

SECOND YEAR TDC SCIENCE, 2018-19

ZOOLOGY - PRACTICAL

Duration : 5 Hrs.

M.M. :75

<u>S.No.</u>	<u>Exercise</u>	<u>Regular</u>	<u>Ex-Students</u>
1	Major dissection	18	25
2	Minor dissection/	09	12
3	Mounting/Applied Zoology exercise	08	08
4	Spots	20	20
5	Viva-voce	10	10
6	Record	10	--
Total :-		75	75

Major Dissection marks will be given only if virtual dissection is available otherwise marks may be given according to availability of dissection alternate.

General survey of Vertebrates (Museum specimens)

- A Urochordata : *Ciona, Pyrosoma, Doliolum, Salpa,*
- B Cephalochordata : *Amphioxus*
- C Agnatha : *Petromyzon, Ammocoete larva*
- D Pisces : *Echeneis, Sphyrna, Torpedo, Pristis, Labeo, Clarias, Anabas, Hippocampus (male and female), Chimaera, Anguilla, Protopterus.*
- E Amphibia : *Ichthyophis, Axolotl larva, Salamander, Bufo, Rana, Hyla, Pipa, Amphiuma, Alytes.*
- F Reptilia : *Testudo, Trionyx, Hemidactylus, Draco, Calotes, Chamaeleon, Varanus, Phrynosoma, Heloderma, Naja, Vipera, Typhlops, Bungarus, Hydrophis, Eryx, models of Dinosaurs.*

- G Aves : *Columba, Psittacula, Passer, Bubo*, model of *Archaeopteryx*
- H Mammalia : *Pteropus, Rhinopoma, Felis, Erinaceus, Hystrix Crocedura, Manis.*

PREPARED SLIDES :

- 1 Cephalochordata : *Amphioxus*: T.S. through buccal region, T.S. through pharynx showing gonads, T.S. through caudal region.
- 2 Pisces : Placoid, cycloid and Ctenoid scales, V.S. of skin.
- 3 Amphibia : V.S. of skin, T.S. of testis, T.S. of kidney and T.S. of liver.
- 4 Reptilia : V.S. of skin and T.S. of stomach.
- 5 Aves : T.S. of intestine, T.S. of liver, T.S. of ovary, filoplume W.M.
- 6 Mammalia : T.S. of pancreas, T.S. of thyroid gland, L.S. of pituitary gland, T.S. of stomach, T.S. of intestine, L.S. of kidney, T.S. of testis and ovary and V.S. of skin, T.S. of lung.

PERMANENT PREPARATIONS: Unstained placoid scales, spicules of *Herdmania*.

DISSECTION (Virtual): Virtual dissection will be done (if facility of virtual is made available by University)

Herdmania : Neural complex.

Scoliodon : Alimentary canal, scroll valve *in situ*, afferent and efferent branchial arteries, eye muscles, internal ear.

Digital animals : Arterial, venous and urino-genital systems.

OSTEOLOGY :

Identification of disarticulated skeleton of *Rana*, *Varanus*, *Gallus* and *Oryctolagus*. Palates of birds.

GENETICS:

Drosophila : Life cycle and its culture. Identification of wild and mutant *Drosophila*.

APPLIED ZOOLOGY:

- 1 Identification of different stages (from egg to adult) of silkworm.
 - 2 Tools used in silk worm rearing.
 - 3 Mounting of mouth parts and sting apparatus of honey bee.
 - 4 Identification of cultivable varieties of shell fish and fin fish.
 - 5 Gram staining of microbes.
- The teacher concerned will provide e-materials to practical in the form of video or demonstrations or written materials including dissections.

REFERENCE BOOKS (LATEST EDITIONS):

LIFE AND DIVERSITY OF ANIMALS (VERTEBRATES)

- 1 Ayyar, E.K. and T.N. Ananthakrishnan, Manual of Zoology, Vol.II (Chordata), S.Viswanathan (Printers and Publishers) Pvt. Ltd. , Madras.
- 2 Jordan, E.L. and P.S.Verma, Chordate Zoology and Elements of Animal Physiology, S. Chand & Co. Ltd., Ram Nagar, New Delhi (English and Hindi Editions).
- 3 Parker and Haswell, Text Book of Zoology, Vol.II (Chordata), A.Z.T.B.S. Publishers and Distributors, New Delhi- 110051.
- 4 Waterman, Allyn J. et.al., Chordate Structure and Function, Mac Millan and Co., New York.
- 5 Kotpal, RL, Modern Text Book of Zoology- Vertebrates, Rastogi Publications, Meerut (English and Hindi Editions).
- 6 Ganguly, BB, Sinha, AK and Adhikari, S : Biology of Animals, Vol.II, New Central Book Agency (P) Ltd. Kolkatta.
- 7 Alexander, R.M.: The Chordates (Cambridge University Press).
- 8 Monielth, A.R: The Chordates (Cambridge University Press).
- 9 Young, J.Z : Life of Vertebrates (Oxford University PressL)
- 10 Waterman, A.J: Chrodata - Structure and Function (Macmillan Co.).

GENETICS AND BIOTECHNOLOGY:

- 11 Verma, P.S. and V.K.Agarwal, Genetics, S.Chand & Co.
- 12 Lewis, C.D. and Lewin, R., Biology of Gene, McGraw Hill, Toppan Co. Ltd.
- 13 Gunther S. Stent, Molecular Genetics, macmillan Publishing Co. Inc.
- 14 Goodenough, V., Genetics, New York Holt, Rinchart and Winston.
- 15 Gardner, Principles of Genetics, Wiley Eastern Pvt., Ltd.
- 16 Winchester, Genetics, Oxford IBH Publications

- 17 Stickberger, Genetics, MacMillan Publications.
- 18 Pai, A.C., Foundations of Genetics, McGraw Hill Publications.
- 19 R.A.Meyers (Endocrinology.): Molecular Biology and Biotechnology, VCH Publishers.
- 20 Glick : Molecular Biotechnology.
- 21 R.W.Old and S.B. Primrose: Principles of Gene Manipulation and Introduction to Genetic Engineering.
- 22 Gupta PK : Elements of Biotechnology, Rastogi Publications, Meerut.

APPLIED ZOOLOGY AND MICROBIOLOGY :

- 23 Jhingran, VG, Fish and Fisheries of India. Hindustan Publishing Corporation, New Delhi.
- 24 Kovaleve, PA, Silkworm Breeding Stocks, Central Silk Board, Merine Drive, Bombay.
- 25 Roger, A. Morse, The ABC and XYZ of Bee Culture, A.I. Root and Co., Medina, Ohio 44256.
- 26 Metcalf CL and WP Flint, Destructive and Useful Insects, Tata McGraw Hill publishing Co. Ltd., New Delhi- 110051
- 27 Sharma PD, Microbiology, Rastogi Publications Meerut.
- 28 Shukla and Upadhyaya : Economic Zoology (Rastogi Publishers)
- 29 Venkitaraman : Economic Zoology (Sudarshana Publishers)

PRACTICAL:

- 30 Verma, PS, A manual of practical Zoology Vertebrates S.Chand and Co. Ltd., Ram Nagar, New Delhi (English and Hindi Editions).
- 31 Lal, SS : Practical Zoology Vertebrates, Rastogi Publication, Meerut (English and Hindi Editions).