

SARDAR PATEL UNIVERSITY
Programme: B.Sc. (ZOOLOGY)
Semester: V
Syllabus with effect from: June 2020

Paper Code: US05CZOO21	Total Credit: 4
Title Of Paper: Invertebrate	

Unit	Description in detail	Weightage (%)
1	History of Animal Taxonomy Types of Classification Taxonomic Hierarchy Binomial nomenclature Modern trends in animal taxonomy: <ul style="list-style-type: none"> • Taxonomy, Systematic & Biosystematics • Neo taxonomy Type: Paramecium	25%
2	Origin of Metazoan Coral and coral reefs Type: Aurelia (Jelly fish) Evolution of Parasitism in Platyhelminthes Parasitic Adaptations of Flatworms Helminthes & Diseases: <i>Schistosoma Mansoni</i> , <i>Ancylostome duodenale</i> , <i>Trchuris trichiura</i> , <i>Enterobius vermicularis</i> , <i>Dranculus medinensis</i>	25%
3	Type: Ascaris Coelomoducts and Nephridia in Annelids Trochophore larva and its significance Regeneration & Asexual reproduction in Polychetae Type: Scorpion	25%
4	Larvae of crustaceans Crustacean Parasites Type : Sepia Type: Starfish	25%

Basic Text & Reference Books:

Zoology phylum series [Protozoa to Echinodermata] by R L Kotpal
 Invertebrate zoology by R L Kotpal
 Invertebrate zoology by Dhami and Dhami and E. L. Jorden and verma

Learning Outcome:

- Classical Zoology, History of Classification and Taxonomy of Invertebrate
- Detail study of Animal types
- Detail study of topics related to Different phyla



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Paper Code: US05CZOO22	Total Credit: 4
Title Of Paper: Physiology	

Unit	Description in detail	Weightage (%)
1	<ul style="list-style-type: none"> • Types of Muscle tissue (structure & Functions of all types) • Properties of Muscle tissue • Types of Muscle protein • Mechanism of Muscle Contraction • Muscle metabolism • Regeneration of muscle tissue • Disorders: Brief account of Myasthenia Gravis, Muscular Dystrophy, Fibromyalgia, • Abnormal contraction of Skeletal muscles 	25%
2	<ul style="list-style-type: none"> • General organization of nervous system • Histology of nervous tissue • Types of neurons • Conduction of nerve impulse • Neurotransmitters • Human brain structure & function • Human cranial nerve 	25%
3	<ul style="list-style-type: none"> • Spinal nerves • Autonomous nervous system • Reflex action • The special senses: <ul style="list-style-type: none"> Olfaction Gustation Vision • Hearing & equilibrium • Aging & the special senses • Disorders: Brief account of Cataracts, Glaucoma, Deafness, Otitis media 	25%
4	<ul style="list-style-type: none"> • Comparison of control by the Nervous & Endocrine system • Endocrine glands: Histology & functions of Pituitary gland, Thyroid gland, Parathyroid gland, • Adrenal gland, Pancreatic Ilets, Pineal gland • Hormone activity • Mechanisms of hormone action, • Control of hormone secretion • Hormonal Disorders of above glands • Other endocrine tissues & organs, Eicosanoids 	25%

Basic Text & Reference Books:

- Animal physiology - A.K.Berry
- Principal of anatomy & physiology-Tortora
- Human physiology - C.C,Chettergi

Learning Outcome:

- Physiology of Muscle, Nervous and Endocrine Gland

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Paper Code: US05CZOO23	Total Credit: 4
Title Of Paper: Genetics & Biotechnology	

Unit	Description in detail	Weighting (%)
1	Epistasis & Non-Epistasis interaction Lethal genes Cytoplasmic or Extra nuclear inheritance: Kappa particle in paramecium, Shell coiling in Limnea Mitochondrial & Chloroplast DNA Sex linked & sex influenced genes Crossing over Gene linkage	25%
2	Mutation: classification Nature of mutation Human genetics: pedigree analysis, amniocentesis, twins, disorders due to Mutant genes, karyotyping of human chromosomes, banding techniques. Eugenics: positive and negative Euphenics	25%
3	Polymorphism in DNA Types of non genetic RNA Biosynthesis of protein, Component of protein synthesis [amino acid, DNA, RNA, Ribosome, and enzymes]. PCR Electron Microscopy Microtomy: fixation & Staining Cell fractionation Radioimmuno Essay HPLC	25%
4	Animal cell and tissue culture: disaggregation, isolation, slide, flask, organ Culture, whole embryo culture. In vitro fertilization [IVF]: types and causes of infertility, assessment of patient, treatment of patient for IVF, oocyte recovery, preparation of semen, oocyte Culture and IVF, fertilization, embryo transfer. Superovulation, IVF and embryo transfer Transgenic animals, Cancer: mutation of the tumor, morphology of cancer cells, carcinogenesis Oncogenesis.	25%

Basic Text & Reference Books:

Genetics: P S Verma.

Genetics: M.P.Arora.

Genetics: P.K.Gupta.

Cell biology, Genetics and Molecular biology: P.S.Verma.

Learning Outcome:

- Post Mendelian Genetics and Human Genetics Interaction
- Basic Biotechnology and In vitro Fertilization and its applications

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Paper Code: US05CZOO24	Total Credit: 4
Title Of Paper: Ecology and Animal Behavior	

Unit	Description in detail	Weighting (%)
1	<p>Community Ecology:</p> <ul style="list-style-type: none"> • Species richness, Dominance, Diversity, Abundance, Vertical Stratification, Ecotone and edge effect. <p>Ecological Niches:</p> <ul style="list-style-type: none"> • Parameters of the Neches, Parallel niches, Niche Separation, Niche overlap 	25%
2	<p>Biodiversity:</p> <ul style="list-style-type: none"> • Measuring species diversity, Importance of Biodiversity, Loss of Biodiversity, Natural Biodiversity, Benefits of Biodiversity, Threatened of Biodiversity, Endangered species Management. <p>Major anthropogenic Global environmental problems:</p> <ul style="list-style-type: none"> • Acid rain, greenhouse effect • Ozone depletion • Eutrophication • Global warming & climatic change 	25%
3	<p>Methods of studying behavior:</p> <ul style="list-style-type: none"> • Naturalistic, Experimental, Statical <p>Reproductive Behavior:</p> <ul style="list-style-type: none"> • Introduction, Type of fertilization, Characteristics of courtship • Attention and courtship: Visual, Sound, Light, Tactile, Courtship on Stickle back fish. <p>Sexual behavior:</p> <ul style="list-style-type: none"> • Asymmetry of sex, Sexual dimorphism, Mate choice, Intra-sexual selection(Male rivalry),Inter- sexual selection (Female choice), Sexual conflict in Parental care. 	25%
4	<p>Biological Rhythm</p> <ul style="list-style-type: none"> • Types and characteristics of Biological rhythms: • Short and long term rhythm, Circadian rhythm, Epicycles, Tidal rhythms, lunar rhythms, Circannual Rhythms, Photoperiod and regulation seasonal reproduction of Vertebrates, Role of Melatonin. <p>Biological clock:</p> <ul style="list-style-type: none"> • Introduction, The concept of Average, amplitude, phase and period of Biological clock, Significance of Biological clock, Chronopharmacology. 	25%

Basic Text & Reference Books:

Ecology & Environment: P.D.Sharma
 Ecology: Mohan P. Arora
 Environmental biology: P.S.Verma & V.K.Agrawal
 Zoology for IAS: Satguru Prasad
 Animal behavior: Reena mathur

Learning Outcome:

- Animal habitate with aspect of Ecology
- Concept of Biodiversity, Animal Behavior
- Concept of Rhythem and Clock

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Paper Code: US05CZOO25		Total Credit: 6
Title Of Paper: Practical Based on papers US05CZOO21-22-23-24		
Part -1	<ul style="list-style-type: none">• Protozoa: Entamoeba, Diffugia, Foramenifera, Actinospherium, Rediolaria, Monocystis, Stentor, Balantidium• Porifera: leucosolenia, Euspongea, Chalina,• Coelenterata: Plumularia, Porpita, lucernaria, Alcyonium, Corelium, Vergularia, Medrepora.• Platyhelminthes: Schistosoma, Echinococcus,• Nematoda: Trichinella spiralis, Trichuris.• Annelida: Sabella, Heteronereis, Serpula, Bonelia• Arthropoda: Branchipus, Cypris, Argulus, Mysis, Gammarus, Squeilla, Centipede, Locust, Belostoma.• Mollusca: Patella, Cypraea, Doris, Snail, Slug, Mytilus, Pecten, Terido, Loligo.• Echinodermata: Starfish Pedicellaria, Bipinaria, Branchiolaria, Ophiopluteus, Echinopluteus, Auricularia,• Hemichordata: Ptychodera.• Mouth parts of insects [housefly, mosquito, moth]• To study community by quadrat method.• Soil and water analysis• To study abiotic components. [PH , turbidity, Temperature and light intensity]• Protozoan culture	2 credits
Part-2	<ul style="list-style-type: none">• Study of mitosis by Squash preparation of onion root tip.• Study of meiosis from grass hopper testis.• Mounting of giant chromosomes from Chironomous larva.• Study of different characteristics of drosophila.• Genetics problems.• Isolation of DNA from tissue.• Bioinformatics. [phylogeny]• Study of animal relationship through chart /specimen/live observation.• Study of different animals with reference to their behavior.• Visit to SICART	2 credits
Part-3	<ul style="list-style-type: none">• Total count of RBC• Total count of WBC• Estimation of Blood glucose.• Estimation of Serum protein.• Estimation of Blood cholesterol.• Estimation of Serum Creatinine.• Mammalian histology by permanent slides. [Types of Muscle fibers and Nerve Fibers, Spinal Cord]• Preparation skeletal and smooth muscle.• Preparation nerve tissue.• ESR	2 credits

Basic Text & Reference Books:

Practical zoology invertebrate: P S Verma.

Practical zoology invertebrate: S S Lal.

Practical physiology anatomy and biochemistry: Patel and goel

Practical biochemistry: Plumer

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Syllabus with effect from: November 2020

Paper Code: US05DZOO26	Total Credit: 2
Title Of Paper: Wild Life	

Unit	Description in detail	Weighting (%)
1	Wild life of India, Sanctuary of India. National parks under special Projects : Tiger, Lion, Elephant, Crocodile breeding Projects Endangered species	25%
2	Biosphere reserves: Desert, Grassland, Fresh water and Marine water Wetlands of Gujarat and their importance. Values of wild life Wild life organizations.	25%
3	Habitat analysis, Evaluation and Management of Wild life Physical parameters: Topography, Geology, Soil and Water, Biological Parameters : Food, cover, forage, browse and cover estimation Standard evaluation procedure: Remote sensing and GIS	25%
4	Eco tourism/ Wild life tourism in Forest and Ecological disturbance Management of excess population and translocation Care of injured and diseased animal Estimation of carrying capacity	25%

Basic Text & Reference Books:

- Ecology & Environment: P.D.Sharma
- Environmental biology: P.S.Verma & V.K.Agrawal
- Zoology for IAS: Satguru Prasad
- Wild life: M.M.Ranga
- Animals of India: BNHS Publication
- Endangered Animals of India & their conservation: Nair S.N.

Learning Outcome:

- Details of National Parks and Sanctuary
- Ecosystem of Habitats
- Significance of Eco tourism animal Care



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Paper Code: US05DZOO27	Total Credit: 2
Title Of Paper: Animal Rescue and Rehabilitation	

Unit	Description in detail	Weighting (%)
1	<ul style="list-style-type: none"> • Animal behaviour of stray Animals • Biosecurity • First aid • Liability issues 	25%
2	<ul style="list-style-type: none"> • Wild animals Rescue within domestic area • Wild animals rehabilitation • distress in wild animals identify symptoms and causes of distress • treat common injuries such as broken limbs and wings • restrain, transport, and release wildlife 	25%
3	<ul style="list-style-type: none"> • Basics of Animal Science • Animal Pharmacy • Animal Care and Domestication 	25%
4	<ul style="list-style-type: none"> • Animal Food • Animal Nutrition • Animal Handling • Animal Cleaning 	25%

Basic Text & Reference Books:

Environmental biology: P.S.Verma&V.K.Agrawal
 Zoology for IAS: Satguru Prasad
 Wild life: M.M.Ranga
 Animals of India: BNHS Publication

Learning Outcome:

- Basics of Animal care and domestication
- Rescue of injured stray and wild animals