is signal hypothesis? Give the detailed mechanism involved in protein targeting.

(OR)

b) Describe in brief the molecular arrangements of DNA.

16.a) Explain about the role of enzymes in DNA replication.

(OR)

b) Describe the molecular mechanism of gene regulation in *lac* operon.

17.a) Explain the stages of polypeptide synthesis and its regulation.

(OR)

b). Describe structural features of t-RNA molecule and its role.

SECTION - D LONG ANSWER

Answer any Two Questions: **(3X10=30 Marks)**

18. Explain in detail the transport mechanisms of ions through cell membrane.

19. Write an account on the structure and functions of endoplasmic reticulum.

20. Discuss the characteristics features, causes and carcinogens of cancer.

21. What is genetic regulation and explain the operon concept?

22. Write an essay on gene regulation in eukaryotes with neat sketch.

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Course Code: 31CT13

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M.Sc. Zoology Degree (Semester) Examinations, November 2020

Part – III : Core Subject : First Semester : Paper – I

Course Title: MICROBIOLOGY

Under CBCS and OBE– Credit 4

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

SECTION – A

Answer ALL Questions: **(5 X 1 = 5 Marks)**

Multiple Choice Questions from Question Bank (One Question from each Unit)

1. Whittaker proposed a five kingdom concept in the year___
   a. 1979 b. 1955 c. 1969 d. 1972
2. EMBA medium is another differential medium used for _____ culture.
   a. *Neisseria gonorrhea* b. *Vibrio parahaemolyticus* c. *Cholera* d. *E. coli*
3. Which one of the following is Opportunistic fungal infections?
   a. Candidiasis b. Ringworm c. Typhoid d. Dengue
4. Nitrogen fixation refers to the direct conversion of atmospheric nitrogen gas into
   a. Ammonia b. Glucose c. ATP d. Nitrate
5. . _____ is the preservation of food by putting it in a metal container and sealing it air tight
   a. Pickling b. Salting c. Canning d. Aseptic processing

SECTION – B

Answer Any Five Questions:(at least One Question from each Unit) **(5 X 2 = 10 Marks)**

6. What is mesosome?
7. Comment Koch's postulates.
8. Comment on methods of bacterial cell counts.
9. What do you mean by normal flora?
10. Define the term epidemiology.
11. What is nitrification?
12. List any four fungal enzymes.

SECTION – C

Answer ALL Questions: **(5 X 6 = 30 Marks)**

13. a) Explain the five kindom concepts (OR)
b) With a neat sketech discuss the ultra structure of a prokaryotic cell.
14. a) Explain the following bacterial culture system:
    i. Batch caulture,
    ii. Continuous culture (OR)
b) Give a short note on maintenance and storage of a microbial culture.
15. a) How can a normal flora microorganism become an opportunistic pathogen? Discuss with suitable example. (OR)
b) Give a brief account on *Mycobacterium tuberculosis* and discuss its transmission and treatment.
16. a) What is trickling filter? Describe the mechanism involved in this process. (OR)
b) Highlight the role of oxidation ponds in the treating sewage water.
17. a) Narrate the various pathways of fermentation and a note on its applications. (OR)
b) Define pasteurization. Summarize the role of microbes in manufacturing and preservation of dairy products.

SECTION – D

Answer Any Three Questions: **(3 X 10 = 30 Marks)**

18. Differentiate the prokaryotic and eukaryotic microorganisms with suitable examples.
19. Write an essay on various types of culture media and discuss its significance.
20. Give a detailed account on the biology of polio virus and describe its transmission and control measures.
21. Elucidate the sewage treatment and mention its significance .
22. State and explain the various methods of food preservation.

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Course Code: **31EP11**

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M.Sc. Zoology Degree (Semester) Examinations, November 2020

Part – III : Core Subject : First Semester : Paper – I

Course Title: Bioinformatics

Under CBCS and OBE– Credit 5

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

SECTION – A

Answer ALL Questions: **(5 X 1 = 5 Marks)**

Multiple Choice Questions

1. Which key can be used to view Slide show? CO1
   a. F5 b. F2 c. F7 d. F9
2. What is the name of first computer virus? CO2
   a. The Famous b. HARLIE c. PARAM d. Creeper
3. Getentry and GTOP are the database resources of CO3
   a. NCBI b. DDBJ c. EMBL d. Swiss-Prot
4. In gene finding the method rely on statistical information derived from known sequences to predict is CO4
   a. Pattern based b. content basedc. computational based d. comparative based
5. In the structural proteomics, the secondary structures of protein that are widely seen is CO5
   a. α- helix b. β-sheets c. loops d. Ribbons

SECTION – B (Understanding)

Answer Any Five Questions:(at least One Question from each Unit) (5 X 2 = 10 Marks)

6. List out the characters of computer CO1
7. Expand ENIAC and EDVAC CO1
8. What is a computer virus? CO2
9. State the importance of internet CO2
10. Write short notes on ENTREZ of NCBI CO3
11. Differentiate cladistic and phenetic method of phylogeny CO4
12. Brief the salient features of NN method of secondary structure prediction of protein CO5

SECTION – C

Answer ALL Questions: **(5 X 6 = 30 Marks)**

13. a) Discuss the important components of a computer (OR) CO1
    b) What are the advantages and disadvantages of MS Word? CO1
14. a) Write an account on creation of webpage using HTML (OR) CO2
    b) Explain various types of computer viruses with examples CO2
15. a) Explain the home page of NCBI (OR) CO3
    b) Discuss the submission tools of NCBI and GEO CO3
16. a) Enumerate the representation and types of phylogenetic tree (OR) CO4
    b) Describe intrinsic and extrinsic methods of gene prediction CO4
17. a) How will you evaluate a protein structure using Ramachandran plot (OR) CO5
    b) Describe the procedure and methodology of homology modelling of protein CO5

SECTION – D

Answer Any Three Questions: **(3 X 10 = 30 Marks)**

18. Write a detailed account on the generation of computers CO1
19. How will you create and manage an e-mail? CO2
20. Explain the classification of biological databases CO3
21. Describe the types and comparision procedures for BLAST Analysis CO4
22. Give an account on various secondary structures of protein and their prediction methods CO5

Course Code: 31CT31

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M.Sc. Zoology Degree (Semester) Examinations, November 2020

Part – III : Core Subject : Third Semester : Paper – I

Course Title: GENETICS

Under CBCS and OBE– Credit 4

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

SECTION – A (Remembering)

Answer ALL Questions: **(5 X 1 = 5 Marks)**

Multiple Choice Questions from Question Bank (One Question from each Unit)

1. Cistron is

   a) The functional unit of DNA coding a specific polypeptide

   b) A non – coding sequence of DNA

   c) DNA sequence prone to mutate d) Removable sequence of DNA during splicing.

2. Genetic transfer from one bacterium to another mediated by virus is called

   a) Recombination b) Conjugation c) Transformation d) Transduction

3. Nucleosome is made up of _____

   a. DNA, histone core protein, linker H1 b. DNA, histone core protein

   c. RNA, histone core protein d. RNA, histone core protein, linker H1

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. Which of the following malformation in a newborn is specific for maternal insulin dependent diabetes mellitus?

   a. Transposition of great arteries b. Caudal regression

   c. Holoprosencephaly d. Meningmyelocele

SECTION – B (Understanding)

Answer Any Five Questions:(at least One Question from each Unit) **(5 X 2 = 10 Marks)**

6. State Mendelian law of dominanace.
7. Define recon.
8. What is genetic notation?
9. Define transposable elements.
10. What is photreactivation?
11. Interpratate the term frameshift mutation.
12. Mention the significance of human genome project.

SECTION – C (Applying)

Answer ALL Questions: **(5 X 6 = 30 Marks)**

13. a) Summarize the deviations in the heredity, from Mendelian concept with appropriate illustrations.

(OR)

b) Write down the protocol for the gene isolation and restriction mapping.

14. a) Describe the pattern of inheritance in haploid organisms with reference to honeybees.

(OR)

b) Narrate the techniques to detect the recombinant plasmids.

15. a) Exemplify the genetic organization of viruses with labelled setches.

(OR)

b) W rite a short note on genetic organization of the phage λ with a sketch.

16. a) Describe various types of mutation giving pictorial representation.

(OR)

b) Give an account on different kinds of genetic recombination.

17. a) Highlight the significance of pedigree analyses in the medical field.

(OR)

b) Enlight the human society through the principles of eugenics, euthenics,and Euphenics.

SECTION – D (Analyzing)

Answer Any Three Questions: **(3 X 10 = 30 Marks)**

18. Explain the fine structure of gene with a neat diagram.
19. Trace the path of bacterial chromosome transfer during conjugation by Hfr strains with stepwise labelled sketches.
20. Analyze the genetic transfer aspects in generalised and specialized transduction.
21. Elaborate the DNA repairing mechanisms with the explanatory figures.
22. Discuss congenital malformation with suitable illustrations.

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Course Code: 31CT32

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M.Sc. Zoology Degree (Semester) Examinations, November 2020

Part – III : Core Subject : Third Semester : Paper – I

Course Title: PHYSIOLOGY

Under CBCS and OBE– Credit 4

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

SECTION – A

Answer ALL Questions: **(5 X 1 = 5 Marks)**

1. Gills are typically the respiratory organs of
   a. Terrestrial animals b. Aerial animals c. Aquatic animals d. Fossorial animals
2. The structural and functional unit of the nervous system is
   a. Neuron b. Synapse c. Axon d. Dendrites
3. The functional unit of contractile system in a striated muscle is
   a. Myofibril b. Cross bridges c. Z band d. Sarcomere
4. Which one of the following maintains the balance of the body?
   a. Cerebrum b. Cerebellum c. Medulla oblongata d. Calyx
5. The life span of RBC is
   a. 100 days b. 110 days c. 120 days d. 150 days

SECTION – B

Answer Any Five Questions: **(5 X 2 = 10 Marks)**

6. What are the respiratory organs found in the animals?
7. What you mean by buoyancy?
8. Comment on mega voltage therapy.
9. What is bioluminescence?
10. What is cardiac cycle?
11. Define: Nerve impulse.
12. Distinguish between open and closed circulatory system.

SECTION – C

Answer ALL Questions: **(5 X 6 = 30 Marks)**

13. a) Explain the mechanism of transport of gases. (OR)
    b) Name the invertebrate hormones of reproduction and add a note on its controls.
14. a) What is meant by receptors? Explain its physiology in detail. (OR)
    b) What is phototheraphy? Discuss its significance.
15. a) Examine critically the counter current mechanism with illustration. (OR)
    b) Discuss the mechanism of muscle contraction.
16. a) Enlist the properties of inter neuron. (OR)
    b) Explain briefly the physiology of behaviour in animals.
17. a) Write a short note on blood flow and blood pressure. (OR)
    b) Give a brief account on body fluids.

SECTION – D

Answer Any Three Questions: **(3 X 10 = 30 Marks)**

18. "Oxygen as a limiting factor in the environment". Substanctiate.
19. What is bioelectricity? How will you measure it?
20. Discuss the mechanics of pulmonary ventilation.
21. Describe the structure of central nervous system.
22. Discuss elaborately the composition of blood.

Course Code:31CT33

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M.Sc. Zoology Degree (Semester) Examinations, November 2020

Part – III : Core Subject : Third Semester : Paper – III

PRINCIPLES OF BIOTECHNOLOGY

Under CBCS and OBE– Credit 4

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

SECTION – A

Answer ALL Questions: **(5 X 1 = 5 Marks)**

1. Patent protects
   a. Discovery b. Invention c. New invention d. Both (a) and (b)
2. The enzymes that cleave nucleotide at a time from an end of a polynucleotide chain are
   a. Endo nucleases b. Restriction enzymes c. Exo nucleases d. Restriction endo nucleases
3. The Ti plasmid grouped based on opine are
   a. Octopine b. Nopaline c. Agropine d. All the above
4. The first phases of PCR technique is
   a. Denaturation b. annealing c. deannealing d. Synthesis
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 X 2 = 10 Marks)**

6. Write any two significance of patent rights.
7. What are the intrinsic features of λ exo-nuclease
8. Mention the importance of T_4 DNA polymerases.
9. What are shuttle vectors?
10. What is DNA chip? Mention its application.
11. Comment on Northern Blotting technique.
12. List out the gene cloning strategies.

SECTION – C

Answer ALL Questions: **(5 X 6 = 30 Marks)**

13. a) Enumerate the biosafety methods in nucleic acid research (OR)
    b) What are patent rights? Describe the agencies and procedure for obtaining a patent right.
14. a) Describe the features and types of Ti plasmid. (OR)
    b) How will you identify the recombinant DNA using INDIRECT method?
15. a) Write an elaborate notes on RNases and Endo-nuclease (OR)
    b) Explain the features of Exo-nucleases I, III and Bal 31 Exo-nuclease
16. a) Explain the Sanger's method of DNA sequencing. (OR)
    b) Differentiate the principles and applications of Western and Southern blotting.
17. a) Give a short note on gene cloning (OR)
    b) Enumerate the methodology and evolution of colony hybridization.

SECTION – D

Answer Any Three Questions: **(3 X 10 = 30 Marks)**

18. Write an essay on present scenario and scopes in the field of biotechnology in India
19. Explain in detail the types and Ligation mechanism of DNA Ligase.
20. Give a detailed account on plasmid vectors, their characters, types and applications.
21. Discuss in detail the principles, methods and applications of PCR.
22. Explain in detail the strategies and methods of gene transfer.

Course Code:31NE31

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M.Com./M.Sc. Degree (Semester) Examinations, November 2020

Part – III : NME : Third Semester

Course Title: ECONOMIC ZOOLOGY

Under CBCS and OBE– Credit 5

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

SECTION – A

Answer ALL Questions: **(5 X 1 = 5 Marks)**

1. The preferred species for composting of urban waste is_____
   a) *Pheretima elongate* b) *Eudrilus eugeniae* c) *Eisenia fetida* d) *Lumbricus terrestris*
2. Who is the father of Apiculture?
   a) Lanstroth b) Quinby c) Johann Dzierzon d) Miller
3. The importane food fish is
   a) Rohu b) Catla c) Wallago d) Clarius
4. Study of mulberry is called
   a) Sericulture b) Moriculture c) Apicuture d) Aquaculture
5. Foot and mouth disease is caused by
   a) Protozoa b) Bacteria c) Virus d) Fungi

SECTION – B

Answer Any Five Questions: **(5 X 2 = 10 Marks)**

6. What is Hermaphrodite?
7. Mention the characteristics of vermicasts.
8. Comment on wax moth.
9. What is monoculture?
10. What is hypophysation?
11. What is Bed cleaning?
12. Mention the scope of dairy farming.

SECTION – C

Answer ALL Questions: **(5 X 6 = 30 Marks)**

13. a)Explain the bacis requirements of vermitechnology.

(OR)

b) Write the biology of *Eisenia fetida.*

14. a) Explain the structure of Newton's bee hive and comment on its advantages.

(OR)

b) Analyse the uses of bee venom and bees wax.

15. a) Describe the life cycle of *Bombyx mori* with suitable diagrams.

(OR)

b) Discuss the different types of rearing equipments and their uses.

16. a) Enlist the salient features of catla

(OR)

b) Enumerate the characteristics of culturable fishes.

17. a) Narrate the nutritive value of milk.

(OR)

b) Explain the characteristics of Jersey breed.

SECTION – D

Answer Any Three Questions: **(3 X 10 = 30 Marks)**

18. What is vermiwash? Discuss the method of prepataion, composition and application of vermiwash.

19. Discuss the nutritive and medicinal value of Honey.

20. Describe the Method of propagation in Mulberry.

21. Enumerate the Induced spawning technique in Indian major carps.

22. Give an account of Housing and managerial aspects of a Dairy farm.

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