**"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 equestion, Inhibition and Regulation

**"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 -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 Hallgrimsson, 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). T*extbook 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**