

Shiksha Mandal's
Bajaj College of Science, Wardha
(An Autonomous College)
Department of Zoology
Syllabus for B.Sc. Zoology (Semester Pattern)
Credit Based System
Academic Session 2019-20

B.Sc. Semester VI

Paper VI :- Animal Physiology, Bioinformatics and Biostatistics

UG-ZOO(07)-S6-T

UNIT I : (12 Periods)

- 1.1 Respiration: Structure of respiratory organs: Gills and Lungs
- 1.2 Transport of gases: O₂ and CO₂ Transport, Haemoglobin
- 1.3 Circulation: Blood : Definition and its constituents, functions of blood.
- 1.4 Heart : Cardiac cycle.

UNIT II:- (12 Periods)

- 2.1 Muscle Physiology: Types of Muscles: striated, non-striated and cardiac muscles
- 2.2 E.M. Structure and Chemical Composition of striated muscle. Mechanism of muscle contraction by Sliding filament theory.
- 2.3 Nerve Physiology: Neuron: E.M. Structure of neuron and Types : Myelinated and non-Myelinated nerve fibres, saltatory nerve conduction.
- 2.4 Synapse and synaptic transmission (with acetyl choline as an example)

UNIT III:- (12 Periods)

- 3.1 Nutrition and Digestion: Structure and functions of digestive system and associated glands;
- 3.2 Digestion and absorption of proteins, carbohydrates and lipids.
- 3.3 Excretion: Structure of Uriniferous tubule ; Mechanism of urine formation ;
- 3.4 Concept of Ammonotelic, Ureotelic, Uricotelic animals.

UNIT IV :- (12 Periods)

- 4.1 Endocrine system: Hormones and its classification
- 4.2 Structure & Functions of Endocrine Glands : Pineal Gland, Hypothalamus,
- 4.3 Pituitary Gland, Thyroid Gland, Parathyroid Gland,
- 4.4 Adrenal Gland, Islets of Langerhan's

UNIT V :- (12 Periods)

- 5.1 Reproductive Physiology: Estrous and menstrual cycle,
- 5.2 Hormonal control of Reproduction in males and female,
- 5.3 Structure and Physiology of Human Placenta
- 5.4 Physiology of Lactation

UNIT VI :- Bioinformatics and Biostatistics

(12 Periods)

- 6.1 Bioinformatics: Definition, Basic concepts in bioinformatics, importance and role of bioinformatics in life sciences
- 6.2 Bioinformatics databases- introduction, types of databases
- 6.3 Biostatistics – Tabulation of data, presentation of data, sampling errors,
- 6.4 Mean, Mode, Median, Standard error and Standard deviation

Practicals:-

UG-ZOO(07)-S6-P

1. Estimation of hemoglobin percentage with the help of haemometer.
2. Preparation of Haemin crystals.
3. Measurement of blood pressure.
4. Action of salivary amylase on starch.
5. Qualitative detection of nitrogenous waste products (Ammonia, urea, uric acid) in given sample.
6. Estimation of glucose by O-toluidine method.
7. Qualitative analysis of carbohydrate, lipid and protein.
8. Field Report / Diary on disorders / Diseases observe in your surrounding (Survey Report)

Study of histological slides of Mammal – T.S. kidney, pituitary, thyroid, adrenal, testis, ovary; uterus, placenta, medullated and non medullated nerve fiber, smooth and striated muscle

Section B : (Behavior, Bioinformatics and Biostatistics)

1. Study of Food preference in Insects
2. Separation of amino acids by paper chromatography .
3. Separation of proteins by electrophoresis technique .
4. Determination of mean, mode, median, SE, SD from a given biostatistical data.
5. Graphical representation of the data using computers .
6. Retrieval of gene sequences from gene Bank.

Distribution of Marks –

| | Total Marks 30 |
|--|-----------------------|
| 1. Physiological Expt. | 06 |
| 2. Spotting (A To D) | 08 |
| 3. Analysis of given biostatistical data | 04 |
| 4 Submission of Diary | 04 |
| 5. Class record | 04 |
| 6. Viva - voce | 04 |

Reference Books

1. Prosser and Brown - Comparative Animal Physiology
3. Guyton - Physiology
4. Best and Taylor - Physiological basis of Medical practice
5. C Hoar, W.S. - General and comparative Physiology. Prentice Hall of India.
6. Lehninger. L. - Biochemistry. W.H. Freeman & co.
7. Nagabushnam, R. - Animal physiology, S.Chand & co.
8. Martin, D.W. P.A. Mayes and W.W. Rodwell - Harper's Review of Biochemistry Lange Medical Publications.
9. Prosser, C.L. and F.A. Brown - Comparative Animal physiology. W.B. Saunders.
10. Rama Rao, A.V.S.S. - Biochemistry. UBSPD.
11. Stryer. L. - Biochemistry Wiley International
12. Verma, P.S. and V.K. Agarwal. - Animal physiology. S.Chand & co.
13. Wilson, J.A. - Principles of Animal Physiology, Macmillan
14. Chatterjee, C.J. - Human Physiology (Vol-I and II)

Biotechniques, Bioinformatics and Biostatistics

1. Upadhyay, Upadhyay and Nath - Biophysical Chemistry -
2. D. B. Tembhare - Techniques in Life Sciences -
3. Mount W. 2004. - Bioinformatics and Sequence Genome Analysis 2nd Edition CBS Pub. New Delhi.
4. Bergman, N. H. - Comparative Genomics. Humana Press Inc. Part of Springer Science+Business Media, 2007.
5. Baxevanis, A. D. Ouellette, B. F. F. 2009. - Bioinformatics: A Practical Guide to the Analysis of Genes and Proteins. John-Wiley and Sons Publications, New York.
6. Campbell A. M. and Heyer, L. J. 2007 - Discovering Genomics, Proteomics and Bioinformatics, 2nd Edition. Benjamin Cummings.
7. Des Higgins and Willie Taylor 2000 - Bioinformatics: Sequence, Structure and Databanks. Oxford University Press.
8. Rashidi H. H. and Buehler 2002 - Bioinformatics Basics: Applications in Biological Science and Medicine, CRC Press, London.
9. Gibas Cynthia and Jambeck P. 2001 - Developing Bioinformatics Computer Skills: Shroff Publishers and Distributors Pvt. Ltd. (O'Reilly), Mumbai.