

"Education for Knowledge, Science and Culture"
-Shikshanmaharshi Dr. Bapuji Salunkhe
Shri Swami Vivekanand Shikshan Sanstha's
VIVEKANAND COLLEGE (AUTONOMOUS), KOLHAPUR
B. Sc. Part – II CBCS Syllabus with effect from June, 2019
ZOOLOGY-DSC -1008C
Semester: III Zoology-Paper- III
PHYSIOLOGY AND BIOCHEMISTRY
Theory: 72 Hours - (92 lectures of 48 minutes) Credits -04

SECTION I

UNIT- I

Nerve and muscle **10**

Structure of a neuron, Resting membrane potential, Origin of action potential and its propagation in non-myelinated nerve fibres, Ultra-structure of skeletal muscle, Molecular and chemical basis of muscle contraction.

Digestion **6**

Physiology of digestion in the alimentary canal; Absorption of carbohydrates, proteins, lipids

UNIT- II

Respiration **7**

Pulmonary ventilation, Respiratory volumes and capacities, Transport of Oxygen and carbon dioxide in blood, Respiratory Diseases.

Excretion **5**

Structure of nephron, Mechanism of Urine formation, Counter-current Mechanism

Cardiovascular system **8**

Composition of blood, Structure of Heart, Origin and conduction of the cardiac impulse, Cardiac cycle, Heart Attack-Symptoms and Remedies

SECTION II

UNIT- III

Endocrine Glands **9**

Structure and function of pituitary, thyroid, parathyroid, pancreas, adrenal, hypothalamus, tests and ovary.

Carbohydrate Metabolism **10**

Glycolysis, Krebs Cycle, Pentose phosphate pathway, Gluconeogenesis, Glycogen metabolism, Review of electron transport chain

UNIT- IV

Lipid Metabolism **5**

Biosynthesis and β oxidation of palmitic acid

Protein metabolism 5
Transamination, Deamination and Urea Cycle

Enzymes 7
Introduction, Mechanism of action, Enzyme Kinetics, Michaelis and Menten equation, Inhibition and Regulation

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B. Sc. Part – II CBCS Syllabus with effect from June, 2019

ZOOLOGY-DSC -1008D

Semester: IV Zoology-Paper- IV

CELL BIOLOGY, GENETICS AND EVOLUTION

Theory: 72 Hours - (92 lectures of 48 minutes) Credits -4

SECTION I

UNIT-I

Ultra structure of cell organelle 8

Structure of prokaryotic and eukaryotic cell, Ultra structure and function of – Plasma membrane, Nucleus, Mitochondria, Golgi apparatus, Endoplasmic reticulum, Ribosomes

Introduction to Genetics 3

Mendel's work on transmission of traits, Genetic Variation

Mendelian Genetics and its Extension 7

Principles of Inheritance, Chromosome theory of inheritance, Incomplete dominance and codominance, Multiple alleles with respect to ABO, RH blood group, extra-chromosomal inheritance

UNIT-II

Linkage, Crossing Over 5

Types of Linkage and mechanism of crossing over, Coupling and Repulsion theory, Cytological evidence of crossing over

Mutations 5

Chromosomal Mutations: Deletion, Duplication, Inversion, Translocation, Frameshift mutation, Aneuploidy and Polyploidy; Gene mutations: Induced versus Spontaneous mutations.

Sex Determination 8

Dosage compensation, Sex chromosomal theory of sex determination, Geneic balance theory, haploidy-diploidy mechanism, environmental sex determination

SECTION II

UNIT-III

History of Life 5

Major Events in History of Life, Geological time scale

Introduction to Evolutionary Theories 4

Lamarckism, Darwinism, Neo-Darwinism

Processes of Evolutionary Change 8

Organic variations; Isolating Mechanisms; Natural selection (Example: Industrial melanism); Types of natural selection (Directional, Stabilizing, Disruptive), Artificial selection

UNIT-IV

Direct Evidences of Evolution 5

Types of fossils, Process of Fossilization, Dating of fossils, Geiger-Muller Counter

Species Concept 5

Biological species concept (Advantages and Limitations); Modes of speciation (Allopatric, Sympatric)

Macro-evolution 5

Macro-evolutionary Principles (example: Darwin's Finches)

Extinction 4

Mass extinction (Causes, Names of five major extinctions, K-T extinction in detail), Role of extinction in evolution

ZOOLOGY LAB (III) : DSC 1008C (Practical) PHYSIOLOGY AND BIOCHEMISTRY Credits-04

PRACTICAL

1. Preparation of hemin and hemochromogen crystals
2. Study of permanent histological sections of mammalian pituitary, thyroid, pancreas, adrenal gland, testes, ovary
3. Study of permanent slides of spinal cord, duodenum, liver, lung, kidney, bone, cartilage
4. Qualitative tests to identify functional groups of carbohydrates in given solutions (Glucose, Fructose, Sucrose, Lactose)
5. Estimation of total protein in given solutions by Lowry's method.
6. Study of activity of salivary amylase under optimum conditions (pH and Temperature)

Skill Enhancement course

7. Detection of abnormal urine constituents from given sample
8. Detection of blood groups
9. Measurement of lung capacity by respirometer
10. Measurement of human blood pressure

11. Detection of bleeding and clotting time of own blood
12. Interpretation of ECG.
13. Preparation of blood smear and Differential Leukocyte Count (D.L.C) using Leishman's stain
14. Erythrocyte Sedimentary Rate (E.S.R)

ZOOLOGY LAB(III) : DSC 1008D (Practical)
CELLBIOLOGY, GENETICS AND EVOLUTION
Credits-04

PRACTICAL

1. Demonstration of nucleus from W.B.Cs.
2. Cytological preparation of mitochondria
3. Demonstration of Barr bodies
4. To study mitosis in onion root tip
5. Isolation of DNA
6. Study of Mendelian Inheritance and gene interactions (Non Mendelian Inheritance) using suitable examples.
7. Study of Linkage, recombination using the data.
8. Study of Human Karyotypes (normal and abnormal).
9. Study of fossil evidences from plaster cast models and pictures
10. Study of homology and analogy from suitable specimens/ pictures
11. Charts: a) Phylogeny of horse with diagrams/ cut outs of limbs and teeth of horse ancestors
b) Darwin's Finches with diagrams/ cut outs of beaks of different species
12. Study of polytene chromosome
13. Visit to Natural History Museum and submission of report

Skill Enhancement course

14. Identification and characterization of aquarium Fishes
15. Food and feeding of Aquarium fishes: Preparation and composition of formulated fish feed
16. Fish Transportation: Fish Handling, Packing and forwarding technique
17. Aquarium construction and Maintenance

SUGGESTED READINGS

- Gardner, E.J., Simmons, M.J., Snustad, D.P. (2008). *Principles of Genetics*. VIII Edition. Wiley India.
- Snustad, D.P., Simmons, M.J. (2009). *Principles of Genetics*. V Edition. John Wiley and Sons Inc.
- Klug, W.S., Cummings, M.R., Spencer, C.A. (2012). *Concepts of Genetics*. X Edition. Benjamin Cummings.
- Russell, P. J. (2009). *Genetics- A Molecular Approach*. III Edition. Benjamin Cummings.
- Griffiths, A.J.F., Wessler, S.R., Lewontin, R.C. and Carroll, S.B. *Introduction to Genetic Analysis*. IX Edition. W. H. Freeman and Co.
- Ridley, M. (2004). *Evolution*. III Edition. Blackwell Publishing
- Barton, N. H., Briggs, D. E. G., Eisen, J. A., Goldstein, D. B. and Patel, N. H. (2007).

- *Evolution*. Cold Spring, Harbour Laboratory Press.
- Hall, B. K. and Hallgrímsson, B. (2008). *Evolution*. IV Edition. Jones and Bartlett Publishers
- Campbell, N. A. and Reece J. B. (2011). *Biology*. IX Edition, Pearson, Benjamin, Cummings.
- Douglas, J. Futuyma (1997). *Evolutionary Biology*. Sinauer Associates.
- Tortora, G.J. and Derrickson, B.H. (2009). *Principles of Anatomy and Physiology*, XII Edition, John Wiley & Sons, Inc.
- Widmaier, E.P., Raff, H. and Strang, K.T. (2008) *Vander's Human Physiology*, XI Edition., McGraw Hill
- Guyton, A.C. and Hall, J.E. (2011). *Textbook of Medical Physiology*, XII Edition, Harcourt Asia Pvt. Ltd/ W.B. Saunders Company
- Berg, J. M., Tymoczko, J. L. and Stryer, L. (2006). *Biochemistry*. VI Edition. W.H Freeman and Co.
- Nelson, D. L., Cox, M. M. and Lehninger, A.L. (2009). *Principles of Biochemistry*. IV Edition. W.H. Freeman and Co.
- Murray, R.K., Granner, D.K., Mayes, P.A. and Rodwell, V.W. (2009). *Harper's Illustrated Biochemistry*. XXVIII Edition. Lange Medical Books/Mc Graw3Hill.

Nature of Question Paper

- Instructions:** 1) All the questions are **compulsory**.
 2) Figures to the right indicate **full** marks.
 3) Draw neat labeled diagrams **wherever** necessary.

Time : 3 hours

Total Marks: 80

SECTION-I

Q.1. Choose correct alternative. (8)

- | | | | | |
|-------|----|----|----|----|
| i) | A) | B) | C) | D) |
| ii) | A) | B) | C) | D) |
| iii) | A) | B) | C) | D) |
| iv) | A) | B) | C) | D) |
| v) | A) | B) | C) | D) |
| vi) | A) | B) | C) | D) |
| vii) | A) | B) | C) | D) |
| viii) | A) | B) | C) | D) |

Q.2. Attempt any Two. (16)

- A)
- B)
- C)

Q.3. Attempt any Four

(16)

- A)
- B)
- C)
- D)
- E)
- F)

SECTION-II

Q.4. Choose correct alternative.

(8)

- i) A) B) C) D)
- ii) A) B) C) D)
- iii) A) B) C) D)
- iv) A) B) C) D)
- v) A) B) C) D)
- vi) A) B) C) D)
- vii) A) B) C) D)
- viii) A) B) C) D)

Q.5. Attempt any Two.

(16)

- A)
- B)
- C)

Q.6. Attempt any Four

(16)

- A)
- B)
- C)
- D)
- E)
- F)

SCHEME OF MARKING (THEROY)

Sem.	Core Course	Marks	Evaluation	Sections	Answer Books	Standard of passing
I	DSC1008C	80	Semester wise	Two sections each of 40 marks	As per Instruction	35% (28 marks)
II	DSC1008D	80	Semester wise	Two sections each of 40 marks	As per Instruction	35% (28marks)

SCHEME OF MARKING (CIE) Continuous Internal Evaluation

Sem.	Core Course	Marks	Evaluation	Sections	Answer Books	Standard of passing
I	DSC1008 C	20	Concurrent	-	As per Instruction	35% (7 marks)
II	DSC1008 D	20	Concurrent	-	As per Instruction	35% (7 marks)

SCHEME OF MARKING (PRACTICAL)

Sem.	Course	Marks	Evaluation	Sections	Standard of passing
I AND II	DSC1008 C(Pr)	100	Annual	As per Instruction	35%
	DSC1008 D (Pr)				

***A separate passing is mandatory**