

Based on [Papers: I - Invertebrates: Structure and Function & II - Biosystematics, Taxonomy and Evolution]

LCW-I: (LC-I: Invertebrates: Structure and Function; LC-II: Biosystematics, Taxonomy and Evolution)

Centre:

Batch No.:

Date:

Time: 11:00AM to 05:00 PM

Exam. Seat Number:

Credits: 03 (75 Marks)

Q.1. Demonstrate crab/earthworm/cockroach so as to expose fully its Digestive/ Reproductive/ (15)
Nervous system and leave a well labeled diagram.

OR

Prepare a permanent micro preparation of nephridium or spermatheca of earthworm / trachea of cockroach /gills of crab.

OR

Mounting of larvae (Any One) of insects / crustacea

Q.2 Identify Museum specimens 1-5 from invertebrate phyla: Salient characteristics, (15)
identification and classification of invertebrate groups

OR

Identify and Describe the larval forms all major phyla of Invertebrates (Any Three)

OR

Study of the following specimen to bring out their affinities- *Balanoglossus* / *Cephalodiscus*.

Q.3. Composition assessment of taxonomic diversity/Bio-diversity in Grassland/ Wetland/ forest (15)
habitat

OR

Comment on the use of Animal collecting equipment's. (Any three)

OR

Collection of Insects, Spreading, Pinning and Studying of Insects.

OR

Methods of collection, preservation and identification of plankton/ representative forms of terrestrial/ aquatic fauna.

Q.4. Study of Local Fauna- Collection & Preservation of Animals. (15)

OR

Comment on taxonomic grouping, characters (Invertebrate 02 spots, Vertebrate 03 spots)
[spots 1 – 5]

OR

Museum preservation techniques of selected vertebrates/ invertebrates.

OR

Study of fossils/connecting links (01 Spot)/ Homologous Organs (01 Spot) / Analogous
Organs (01 Spot).

Q.5. Submission of Stained Micro preparation, Insects/ Animal collected and Practical Record (10)
book.

Q.6. Viva-voce. (05)

Note: Demonstration of Dissections through Models, Charts and Computer Aided Techniques as per U.G.C. Guidelines.

Name & Signature
Examiner – 1

Name & Signature
Examiner – 2

Swami Ramanand Teerth Marathwada University, Nanded

Faculty of Science and Technology

CHOICE BASED CREDIT SYSTEM (NEW CBCS) w.e.f. June 2019

M.Sc. Practical Examination – (First Year, Semester - I)

ZOOLOGY Laboratory Course Work-II

Based on Paper: III - Economic Zoology and Animal Behaviour

IV-(Elective): Quantitative Biology and Bio-informatics]

LCW-II: (LC-III: Economic Zoology and Animal Behaviour; LC-IV (Elective): Quantitative Biology and Bio-informatics)

Centre:

Batch No.:

Date:

Time: 11:00AM to 05:00 PM

Exam. Seat Number:

Credits: 03 (75 Marks)

Q.1. Identify, comment on parasitic protozoans 01 Spot, helminthes 02 Spot, food fishes 01 Spot, (15)
Mollusca 01 Spot [spots 1 – 5].

OR

Study of – Social organization of Honey bees/ Life cycle of Honey bee & Hive / Mosquito Life cycle.

OR

Study of life cycle of Silk moth/Study of Vermiculture.

Q.2 Study of Positive/ Negative phototaxis/To study the habituation to light stimulus/ Distribution (15)
of light stimuli in the earthworm *Pheritima*/ To demonstrate photo tactic and geotactic responses of the animal provided (House fly *Musca domestica*)/Study of Positive/Negative Chemotactic Response with suitable examples/ Righting response in crab or any other animal.

OR

Study of Communication in invertebrates and vertebrates (Terrestrial/ Aerial/ Aquatic habitats) /

Study of Ecological aspects – Food selection & optimal foraging/Prey and predator/ Host-Parasite relationship /

Social behaviour – Aggregation – In fishes/ birds/ mammals/ social organization in insects/ Reproductive behaviour – mating systems/ sexual selection/ parental care in animals.

Q.3. Study of Classification of data / Preparation of Histogram, Bar Diagrams & Pie Chart/ (15)
Drawing Graphs and Tables on Computer./
Problems based on Mean, Median and Mode/ Standard Deviation/ Correlation/
Graphic representation of Data- Tables, Graphs, Scatter plots.

Q.4. Searching given nucleotide sequence in a database using BLAST and reporting the results/ (15)
Comparison of given nucleotide sequences and reporting the results/
Searching, downloading and visualizing a protein structure file/
Comparison of given protein sequence files and reporting the results.
Searching a given metabolic pathway and visualizing it/
Searching biological information about a given gene sequence in an online database and report/
Searching biological information about a given protein in an online database and report.

Q.5. Submission of Excursion report and Practical Record book. (10)

Q.6. Viva-voce. (05)

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CHOICE BASED CREDIT SYSTEM (NEW CBCS) w.e.f. June 2019

M.Sc. Practical Examination – (First Year, Semester - I)

ZOOLOGY Laboratory Course Work-II

Based on Paper: III - Economic Zoology and Animal Behaviour

IV- (Elective): Conservation Biology]

LCW-II: (LC-III: Economic Zoology and Animal Behaviour; LC-IV (Elective): Conservation Biology)

Centre:

Batch No.:

Date:

Time: 11:00AM to 05:00 PM

Exam. Seat Number:

Credits: 03 (75 Marks)

- Q.1. Identify, comment on parasitic protozoans 01 Spot, helminthes 02 Spot, food fishes 01 Spot, (15)
Mollusca 01 Spot [spots 1 – 5].

OR

Study of – Social organization of Honey bees/ Life cycle of Honey bee & Hive / Mosquito Life cycle.

OR

Study of life cycle of Silk moth/Study of Vermiculture.

- Q.2 Study of Positive/ Negative phototaxis/To study the habituation to light stimulus/ Distribution (15)
of light stimuli in the earthworm *Pheritima*/ To demonstrate photo tactic and geotactic responses of the animal provided (House fly *Musca domestica*)/Study of Positive/Negative Chemotactic Response with suitable examples/ Righting response in crab or any other animal.

OR

Study of Communication in invertebrates and vertebrates (Terrestrial/ Aerial/ Aquatic habitats) /

Study of Ecological aspects – Food selection & optimal foraging/Prey and predator/ Host-Parasite relationship /

Social behaviour – Aggregation – In fishes/ birds/ mammals/ social organization in insects/ Reproductive behaviour – mating systems/ sexual selection/ parental care in animals.

- Q.3. Study of Collection and preservation of fauna/Sampling Techniques (Transect/ quadrat (15)
method)/ Use of Identification of keys – reference specimen/
Wildlife photography and documentation of locally occurring wild species of animals/
Remote sensing GIS and their modules for conservation.

- Q.4. Study of status of Any Three given species in IUCN Red List Exercise/ VORTEX/ SIS/ (15)
Problems based on Statistical analysis – Shannon Weiner Index, Simpson's index, Species richness and evenness/

Museum study of Vertebrate Endangered Species or Threatened Wild Animals on the Basis of charts/ models/ photographs (Any Three)/

Survey/Study of local/nearby natural habitat and reporting of its biodiversity and health status

- Q.5. Submission of Excursion report (Fish Breeding Farm/ wild life sanctuaries/ National parks/ (10)
Local biodiversity album) and Practical Record book.

- Q.6. Viva-voce. (05)

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Faculty of Science and Technology

CHOICE BASED CREDIT SYSTEM (NEW CBCS) w.e.f. June 2019

M.Sc. Practical Examination – (First Year, Semester - II)

ZOOLOGY Laboratory Course Work-III

Based on [Papers: VI - Animal Ecology, Toxicology and Environmental Pollution &
VII - Gamete Biology and Animal Development]

LCW-III: (LC-VI: Animal Ecology, Toxicology and Environmental Pollution; LC-VII: Gamete Biology and Animal Development)

Centre:

Batch No.:

Date:

Time: 11:00AM to 05:00 PM

Exam. Seat Number:

Credits: 03 (75 Marks)

Q.1. Estimation of pH/ Dissolved oxygen/ Carbon di-oxide/ Carbonates and Bicarbonates in water (15)
samples./

Study of Population Growth by model assumption and problems./

Estimation of Carbonate or Nitrate from the soil sample./

Estimation of Sulphate or Phosphate in the water sample./

To Study Animal Association - parasitism, mutualism and commensalisms (One from Each).

Q.2 To Study Ecological Adaptations (One examples from each) a) Volant Adaptations; b) (15)
Aquatic Adaptation (from fresh water and marine environment); c) Desert Adaptation.

OR

To study the effect of pollutant on heart beat on given animal (Crab/Fish/ Daphnia)/

Estimation of Chlorides & Salinity/Hardness from given water sample./

Determination of LC50 in relation to any toxicant in given aquatic animal./

Study of rate of oxygen consumption by aquatic animals under environmental stresses.

Q.3. Histological study of different stages of Gametogenesis./ (15)

Physical and chemical examination of semen/

Microscopic examination of semen/

Histological study of gonads of Frog *or* Rat./

Demonstrate Leech / Rat so as to expose its reproductive system and leave a well labeled
diagram./

To Study of types of eggs

Q.4. Estimation of calcium in egg shell by EDTA method/ (15)

Staining & Mounting of Chick embryos of different hours (whole mount)/

Comment on spots 1 to 5. Chick embryos of different hours (02 Spot), L.S/ T.S. of chick
embryo through head and heart regions (01 Spot); developmental stages of Frog (01 Spot);

Metamorphosis of Insects (01 Spot)./

Experiments in regeneration in Hydra or Planaria.

Q.5. Submission of Excursion report, Stained Permanent Micro preparation and Practical Record (10)
book.

Q.6. Viva-voce. (05)

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Based on Paper: VIII- Biochemistry and Immunology; IX (Elective*)- Tools and Techniques for Biology]
LCW-IV: (LC-VIII: Biochemistry and Immunology; LC-IX (Elective): Tools and Techniques for Biology)

Centre:

Batch No.:

Date:

Time: 11:00AM to 05:00 PM

Exam. Seat Number:

Credits: 03 (75 Marks)

- Q.1.** Determination of Glycogen/ Glucose/ Lipids/ Cholesterol from Provided sample / (15)
Separation of Proteins by Electrophoresis from provided sample /
Estimation of SDH & LDH activity/ Free Amino Acids / Proteins/Urea/Uric Acid.
Routine examination of urine (Physical / Chemical / Microscopic examination of urine)/
Determination of specific gravity of urine by urinometer or refractometer/
Estimation of an Enzyme – Amylase/ Protease/ Acetylcholine Esterase (AChE) activity.
- Q.2** Identification of Blood Groups: A, B, AB, O with Rh factor./ (15)
To Study Differential Leucocytes Count (DLC)./
Identification of histological slides of lymphoid tissue (Any Three) – (Spleen, thymus, lymph node and bone marrow.) /
Preparation and Observation of Bone Marrow Smear. /
Testing given sample using ELISA (Enzyme Linked Immuno Sorbent Assay)/Tridot method.
- Q.3.** Cleaning and Overhauling of Microscope/ (15)
Explain principle, Working Operation and Application of Any One type of microscope.
Fixing, embedding and block preparation of given tissue. /
Section cutting of given tissue blocks using a microtome/
Staining and mounting of given tissue sections. /
Explain principle, Working Operation and Application of distillation plant/Oven/Incubator.
- Q.4.** Separation of pigments /Amino Acids from tissue extracts/Provided sample by (15)
chromatography. /
Separation of Proteins using Gel Electrophoresis./
Principles, Uses and Working Mechanism of High Performance Liquid Chromatography (HPLC)./
Centrifugation of given sample using a laboratory centrifuge.
Colorimetric estimation of Protein / Glucose from given tissue sample.
- Q.5.** Practical Record book. (10)
- Q.6.** Viva-voce. (05)

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Time: 11:00AM to 05:00 PM

Exam. Seat Number:

Credits: 03 (75 Marks)

- Q.1.** Determination of Glycogen/ Glucose/ Lipids/ Cholesterol from Provided sample / (15)
Separation of Proteins by Electrophoresis from provided sample /
Estimation of SDH & LDH activity/ Free Amino Acids / Proteins/Urea/Uric Acid.
Routine examination of urine (Physical / Chemical / Microscopic examination of urine)/
Determination of specific gravity of urine by urinometer or refractometer/
Estimation of an Enzyme – Amylase/ Protease/ Acetylcholine Esterase (AchE) activity.
- Q.2** Identification of Blood Groups: A, B, AB, O with Rh factor./ (15)
To Study Differential Leucocytes Count (DLC)./
Identification of histological slides of lymphoid tissue (Any Three) – (Spleen, thymus, lymph node and bone marrow.) /
Preparation and Observation of Bone Marrow Smear. /
Testing given sample using ELISA (Enzyme Linked Immuno Sorbent Assay)/Tridot method.
- Q.3.** Estimation of blood glucose /Measurement of Blood Pressure. / (15)
Identification, classification and description of Protozoan & Helminth Parasites through permanent slides/photomicrographs or specimens (Any Five)- (*Plasmodium vivax*, *Entamoeba histolytica*, *Trypanosoma gambiense*, *Leishmania donovani*, *Trichomonas vaginalis*; *Schistosoma haematobium*, *Taenia solium*, *Ascaris lumbricoides*, *Wuchereria bancrofti*.) /
Collection, staining, identification and description of Parasitic protozoa from Blood sample of Human/ suitable animals- (Flagellates/Malarial parasites/Coccidian Parasites)/
Collection, Preservation, Staining, Mounting, identification and description of Parasitic Helminths from locally available host.
- Q.4.** Identification, classification and description of arthropods through permanent slides/ (15)
photographs (Any Five)- (*Aedes*, *Culex*, *Anopheles*, *Pediculus humanus*, *Xenopsylla cheopis*, *Cimex lectularius*, *Phlebotomus argentipes*, *Musca domestica*)/
Collection, preservation, Preparation of permanent slides and description of mouth-parts of – (House fly/ Mosquito/ Bed bug/ Head louse.)/
Estimation of total Proteins/Carbohydrates/ Lipids in Human blood sample/
Estimation of total Proteins/Carbohydrates/Lipids in Helminths/
Blood smear preparation and identification of lymphocytes/
Estimation of Haemoglobin in Human blood sample.
- Q.5.** Submission of Slides and Practical Record book. (10)
- Q.6.** Viva-voce. (05)

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