SEMESTER – III

Zoo 301: Animal Biotechnology and Microbiology

UNIT-I

1.1. General Introduction and Achievements of Biotechnology
Genetic Engineering and r-DNA technology (Restriction endonucleases, DNA ligases, Topoisomerases, Methylases, Nucleases, Polymerases, Reverse transcriptase and their Properties and functions).

1.2. Cloning vectors (plasmids, Bacteriophages, Cosmids, Yeasts Shuttle vectors) used in Gene cloning.

1.3.Cloning Strategies and Screening Analysis of recombinants (Single colony hybridization Technique), immunologic test and site directed mutagenesis

UNIT-II

2.1 Application of biotechnology to Animal health and disease diagnosis.
Transgenicanimals: Production of transgenic fish, birds, mice, pigs, sheep, goat and cows,

2.2 Reproduction technologies: Artificial insemination, in vitro fertilization, Embryo Transfer technology, Pregnancy diagnosis, superovulation and Artificial womb.

2.3Application of Biotechnology in Medicine: Production of monoclonal antibodies (Hybridoma Technology), Production of vaccines and Production of Growth Hormone.

2.4Biotechnological applications of Aquaculture: Ploidy manipulations in fishes-gynogenesis, androgenesis, sex reversal in fish and Pearl culture.

UNIT-III

3.1 History and Scope of Microbiology

3.2 Microbial nutrition, growth and their control

3.3Normal microbial flora of Human Body- Skin, Nose, Oral cavity, Pharynx,Respiratory tract, Eye, Ear, Stomach, Intestine, Genitourinary tract.

3.4Microbial diseases and their control

a) Bacterial diseases - Tuberculosis, Plague, Anthrax.

b) Viral diseases - Influenza, AIDS, Hepatitis and COVID-19 (Corona virus).

UNIT-IV

4.1Microbiology of fermented food: Diary Products, Meat and Fish, microorganismsas Sources of feed

4.2Industrial Microbiology: Types of fermentation process, Types of fermenters,Downstream processing, Alcoholic beverages

4.3Manufacture of various chemicals: Lactic acid, and Citric acid.

4.4Therapeutic compounds: Antibiotics (penicillin), Industrial enzymes (Amylase,).

SUGGESTED READING MATERIAL:

1. A text book of Biotechnology-RC. Dubey.S.Chand & Company Ltd., New Delhi - 1996.
2. A text book on Biotechnology-(n Ed.) H.D. Kumar. EWP - Private Ltd., New Delhi - 1998.
3. Animal Biotechnology-M.M. Ranga, Agrobios (India), 2000.
4. Biotechnology-Fundamentals & Applications-S.S .Purohit & S.K. Mathur, Agro Botonics-1999.
5. Biotechnology-V. Kumaresan. Saras Publication-1994.
6. C.M. Presscots, J.P. Harley & D.AKlein Mc Graw Hill. WCB Publication 4th Edition.
7. Elements of Micro biology, by MJ. Pelzar, Jr & E.C.S Chan International students Edition, 1981, MCGRA WHill international Book Company, New Delhi. Microbiology
8. General Microbiology by C.B. Powar & H.F. Daginawala 1^{5t} Edition, Himalaya Publishing House, Bombay, 1982.
9. Text Book of Microbiology, by R Aananthnarayan &C.K. Jayaram Panikar, 4th Edition, Orient Longmen, Hyderabad, 1990.

Zoo-305P-PRACTICALS OF ANIMAL BIOTECHNOLOGY AND MICROBIOLOGY

1. Bacterial transformation and identification of transformed cells
2. Isolation of plasmid DNA from bacterial cells
3. Digestion of vector DNA with restriction enzyme
4. Ligation of DNA fragments
5. Preparation of culture media for cultivation of bacteria
6. Streak Plate method
7. Spread Plate Method
8. Simple staining
9. Methylene blue reduction test in Milk
10. Gram staining
11. Microbial estimation of Curd sample
12. Cell counting using Hemocytometer
13. Cell viability testing
14. Preparation of tissue culture medium and membrane filtration.
15. Preparation of single cell suspension from lymphoid organs
16. Pregnancy diagnosis
17. Extraction of DNA from animal cells

SEMESTER – III

Zoo 302: Economic Zoology

UNIT-I.

1.1Definition and scope of aquaculture.
1.2Culture of prawns-fresh water, post harvesting processing.
1.3General account of Edible fresh water fishes.
1.4Carp culture: management of ponds, processing and preservation.
Plankton as a live feed for Fisheries.
Poly culture practices.

UNIT-II.

2.1History, scope and status of Sericulture Industry in India.
2.2Species of silkworm, life history of mulberry silkworm (Bombyx mori) and tasar silkworm (Antheraea mylitta).
2.3Silk worm diseases.
2.4Brief idea of cocoon processing for silk fabric - cocoon boiling, reeling, rereeling, winding, doubling, twisting and weaving

UNIT-III:

3.1Types of honey bees.
3.2Life cycle, culture of honey bees using movable frame hive.
3.3Methods of bee keeping, enemies of bees.
3.4Bye products of Honey bees and its economic importance.

UNIT-IV:

4.1Lac culture – Lac insect,(Laccifera lacca); - Life cycle, Lac processing, Lac products andEconomic Importance.
4.2Pearl culture and Pearl Industry. Vermiculture and Composting
Economics of Poultry keeping: Morphology of different breeds of Chicken-
4.3Broodingand Rearing of Chicks-Processing of Egg, Meat and By-Products of Poultry.
4.4Dairy farm management, Milch breeds. Draught breeds, Dual purpose breeds and NewCross breeds of Cows and Buffaloes in India.

SUGGESTED READING MATERIAL:

1. Sukla, G.S. and Upadhyay, V.B., 2000 Economic Zoology – ISBN – 81-7133-137-8 Rastogi Publications, Meerut, India.
2. Jawaid Ahsan and Subhas Prasad Sinha, 2000 A Handbook on Economic Zoology-ISBN-81-219-0876-O S. Chand & Co., Ltd., New Delhi.
3. Ashok Kumar and Prem mohan Nigam, 1991 Economic and Applied Entomology Emkay Publications, New Delhi.
4. Shammi, Q.J. and Bhatnagar, S., 2002 Applied Fisheries: ISBN-81-7754-114-5 Agrobios (India), Jodhpur – India.
5. Major Hall, C.B. 2005 Ponds and Fish culture - ISBN-81-7754-146-3 Agrobios (India), Jodhpur – India.
6. Keith Wilson, N.D.P., 2005 A Handbook of Poultry Practice – ISBN-81-7754-O-69-6 Agrobios (India), Jodhpur – India.
7. Banerjee, G.C. 1992 Poultry – III- Edition – ISBN-81-204-008-4 Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi. B.Sc. Zoology: Syllabus (CBCS) 45
8. Banerjee, 1988 A Text Book of Animal husbandry-VIII-Edition-ISBN-81-204-1260-5 Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi.
9. Kaushish, S.K., 2001 Trends in Livestock Research – ISBN-81-7754-112-9 Agrobios (India), Jodhpur – India.
10. Ismail, S.A. 1997. Vermicology the Biology of Earth worm Orient Longman, India
11. A. Mary violet Christy 2008 vermy technology MJP Publ. Chennai

Zoo-305P-PRACTICALS OF ECONOMIC ZOOLOGY

1. Identification of Fish by-products.
2. Identification of Important Cultivable species of Aquaculture.
3. Study of the method of Rearing of Silk worm.
4. Estimation of Sericin content from Silk worm Cocoon.
5. Identification of the stages of Silk worm Life cycle.
6. Identification of pearl producing molluscs and characterization of pearls.
7. Study of the method of apiculture
8. Technique of induced breeding in the fish.

SEMESTER – III

Zoo 303:IE-A: Animal Ecology and Environmental Biology

UNIT-I

1.1 Ecosystem: Food chains and food webs, trophic levels and ecological pyramids. Types of Lotic, Lentic and Marine ecosystems.

1.2 Energy flow patterns and energetic of ecosystems – Laws of thermodynamics. Calculationof energy budget. Biomass and productivity.

1.3 Population Ecology: Natality, Mortality, Density, Age- Structure, Biotic Potential, Dispersion and Growth pattern. Regulation of Population size - Density dependent and density independent factors.

1.4 Types of interactions-Intra-specific and inter-specific, Niche concept.

UNIT-II

2.1 Communities: Definition, structure and organization. Major communities – Grassland,Forest and Desert communities. Biotypes, Ecological dominance.

2.2 Ecotone and edge effect. Primary and Secondary ecological successions.

2.3 Abiotic Factors: Bio-kinetic zone, Temperature tolerance. T

2.4 Thermal stratificationTemperature and seasonal variations, Jordan's Rule, Bergman's Rule,

Halocline, Salinity preferandom, Salinity as limiting factor in the distribution of animals.Aspects of light – Photoperiodism and biological rhythms.

UNIT-III

3.1 Environmental pollution: Types of pollution and pollutants. Air and water pollution – theirsources, biological effects and control measures in general.

3.2 Environmental Laws: Environmental Laws in India- Legislation and Execution.

3.3 Bioindicators and Environmental monitoring.

3.4 Bioremediation; Need and scope of bioremediation.

UNIT-IV

4.1 Global climatic changes: Global warming; Green House Effect; IPCC; Kyoto Protocol.

4.2 Green House Gases and the role of CO2 as a major pollutant; Mitigation of atmospheric $CO_2$by terrestrial ecosystems;

4.3 Carbon sequestration; Bioenergy plantations for mitigating atmospheric CO_2.

4.4 Biofuels and Bioenergy.

SUGGESTED READING MATERIAL:

1. Begon, M., JL. Harper and C.R. Townsend. Ecology, Individuals, populations and communities. Blackwell, Oxford, UK.
2. Cherrette, J.M. Ecological concepts. Blackwell Sci/.Publi. Oxford U.K.
3. Elseth, B.O. and K.M. Baumgartner. Population Biology, Van Nostrand Co., New York.
4. Jorgensen, S.E. Fundamentals of Ecological modeling. Elsevier, New York.
5. Kerbs, C.J. Ecological Concepts, Harper & Row, New York.

Zoo-306P-PRACTICALS OF ANIMAL ECOLOGY AND ENVIRONMENTAL BIOLOGY

1. Estimation of oxygen content in polluted and non-polluted waters.
2. Estimation of carbon dioxide in relation to diurnal variation.
3. Estimation of Organic matter in polluted and non-polluted waters.
4. Estimation of salinity in marine and freshwaters.
5. Qualitative analysis of plankton.
6. Estimation of moisture holding capacity of soils.
7. Estimation of BOD in different water samples
8. Calculation of energy budget of an ecosystem
9. Analysis of OP compounds in water samples through TLC
10. Estimation of inorganic phosphate levels and biomass in surface and sediment waters 8. Determination of Calcium in a sedimentary bed and surface waters of freshwater pond

SUGGESTED READING MATERIAL

1. Biodiversity-K.C. Agarwal, 1998
2. Conservation Biology,Peggy 1. Fieldler & Peter M. Kareiva, 1997
3. The Oxford Anthology of Indian Wild life, Vol. Oxford University Press, New Delhi, Mahesh Rangarajan, 1999
4. The Oxford Anthology of Indian Wild Life, Vol.il Oxford University Press, New Delhi, Mahesh Rangarajan, 1999
5. Principles of Forest Pathology, John Wiley & Sons, Inc, Canada & USA, EH. Tainter, EA, Baker, 1996
6. Natural Resource Conservation. An Ecological approach by Oliver S. Owen Mc. Millan Publishing Company, New York.
7. Wild life in India-V.V.Saharia, 1982, Natraco Pub., Dehradun.
8. Biodiversity Principles & Conservation, Kumar & Asija-published by Upadesh Purohit by Agrobios (India), Jodhpur, 2002.
9. Trends in Wild life biodiversity, conservation and management-B.B. Hosetti & M. Venkateshwarlu-Daya Publishing House, Delhi- Vol. II, 2001.
10. Biological Diversity & Environment- M. Shamin JairajpuriCBS Publishers & Distributors, New Delhi, 1996.
11. Biodiversity, Taxonomy & Ecology- R.K.Tandon & prithipalsingh-Scientific Publishers, Jodhpur, 1999
12. Environmental impact assessment & management. Editors B.B Hosetti & A. Kumar, 1998, Daya Publishing House, Delhi

Zoo 304: Molecular Biology

UNIT-I: Molecular nature of Genome

1.1Watson and Crick Model; Types of DNA; Properties of DNA (C- value paradox, Cotvalue)

1.2Nuclear and mitochondrial genome

1.3Structure of gene (Cistron, Muton, Recon, Cis-trans test)

1.4DNA damage and repair: Biological induction of repair, photo reactivation, Excisionrepair, Recombination repair, SOS repair, and Mismatch repair.

UNIT-II: Replication

2.1Replication in Prokaryotes: *Geometry* of DNA replication, semi conservative replication.

2.2Enzymology of DNA replication: DNA Po1ymerases I, II and III; Replication of Eukaryotic Chromosomes; Eukaryotic DNA polymerases; Multiple forks; 2.3Replication of Chromatin.

2.4Discontinuous Replication: Fragments in Replication fork and detection of fragments; Events in the replication fork; De novo initiation and covalent extension. Bidirectional replication, Termination of replication

UNIT III: Transcription and Translation

3.1Transcription: Types of RNA, enzymes and molecular mechanisms involved intranscription.

3.2Processing of rRNA, tRNA and RNA in Prokaryotes and Eukaryotes, Ribozyme

3.3Translation: Genetic code, Polypeptide chain initiation, elongation and termination

3.4Post translational modification; Role of antibiotics in protein synthesis

UNIT IV: Gene expression and Molecular Biology Techniques

4.1Genetic regulation: Induction, Repression, Lac Operon, Lambda Operon

4.2Tryptophan Operon, Britten and Davidson model for Eukaryotic regulation

DNA sequencing, DNA finger printing, Polymerase chain reaction (PCR), RT-PCR,

4.3Microarray and gene expression analysis

4.4Molecular probes, cDNA probes, RNA probes, Nock translated probes: Restrictionmapping, RFLP

SUGGESTED READING MATERIAL

1. Molecular Biology by David Freifelder, 1993
2. Molecular Biology of Gene-by lD.Watson, 1988
3. Harper's review of Biochemistry by D.W. Martin et al1990
4. Biochemistry by A.L. Lehniger
5. Cell and Molecular Biology-E.D.P. De Robertis and E.M.F.
6. Concepts in Molecular Biology-S.C. Rastogi, VN. Sharma and Ananda Tandon (1993) Genes VII by Benjamin Lewin

Zoo 306P- PPRACTICALS OF MOLECULAR BIOLOGY

1. Isolation of DNA
2. Estimation of DNA by diphenylamine method
3. Thermal melting point of DNA
4. Hyperchromacity of DNA
5. Agarose Gel Electrophoresis
6. Estimation of protein content in specific fraction
7. Estimation of RNA by orcinol method
8. Southern and Western blotting

SEMESTER – IV

Zoo 401: DEVELOPMENTAL BIOLOGY

UNIT-I:

1.1: Origin of germ line cells, Origin and mechanism of cell lineage, migration ofgerm cells to genital ridges, embryonic stem cells, nuclear transplantation experiments, Transgenics in analysis of development.

1.2: Production of gametes and establishment of polarity and symmetry.

1.3: Leydig cells function; Endocrine regulation of spermatogenesis and vitellogenesis.

1.4: Fertilization: Cell surface molecules in sperm egg recognition molecular events of post fertilization.

UNIT-II:

2.1: Cleavage, Blastula, Gastrulation in different animals, Molecular mechanismsdetermining germ layers formation; fate maps.

2.2: Induction, competence, determination and differentiation.

2.3: Developmental gradients in Hydra

2.4: Cell aggregation and differentiation in Dictyostelium.

UNIT-III:

3.1: Axes and Pattern formation in Drosophila, amphibia and chick.

3.2: Organogenesis – Vulva formation in Caenorhabditis elegans; Eye lens induction,limb development.

3.3: Regeneration – Types of regeneration, Axial patterning during regeneration.

3.4: Metamorphosis – Hormonal regulation of metamorphosis in insects and amphibians.

UNIT-IV:

4.1: Environmental regulation of normal development.

4.2: Sex determination in animals (The mechanism of mammalian primary sex determination – Secondary sex determination: Hormonal regulation of the sexual phenotype).

4.3: Programmed cell death – Incidence of Apoptosis; Apoptosis during animal development; Apoptosis in metamorphosis and morphogenesis; Apoptosis during limb development Biochemical & molecular mechanisms involved in Apoptosis.

4.4: Aging and senescence – Reactive oxygen and cell senescence, Dietary restriction and anti aging action., Genetic control of longevity, Age related diseases.

SUGGESTED READING MATERIAL

1. Austen, C.R. and Short, R.V. Reproduction in Animals
2. Schatten and Schatten. Molecular Biology of Fertilization.
3. F.T. Longo, Fertilization, Chapman & Hall
4. R.G. Edwards, Human Reproduction
5. S.F. Gillbert, Developmental Biology, Sinauer Associates Inc., Massachusetts
6. Ethan Bier The Coiled Spring Harlsor Laboratory Press, NewYork
7. Molecular Developmental Biology – 2008, T. Subramonian, Narosa Publishing House.

Z00 405P- PRACTICALS OF DEVELOPMENTAL BIOLOGY

1. Observation of developmental stages in frog and chick
2. Observation of different cleavage stages in the eggs of Lymnea (fresh water snail)
3. Role of shell during developmental of chick
4. Protein turnover during development of chick
5. Phosphorous metabolism in developing chick embryo
6. Role of calcium during development of Chick Embryo
7. Calorific values during the development of chick
8. Ontogeny of excretory pattern in developing chick
9. Vitellogenesis in Crab
10. Fecundity index in Crab
11. Induced breeding in Frog
12. Spermatozoa observation in different vertebrates
13. Histology of Gonads.
14. Sperm Motility.
15. Study of Permanent Stained mounts of Chick.
16. Estimation of Calcium in Shell, Yolk and Albumin of Chick.
17. Cryopreservation.
18. Vitellogenesis and Fecundity in Crabs.
19. Frog - Induced Ovulation and Induced Fertilization.

SEMESTER – IV

Zoo 402: Neurobiology and Animal Behaviour

UNIT-I

1.1Micro anatomy of neurons and types of nerve cells.

1.2Autonomic nervous system – Sympathetic Division, Parasympathetic Division.

1.3Bioelectrical properties of neurons (Resting membrane potential- Nearnst equation;Sodium and potassium pump; Propagation of nerve impulse.

1.4Synapses: Structure and Integration (Types of synapses; Ultra structure of synapseChemical transmission; Electrical transmission)

UNIT-II

2.1Chemical composition of the nervous system-cerebrospinal fluid-CNS barriers

2.2 Synthesis –storage-release and inactivation mechanisms and functions of the followingneurotransmitters; Acetylcholine &Catecholamines (Norepinephrine, Epinephrine, Dopamine)

2.3. Amino acid Neurotransmitters-Glutamate and GABA

2.4 Neuropeptides (Oxytocin and Vasopressin), Mood Disorders like Depression, Schizophrenia, Neurodegenerative disorders like Parkinsonism, Alzheimer's disease

UNIT-III

3.1 General introduction: An over view of concept of Animal behavior

3.2 Visual Perception, Auditory perception and Olfactory Perception

3.3 Animal aggression and Homing territoriality

3.4 Social organization, Advantages, Social organization in insects, primates

UNIT-IV

4.1Conditioning Learning (Classical and Operant conditioning and, Multiple-responselearning)

4.2 Cognitive Learning (Insight Learning, Sign Learning, Latent Learning)

4.3Kinds of remembering (Redintegrative memory –Recall – Recognition-RelearningRetrieval Process-Theories of Memory).

4.4The nature of forgetting (Decay through disuse- Interference effects, motivatedforgetting, improving memory)

SUGGESTED BOOKS

1. Neurobiology. Shepherd, G.M.OxfordUniversity press, London
2. Basic Neurochemistry-G.J. Siegal, R.W. Albers, B.W. Agranoff, R. Katzman (1981) Little, Brown and company. Boston.
1. Introduction to Nervous system-T.H. Bullock, R. Cork, A. Granner (1977); W.H Freeman&Co.
2. Principles of Neural Science –E.R. Kandel and J.H. Schwertz. (1981); Elsevier/North Holland. NY. Oxford.
5. Mechanism of Drug Action on the Nervous System- M.A.B. Brazil, R.W. Ryall. (1979); cambridge University Press. Cambridge, London and New York.
6. The Bio Chemical basis of Neuropharmacology-J.R. Cooper, F.E. Bloom, &R.H. Roth. (1982); Oxford University Press, NY and London.
1. Principles of NeuroPhychopharmacology- Robert S. Feldman, Jerrold S. Meyer and Lind F. Quenzer. Sinauer Associates, Inc. Publishers. Sunderland. Massachusetts.
2. Alcock, J. Animal behaviour: An evolutionary approach. Sinauer Assoc., Sunderland, Mass.USA.
3. Bradbury, J.W. and S.L.Vehrencamp. Principles of animal communication. Sinauer Assoc. Sunderland, Mass. USA.
4. Clutton-Brock, T.H. the evolution of parental care. PrincetonUniv. Press, Princeton, NJ, USA.
5. Eibl-Eibesfeldt, I. Ethology. The biology of behaviour. Holt, Rinehart and Winston, New York.
12. Gould, J.L. The mechanisms and evolution of behaviour.

Zoo 405 P-PRACTICALS IN NEUROBIOLOGY

1. Heteropolar and multipolar neuron
2. Sensory neurons
3. Coelentarata nerve net
4. Pyramidal cell from cortex
5. Motor neuron from spinal cord
6. C.S. of spinal cord
7. Bipolar cell from olfactory bulb
8. Neuromuscular junction
9. Stretch receptors in cray fish
10. Organization of sepia central nervous system
11. Synapse enlarge
12. Stellate ganglion in sepia
13. Isolation and identification of different regions of mice brain
14. Spinal reflexes in decerebrated frog

PRACTICALS IN ANIMAL BEHAVIOR

1. Habituation learning in snails
2. Spacial learning in albino rats
3. Locomotor activity in albino rats
4. Spotters
5. Insight learning in chimpanzee

6. Insight learning in raccoon
7. A chimpanzee using a stick to obtain an apple
8. Thorndike puzzle box
9. Instrumental conditioning
10. Imprinting
11. Feeding behaviour
12. Bee language
13. Courtship behaviour
14. Classical conditioning
15. Social behaviour
16. Pheromones in ants
17. Round and waggle dance of scout honey bee
18. Spatial leaning in bee wolf
19. Symbiosis adaptation
20. Aggressive mimicry

SEMESTER – IV

Zoo 403: Enzymology

UNIT-I:

1.1 Historical Background, overview and specific examples, nomenclature and classificationof enzymes–IUB system, chemical nature and properties of enzymes.
1.2 Enzyme specificity (Absolute specificity, Group specificity, Broad specificity).
1.3 Enzyme catalysis, Quantitative measurement of enzyme activity, Assay of enzyme activity-units of enzyme activity.
1.4 Isolation and purification of enzymes, intracellular distribution of enzymes.

UNIT-II:

2.1 Theories of enzyme kinetics - kinetic theory and collision theory.
2.2 Enzyme kinetics and its importance, derivation of Michaelis-Menton equation, Methodsof Vmax and Km determination, construction of Line weaver burk plots.
2.3 Effect of reactant concentrations (Rate constant, First order, Second order and Zero order kinetic reactions, Ramachandran plot, determination of slope).
2.4 Effect of Temperature, pH and enzyme concentration on reaction rate.

UNIT-III:

3.1 Inhibition of enzyme activity (competitive, non-competitive, uncompetitive and mixedinhibition).
3.2 Kinetics of allosteric enzymes.
3.3 Regulation of enzyme activity (Metabolic regulation), Catalytic efficiency of enzymes(feed back inhibition, covalent modification).
3.4 Mechanism of enzyme action (Lock and Key, Induced fit model), catalytic site, role ofmetal ions.

UNIT-IV:

4.1 Clinical Aspects of enzymology, Medical and Therapeutic applications of enzymes; Enzymes-Clinical diagnosis.
4.2 Immobilized enzymes, various methods of immobilization-ionic bonding, absorption, covalent bond (based on R groups of amino acids).
4.3 Iso enzymes and multiple forms of enzymes.
4.4 Enzyme engineering–economic importance of enzyme production. Enzymes in industries- food, biotechnology and other industries.

SUGGESTED READING MATERIAL:

1. Biochemical calculations. I.H. Segel, 2nd Ed., John Wiley & Sons.
2. Biochemistry. D. Voet & J.G. Voet, J.Wiley & Sons.
3. Enzyme Kinetics. I.W. Segil.
4. Enzyme Kinetics. D.V. Roberties, Cambridge University Press.
5. Harper's Biochemistry. Robert K. Murrey, Peter A. Mayer, D.K. Granner, V.W. Rodwell, Lange Medical.

Zoo406P-PRACTICALS OF ENZYMOLOGY

1. Effect of Temperature on Rat liver succinate dehydrogenase activity
2. Effect of PH on Rat liver succinate dehydrogenase activity
3. Effect of substrate concentration succinate dehydrogenase activity
4. Effect of Enzyme concentration succinate dehydrogenase activity
5. Determination of Optimal conditions for succinate dehydrogenase activity

3. Determination of kinetic constants such as Km and Vmax
4. Inhibitor sensitivity (determination of IC50)
5. Effect of inhibitors on SDH activity and determination of inhibitors constant
6. Estimation of GOT and GPT in the serum samples
7. Isolation and purification of arginase
8. Isolation of LDH isozymes using electrophoresis
9. Determination of Ks (substrate constant) for any allosteric enzyme using Hill equation

SEMESTER – IV

Zoo:404: Endocrinology

UNIT-I

1.1Introduction to Endocrinology- Historical back ground, characteristic features ofhormones

1.2Classification and chemical nature of hormones

1.3Mechanism of hormone action (Peptide and Steroid hormones)

1.4General account of Pheromones

UNIT-II

2.1Structure and functions of hormones of Pineal, Pituitary, thyroid and Parathyroid

2.2Structure and functions of hormones of Adrenals, Pancreas and Gastrointestinal tract

2.3Hormones in female sexual cycle, Pregnancy and lactation

2.4Hormones of Testis and regulation of spermatogenesis

UNIT-III

3.1Biosynthesis and secretion of hormones corticosterioid hormones-peptide hormones-catecholamines

3.2Hormone receptors; receptor structure and signal transduction mechanism-G-proteinfamily

3.3Hormones in crustaceans - growth, development and reproduction.

3.4Hormones in insects - growth, development and reproduction.

UNIT-IV

4.1Growth hormones and growth factors

4.2Hormones and homeostasis (Calcium, glucose, Phosphate, water)

4.3Hormonal regulation of carbohydrate, nitrogen and lipid metabolism

4.4Hormones as pharmaceuticals

SUGGESTED READING MATERIAL

1. Barrington. E.J.W. General and comparative Endocrinology Cambridge Press, Oxford.
2. Bentley, P.J. Comparative Vertebrate Endocrinology, Cambridge Press, Oxford
3. Williams, R.H. Text Book of Endocrinology, W.B. Saunders Co., Philadelphia.
4. Martin, C.R. Endocrine Physiology. OxfordUniv. Press, Oxford.
5. Prakash S. Lohar. Endocrionology-Hormones and human health-2005. MJP Publishers-Chennai

Zoo-406P- LIST OF PRACTICALS OF ENDOCRINOLOGY

1. Observation of the histological section of the pituitary, adrenals, pancreas and gonads
2. Isolation and extraction of pituitary gland from fish
3. Estimation of glucose levels in the blood of frog/rat exposed to adrenaline and insulin
4. Estimation proteins in the reproductive tissues of a fish injected with pituitary extract
5. Estimation of SDH activity in the heamolymph of eyestalk ablated crab
6. Estimation of oxygen consumption in eyestalk ablated crab
7. Demonstration on the effect of ligature on the development of larvae of insects
8. Estimation of glucose in alloxon-induced diabetes
9. Effect of adrenalectomy on total proteins in the liver of albino rats

SEMESTER – IV

Zoo:407PD: Project Dissertation and Viva-voce