Solapur University, Solapur

NAAC Accredited-2015
'B'Grade(CGPA-2.62)

B.Sc. Part- II ZOOLOGY

Semester III and IV

Choice Based Credit System (CBCS) Pattern SYLLABUS w.e.f. 2017-18

SOLAPUR UNIVERSITY, SOLAPUR
Faculty of Science
Choice Based Credit System (CBCS)
(W.e.f. 2017-18)

· **Title of the Course:** B.Sc. Part-II

• **Subject:** Zoology

• **Introduction:** This course provides a broad overview of Zoology and to produces expert hands that would have sufficient knowledge and expertise to solve the urgent problems of the region by using Zoology. The course structure is basic science centric where students learn core science and are taught necessary fundamental subject for that purpose.

• **Objectives of the course:** The objectives of B. Sc. Zoology course are:

- To provide an intensive and in depth learning to the students in field of Zoology.
- Beyond simulating, learning, understanding the techniques, the course also addresses the underlying recurring problems of disciplines in today scientific and changing world.
- To develop awareness & knowledge of different organization requirement and subject knowledge through varied branches and research methodology in students.
- To train the students to take up wide variety of roles like researchers, scientists, consultants, entrepreneurs, academicians, industry leaders and policy.

• **Advantages of the Course:** Zoology has tremendous job potential.

- The successful students will be able to establish research orgnizations with the help of agriculture, environment protection and also their own industry for transgenic animals, clinical pathology, genetic counseling, human karyotyping etc.
- Scientific Research Organizations.
- Universities in India & aboard

Solapur University, Solapur

Faculty of Science

Choice Based Credit System (CBCS)

(w.e.f.2017-18)

Structure for B. Sc-II

Subject/ Core Course	Name and Type of the Paper		No. of papers/ Practical	Hrs/week			Total Marks Per Paper	UA	CA	Credits
	Type	Name		L	T	P				
Class :	**B.Sc.- II Semester - III**									
	Core	ZOOLOGY 1	Paper V- Animal Diversity -III	3	--	--	100	70	30	3
			Paper VI- Cell Science, Genetics, Biological Chemistry and Economic Zoology	3	--	--	100	70	30	3
	Core	Subject 2	Paper V	3	--	--	100	70	30	3
			Paper VI	3	--	--	100	70	30	3
	Core	Subject 3	Paper V	3	--	--	100	70	30	3
			Paper VI	3	--	--	100	70	30	3
Grand Total				**18**	--	--	**600**	**420**	**180**	**18**
Class :	**B.Sc.- II Semester - IV**									
	Ability Enhancement Course(AECC)	Environmental Science		4			100	70	30	4
	Core	ZOOLOGY 1	Paper VII- Animal Diversity -IV	3	--	--	100	70	30	3
			Paper VIII- Histology and Physiology	3	--	--	100	70	30	3
	Core	Subject 2	Paper VII	3	--	--	100	70	30	3
			Paper VIII	3	--	--	100	70	30	3
	Core	Subject 3	Paper VII	3	--	--	100	70	30	3
			Paper VIII	3	--	--	100	70	30	3
Total (Theory)				**22**	--	--	**700**	**490**	**210**	**22**
	Core	ZOOLOGY 1	Pr. II&III	--	--	8	200	140	60	8
	Core	Subject 2	Pr. II&III	--	--	8	200	140	60	8
	Core	Subject 3	Pr. II&III	--	--	8	200	140	60	8
Total (Practicals)						**24**	**600**	**420**	**180**	**24**
Grand Total				**22**		**24**	**1300**	**910**	**390**	**46**

General Guidelines for Choice Based Credit System (CBCS)

B.Sc. II - Details Course structure - w . e. f. 2017-18

1. The University follows Semester system

2. An academic year shall consist of two semesters

3. Each B.Sc. course shall consist of three years i.e. six semesters

4. Environmental Studies paper shall remain compulsory for B. Sc .Part- II students in IVth Sem.

4. B.Sc.Part-II shall consist of two semesters: Semester III and Semester IV.

In semester –III, there will be two theory papers of 100 marks for each subject. There shall be three optional science subjects. Similarly, in semester –IV there will be two theory papers of 100 marks for each subject. There shall be three optional science subjects and Environmental Studies paper compulsory for every student in semester IV.

The scheme of evaluation of performance of candidates shall be based on University assessment as well as College internal assessment as given below. For B.Sc.Part II Sem III & IV the internal assessment will be based on Unit tests, Home assignment, viva, practicals, Project Work etc as given below. Practical course examination of 200 marks for each subject shall be conducted at the end of IVth semester. The practical examination of 200 marks shall also consist of 140 marks for University practical assessment and 60 marks for college internal assessment.

The process of evaluation for Environmental Studies shall be based on University theory examination of 70 marks and 30 marks internal assessment. The internal assessment for environmental studies shall be based on internal test/ home assignment/tutorial of 10 marks and project work for 20 marks.

For University practical examination out of two examiners, one examiner will be internal and another examiner will be External. Both examiners will be appointed by the University. The internal practical assessment shall be done as per scheme given below.

5. **Scheme of evaluation:**

As per the norms of the grading system of evaluation, out of 100 Marks, the candidate has to appear for College internal assessment of 30 marks and external evaluation (University Assessment) of 70 marks. The respective B.O.S. may decide the nature of College internal Assessment after referring to the scheme given below or may be used as it is.

Semester - III:
Theory : (100 marks)
University Examination (70 Marks): No. of Theory papers: 2 Papers/Subject (Total 6 Papers)

Internal Continuous Assessment (30 Marks):

Scheme of Marking: 20 Marks: Internal Test
10 Marks: Home assignment/Tutorials/Seminars/ Group discussion/ Viva/Field visit/Industry visit.

Semester - IV: (100 marks)
Theory:
University Examination (70 Marks): No of Theory papers: 2 Papers/Subject (Total 6+1Papers)

Internal Continuous Assessment (30 Marks):
Scheme of Marking: 20 Marks: Internal Test
10 Marks: Home assignment/Tutorials/ Seminars/ Group discussion/ Viva/ Field visit/Industry visit.

Practical Examination:
University Examination (140 Marks**)**: No of Practicals: 1 Practical /Subject (Total 3 Practicals)

Internal Continuous Assessment (60 Marks):
Scheme of Marking: 40 Marks: Internal Test on any four practicals, 20 Marks: Lab Journal/viva, attendance, attitude etc. For Environmental Studies there shall be theory examination of 70 marks (UA) and 30 marks (CA) internal assessment. The internal assessment for environmental studies shall be based on internal test/ home assignment/tutorial of 10 marks and project work and report of 20 marks.

6. **Passing Standard**
The student has to secure a minimum of 4.0 grade points (Grade C) in each paper. A student who secures less than 4.0 grade point (39% or less marks, Grade FC/FR) will be declared fail in that paper (subject) and shall be required to reappear for respective paper. A student who failed in University Examination (Theory) & passed in internal assessment of a same paper (subject) shall be given FC Grade. Such student will have to appear for University Examination only. A student who fails in Internal Assessment and passed in University examination (Theory) shall be given FR Grade. Such student will have to appear for both University examination as well as internal assessment. In case of Annual Pattern/Old Semester Pattern Students/candidates from the mark scheme the candidates shall appear for the same 70 marks paper of the external examination and his performance shall be scaled to 100 marks

- **ATKT**

Candidate passed in all the papers except 4 (four) papers combined together of the semester I and Semester II of B.Sc. Part I examination shall be permitted to enter upon the course of Semester III of B.Sc.Part II

Solapur University, Solapur

Nature of Question Paper for Choice Based Credit System (CBCS) Semester Pattern, • Faculty of Science , B.Sc. II (w.e.f. 2017-18)

Time: - 3.0 hrs. **Total Marks- 70**

Q. No.1) Multiple choice questions (14)

1) ----------

a) b) c) d)

2)

3)

4)

5)

6)

7)

8)

9)

10)

11)

12)

13)

14)

Q.No.2) Answer any five (out of seven) of the following (14)

i)

ii)

iii)

iv)

v)

vi)

vii)

viii)

xi)

Q.No.3) A) Answer any two of the following (10)

i)

ii)

iii)

B) (4)

Q.No.4) Attempt any two of the following (14)

i)

ii)

iii)

iv)

Q.No.5) Attempt any two of the following (14)

i)

ii)

iii)

SOLAPUR UNIVERSITY, SOLAPUR

B.Sc.II-Zoology-
Choice Based Credit System (CBCS)
Syllabus

(w.e.f.-2017-18)

SEMESTER-III
THEORY

Paper	Title of the Paper	Marks
V	Animal Diversity -III	100 (70UA+30CA)
VI	Cell Science, Genetics, Biological Chemistry and Economic Zoology	100 (70UA+30CA)

SEMESTER-IV
THEORY

Paper	Title of the Paper	Marks
VII	Animal Diversity -IV	100 (70UA+30CA)
VIII	Histology and Physiology	100 (70UA+30CA)

PRACTICAL
TO BE TAKEN AT THE END OF SEMESTER-IV
Title of the practical

Practical I&II	Practical Based on Theory Papers V, VI, VII,VIII	**Marks** 200 (140UA+60CA)

UA- University Assessment
CA- College Assessment

SOLAPUR UNIVERSITY, SOLAPUR
B.Sc.II-Zoology –C B C S PATTERN
w.e.f. 2017-18
Semester-III
Paper-V- Animal Diversity III

Contact Hours:45

Total credits-3

Unit No.I	**Taxonomy:** Salient features and Classification up to classes of the following with suitable examples: Arthropoda, Mollusca, Echinodermata and Hemichordata	**05**
Unit No.II	**Type Study- 1. Cockroach (Phylum-Arthropoda)** i) Systematic Position ii) Habit and Habitats iii) External Morphology iv) Study of the following systems: a) Digestive system b) Respiratory system c) Circulatory system d) Nervous system and compound eye e) Excretory system f) Reproductive systems v) Economic importance	**15**
Unit No.III	**Type Study- 2. Pila (Phylum-Mollusca)** i) Systematic position ii) Habit and Habitats iii) External morphology: Shell and Pallial Complex iv) Study of following systems: a) Digestive system b) Respiratory system c) Blood Vascular System d) Nervous system and Sense organs-Eye, Osphradium, Statocyst e) Excretory system f) Reproductive systems v) Economic importance	**15**
Unit No.IV	**A)** Study of Insect mouth parts: Cockroach, Honeybee, House fly, Butterfly and Mosquito **B)** Mosquito as insect vector in human diseases with reference to : Malaria, Filaria, and Dengue disease (Prevention, Control measures and Treatment expected).	**05**
Unit No.V	a) Study of Foot in Mollusca b) Affinities in Hemichordata c) Amazing invertebrates – Offence and defence mechanism – Ink gland in Sepia Bioluminescence — Firefly	**05**

List of Recommende Books:

1) Arthropoda, Mollusca and Echinodermata-Kotpal R.L.(Series)
2) Mollusca- Morten J.E.

3) Echinodermata- Nichols D.
4) Invertebrate- Kotpal R.C.
5) Invertebarate Zoology- Jorden E.L. and Verma P.S.
6) Biology of Invertebrates – Russel – Hunter
7) The Text Book of Invertebrate Zoology – Shrivastava

Paper-VI- Cell Science, Genetics, Biological Chemistry and Economic Zoology

Contact Hours:45
Total credits-3

Unit No.I — **05**

Cell Science- a) Study of cell cycle ;
b) Study of Cell division: Mitosis and Meiosis
c) Specialized cell : Leucocytes (WBC) (with reference to - types , structure and functions)

Unit No.II — **03**

Genetics-
i) **Linkage:** Definition ,Complete linkage and Incomplete linkage with examples of *Drosophila*
ii) Mechanism of Crossing over and its Significance
iii)Gene interaction -
a) Supplementary genes
b) Complementary genes
iv) Human genetics : Human chromosomal disorders
a) Downs syndrome
b) Turners syndrome
c) Klinefelter syndrome

Unit No.III — **05**

Biological Chemistry- Biomolecules- (Definition, Structure, Types and Biological significance):
i) Carbohydrates
ii) Proteins
iii) Lipids
iv) Nucleic Acids (DNA and RNA)

Unit No.IV — **05**

Economic Zoology-
1) Economic Fishery
i) Fresh water Fish farming- Construction and Maintenance
ii) Economic importance of fishes
iii) Maintenance of glass aquarium and ornamental fishes

2) Sericulture — **05**
i) Types of Silk moth
ii) Morphology of mulberry silk moth
iii) Life cycle- Silk moth
iv) Rearing of silkworm
v) Economic importance

3) Apiculture — **05**
i) Types of honey bees and caste
ii) Honey comb
iii) Bee keeping- Modern methods , Instruments and appliances used in Apiculture
iv) Economic importance

Unit No.V — **02**

4) Dairy Science
i) Economics importance-Milk and Milk Products.

5) Poultry Science: **05**

i) Poultry breeds-Indigenous and exotic breeds
ii) Feeding
iii) Housing and Management
v) Food value- egg and meat
vi) Poultry diseases-Small pox and Ranikhet

6) Goat Farming

i) Breeds
ii) Feeding
iii) Housing
iv) Economic importance

05

List of Recommended Book :

1) The Cell-Bruce Albert
2) The Cell- De Roberties
3) Cell Biology-C.B. Power
4)The Cell-Cooper
5) Biochemistry – Lehninger A.L.
6) Biochemistry –Das
7) Biochemistry Vol I-Dasgupta S.K.
8) Biochemistry – Voet and Voet
9) Biochemistry – Stryer
10) Molecular biology – Gupta P.K.
11) Principles of Genetics – Gardner
12) Genetics – Strickberger
13) Cell biology, Genetics, Evolution – Verma Agrawal
14) Molecular Biology of the Gene – Watson J.D.
15) Fish Culture – K.H. Alikuhni
16) Fish Culture – Lagler
17) Hand Book of Animal Husbandary and Dairy –Mudlyer
18) Bee keeping in India – Sardar Sing
19) Bee Keeping in India – M.G. Smith
20) Poultry keeping in India – Naidu P.N.M.
21) Poultry Husbandry – M.A. Jule
22) Introduction to sericulture – Ganga and Shetty
23) The cell- Varute and Bhatia

Semester-IV
Paper-VII- Animal Diversity IV
Contact Hours:45
Total credits-3

Unit No.I	**Taxonomy:** Salient features and classification of Reptiles, Birds and Mammals up to orders with suitable examples	**05**
Unit No.II	**Type study: 1. Rat** i) Systematic position ii) Habit and Habitats iii) External Morphology iv) Study of following systems: a) Digestive system b) Respiratory system c) Circulatory system d) Excretory system e) Nervous system- Brain and Spinal cord f) Sense Organs – Eye and Ear g) Reproductive systems (Male and Female)	**20**
Unit No.III	**Study of general topics:** A. Mesozoic reptiles: Dinosaurs a) Aquatic : Ichthyosaurs and Plesiosaurs b) Terrestrial : Pterosaurs, Herbivorous (Brontosaurus) and Carnivorous (Tyranosaurus) B. Salient features and affinities: Monotremes and Marsupials C. Dentition in mammals: Introduction, Herbivorous, Carnivorous and Omnivorous with examples	**10**
Unit No.IV	**Poisonous and non-poisonous snakes:** a) Identification features with examples b) Poison apparatus c) Venom : its effects and medicinal uses d) Anti-venom production e) First aid treatment of Snake bite	**05**
Unit No.V	i) Archaeopteryx ii) Aerial adaptations in birds iii) Beak and Leg modification in birds iv) Migration in Birds	**05**

List of Recommended Books:

1) Rat : Rowett
2) Rat : Kshirsagar G.R.
3) T.B.of vertebrate Zoology-Prasad S.N.I
4) Vertebrates – Kotapal R.C.
5) Comparative vertebrate anatomy-Hyman L.H.

Paper-VIII- Histology and Physiology

Contact Hours:45
Total credits-3

Unit No.I **Study of Tissues** **05**

(Study of following tissues with reference to origin, location and functions)
i) Epithelial ii) Connective iii) Muscular iv) Nervous

Unit No.II **Histology of following mammalian organs:** **15**

i) Tooth ii) Tongue iii) Salivary gland iv) Stomach v) IIeum
vi) Liver vii) Pancreas viii) Kidney ix) Testis x) Ovary xi) Uterus

Unit No.III **Reproductive physiology:** **10**

i) Pituitary gland and its hormones
ii) Sex hormones
iii) Oestrous cycle
iv) Menstrual cycle
v)Hormonal control of pregnancy, parturition and lactation
vi) Hormonal control of testicular activity
vii) *In-vitro* fertilization
viii) Amniocentesis

Unit No.IV **Study of Contraceptives: Male and Female** **05**

i) Natural methods : Abstinence, Rhythm
ii) Mechanical methods: Condom, Diaphragms
iii) Chemical methods: Tablets , Creams
iv) Intra uterine device: Copper – T
v) Oral contraceptives – Pills
vi) Surgical methods : Tubectomy , Vasectomy

Unit No.V **Body defense mechanism-** **10**

A) Organs involved in immune system
a) Primary lymphoid organs : Bone marrow and Thymus
b) Secondary lymphoid organs: Lymph nodes , Spleen , Tonsil

B) Immune system
i) Humoral immunity and its mechanism
a) B-Cell Immunity
b) Typical structure of antibody and its types
ii) Cellular immunity and its mechanism
a) Types of T-Cell
b) T-Cell Immunity

List of Recommended Books:

1) Histology – Ham A.W.
2) Baileys's T.B. of Histology – Williams and Williams
3) An Atlas of Histology – Heineman Educational Book Ltd.London
4) Microscopic anatomy of vertebrates –Lea and Febigen, Philadelphia
5) Histology of Mammals – Atavale M.V. and Latey A.N.
6) Human physiology by Chatterjee C.C.
7) Physiology – A.C. Guyton

Practical Course in Zoology for B.Sc. II
Semester III and IV (Total Credits 2+2=4)
(Final practical examination to be conducted at the end of Semester IV)

Practical – I — Total credits-2

I. **Taxonomy**-
Classification with morphological peculiarities of the following up to classes.
a) Arthropoda- Apus, Balanus, Prawn, Lobster, King-crab, Grasshopper, Butterfly, Moth, Milleped, Centipede, Scorpion, Spider, Peripatus
b) Mollusca – Chiton, Dentalium, Patella, Aplysia, Snail, Slug, Mytilus, Pearl Oyster, Sepia, Octopus
c) Echinodermata – Sea-star, Brittle star, Sea-lilly, Sea urchin, Sea cucumber
d) Hemichordata – Balanoglossus

II. Study of Cockroach-
a) External characters and sexual dimorphism (CD/Model/Chart/ virtual)
b) Anatomical observation and detailed explanation of systems using CD/Model/Chart of
i) Digestive system
ii) Nervous system
iii) Male reproductive system
iv) Female Reproductive system
c) Anatomical observation and detail explanation of systems using CD/Model/Chart / virtual of
i) Walking leg
ii) Mouth parts
iii) Thoracic spiracles
iv) Salivary apparatus
v) Gizzard
vi) Cornea
vii) Trachea

III. Study of Pila-
A) External character- Shell, Pallial complex (CD/Model/Chart / virtual)
B) Anatomical observation and detailed explanation of systems using CD/Model/Chart of
i) Digestive system
ii) Nervous system
C) Observation and detail explanation using CD/Slide/Model/Chart/ virtual of
i) Osphradium
ii) Radula
iii) Statocyst

IV. **Study of mouth parts** of : Honey bee, Mosquito, Butterfly, Housefly using permanent slides/CD/Model/Chart

V. **Mosquito as disease vector** : Whole mounts of Anopheles, Culex, Aedis using permanent slides/CD/Model/Chart

VI. **Study of foot in mollusca** with reference to Chiton, Pila, Mytilus, Unio, Sepia/Octopus using museum specimens/CD/Model/Chart

VII. Study of mitosis using onion root tip

VIII. Study of WBCs (leucocytes) by blood smear staining technique and their identification .

IX. Examples in genetics (at least 10 examples): Examples based on Crossing over, Linkage and interaction of genes

X. Detection of Carbohydrates(Gulcose, Fructose, Maltose/Lactose, Starch), Proteins and Lipids.

XI. Colorimetric estimation of protein by biuret method

XII. Colorimetric estimation of glucose by suitable method

XIII. Study of Glass aquarium fishes using laboratory specimens/photographs/CD/videos (Any five fishes)

XIV. **Study of Apiculture** – Honey bee chamber , honey extractor ,decapping knife, mask , gloves , Honey, Bee wax , laboratory material/ model/ chart

XV. **Study of Sericulture** – Study of Silk moth, Silk cocoons, and Silk using laboratory specimens/material

XVI **Study of Dairy Science** – Study of Milk and Milk products using available material

XVII. **Study of Poultry Science**- Different kinds of Poultry birds, Eggs and Poultry manure using available laboratory specimens/material

Practical –II Total credits-2

I. **Taxonomy-**(Models/Photographs/Sketches)
Classification with morphological peculiarities of the following up to orders:
i) Reptiles – Turtle, Tortoise, Chamaeleon, Garden lizard, Crocodile
ii) Aves – Duck, Kite, Woodpecker, Sparrow, Sunbird, Vulture, Kingfisher, Fowl.
iii) Mammals - Platypus, Bat, Scaly anteater, Loris, Rabbit

II. **Study of Rat** : Anatomical observation and detailed explanation of the following system with CD/Model/Chart/Virtual of
i) Digestive system
ii) Respiratory system
iii) Arterial system
iv) Venous system
v) Excretory system
vi) Reproductive systems (Male and Female)

III. Anatomical observation and detailed explanation of brain of Rat with CD/Model/Chart/Virtual -

IV. Observation and detail explanation of following tissue with reference to structure , location and functions (with CD/Slide/Model/Chart)-

i) Epithelial ii) Connective iii) Muscular iv) Nervous

V. Study of Mesozoic reptiles (using chart/models/CD)

VI. Identification of the following poisonous and non poisonous snakes using laboratory specimens chart/model/lab specimens
i) Cobra ii) Russel's Viper iii) Indian little Viper (Phoorsa) iv) Krait v) Sea snake
vi) Rat snake vii) Sand boa

VII. Study of Beak and Leg modification in birds using laboratory specimens
i) Parrot ii) Woodpecker iii) Heron iv) Duck v) Sparrow/Pigeon vi) Hawk/Kite
viii) Owl ix) Vulture

VIII. Study of dentition in mammals using laboratory materials/models/CD of:
Sheep, Rat, Rabbit, Dog, Man

IX. Study of histological structure (T.S./V.S.) of the following mammalian organs using permanent slides:
i) Tooth ii) Tongue iii) Salivary gland iv) Stomach v) IIeum
vi) Liver vii) Pancreas viii) Kidney ix) Testis x) Ovary xi) Uterus

X. Study of Oestrus cycle using CD/Chart/Permanent slides

XI. Study of following abnormal urine constituents: Glucose, Bile, Blood and Albumin

XII. Study of ABO blood group system and blood group antigens

XIII. Study of following contraceptives: Oral contraceptives (pills), Intra-uterine device, Condom using chart/photographs.

XIV Methods and techniques of bird watching and in campus field visit to record avifaunal diversity .

Excursion Tour : Six days tour is recommended

As a part of practical, visit to sea-shore/any suitable place of Zoological interest (Visit to sea-shore, Fishery Centers, National Parks, Wildlife Sanctuaries, National Research Institutes, Central Research Institutes, Zoological Survey of India, Fresh Water Ecosystem etc. to study animal diversity and economic Zoology. A report is to be submitted at the time of Practical examination.

OR

Review of article (research / magazine /news paper) based on syllabus of semester III and IV and submission of report / project

Note:

As per the guidelines of **UGC notification number F.14-6/2014(CPP-II) dated 1st August, 2014** it is now essential to make necessary modifications to stop dissection and promote and orient students towards the knowledge component rather than skill development. However, ITC based virtual dissections are promoted. Now, the responsibility to discontinue dissections and use of animals in experiments totally rests on concerned authorities of respective colleges/Institutes. As per the notification it is important to encourage the field trips and observations without disturbing the biodiversity.

Equivalence of the new CBCS Course

S No	Title of old CGPA Paper	Title of New CBCS Paper
1	Paper III : Animal Diversity -III	Paper V: Animal Diversity -III
2	Paper IV :Cell Science, Genetics, Biological Chemistry and Economics Zoology	Paper VI :Cell Science, Genetics, Biological Chemistry and Economics Zoology
3	Paper V :Animal Diversity -IV	Paper VII : Animal Diversity -IV
4	Paper VI : Histology and Physiology	Paper VIII :Histology and Physiology

Distribution of Marks for Practical Examination in B.SC.II-Zoology
[Total Marks-200 (UA-140+CA-60)]

PRACTICAL I :

Q.1	Analysis and explanation of anatomical part of given figure/CD/Chart/Model of Cockroach & *Pila*	Marks 12
Q.2	Analysis and explanation of anatomical part of given figure/CD/Chart/Model of Cockroach & *Pila*	Marks 08
Q.3	Cytological preparation of mitosis/W.B.C. Study by Staining technique	Marks 10
Q.4	Genetics example	Marks 10
Q.5	Biochemical tests/Estimations of protein/glucose	Marks 10
Q.6	Identification/Spotting	Marks 10
Q.7	Journal (Practical Record Book)	Marks 10

Total Marks 70

PRACTICAL II:

Q.1	Analysis and explanation of anatomical part of given figure/CD/Chart/Model of brain of Rat	Marks 12
Q.2	Analysis and explanation of given figure/CD/Chart/Model of –various tissues(epithelial/connective/muscular/nervous)	Marks 08
Q.3	Detection of abnormal constituents of urine	Marks 10
Q.4	Study of oestrus cycle by using chart /Blood group antigens detection	Marks 10
Q.5	Submission of excursion report/ article review report or project and viva based on it	Marks 10
Q.6	Identification/Spotting	Marks 10
Q.7	Journal (Practical Record Book)	Marks 10

Total Marks 70