Marks: 85	PART –II(CLASS-XII)	Time: 3:00 Hours

CHAPTER:15 HOMEOSTASIS

Concepts in Homeostasis

Osmoregulation

Water relations of cell, Balance of water and solutes in the body, Osmoregulation in Plants, Osmoregulation in Animals, Osmoregulation in Different Environments, Excretion, Excretion in Plants, Excretion in Animals, Nature of Excretory Products in Relation to Habitats

Excretion in Representative Animals: Excretion in Hydra, Excretion in Planaria, Excretion in Earthworm, Excretion in Cockroach

Excretion in Vertebrates: Excretion in Human, Eretory Organs, Urinary System, Concentration of Excretory Products, Kidney as Osmoregulatory Organ, Kidney Problems and Cures

Thermoregulation: Adaptations in Plants to Low and High Temperature

Mechanisms in Animals

Body Heat, Heat Gain and Loss, Temperature Classification of Animals, Regulation of Heat Exchange between Animals and Environment

Thermoregulation in Mammals (Human)

Regulatory Strategies, Thermostat Function and Feedback Controls in Human, Temperature in fever (Pyrexia)

CHAPTER:16 SUPPORT AND MOVEMENTS

Concept and Need

Support in Plants: Significance of Secondary Growth

Movements in Plants: Types of Movements, Role of Plants Growth Substances in Plant Movement

Support and Movements in Animals: Hydrostatic Skeleton, Exoskeleton, Endoskeleton

Human Skeleton: Axial Skeleton, Appendicular Skeleton, Joints

Deformities of Skeleton: Genetic Causes, Hormonal Causes, Nutritional Causes

Repair of Broken Bones

Muscles: Smooth Muscles, Cardiac Muscles, Skeletal Muscles, Sliding Filament Model, Controlling the Actin-Myosin Interaction by Ca ++ ions, Energy for Muscles Contraction, Muscles Fatigue, Tetany, Cramp

Arrangement of Skeletal Muscles for Movement of Skeleton

Movement of Bones,

Locomotion in Protoctista and Invertebrates

Locomotion in Euglena, Locomotion in Paramecium, Locomotion in Amoeba, Locomotion in Jelly Fish, Locomotion in Earthworm, Locomotion in Cockroach, Locomotion in Snail, Locomotion in Star Fish

Locomotion and Skeleton in Vertebrates: Swimming in Fishes, Locomotion in Amphibian, Locomotion in Reptiles, Locomotion in Air, Locomotion in Mammals, Evolutionary changes in the arrangement of bones and related mode of locomotion in major groups of vertebrates

CHAPTER:17 COORDINATION AND CONTROL: Introduction

Coordination in Plants: Control Through Hormones,

Plant Movements

Responses to Environmental Stresses in Plants

Defense against Pathogens in Plants

Biological Clocks and Circadian Rhythms

Plant Hormones: Auxins, Gibberellins, Cytokinins, Abscisic Acid, Ethene

Co-ordination in Animals

Nervous Co-ordination: Receptors, Working of Sensory Receptors with Special Reference to Skin, Neurons, Effectors, Reflex Arc, Nerve Impulse, Synapse, Evolution of Nervous System

Human Nervous System: Central Nervous System (CNS), Peripheral Nervous System (PNS), Autonomic Nervous System, Nervous Disorders, Effect of Drugs on Coordination

Chemical Coordination: Hormones

Endocrine Glands of Mammals: Hypothalamus, The Pituitary Gland, Thyroid gland, Parathyroids, Islets of Langerhans (Pancreas), Adrenals, Gut, Gonads, Feedback Mechanism, Comparison of Nervous Coordination and Chemical Coordination

Behaviour: Innate Behaviour, Instincts & Learning, Learning Behaviour (Modification through experience)

CHAPTER:18 REPRODUCTION: Introduction

Reproduction in Plants: Parthenocarpy, Seed Dormancy, Fruit set and Fruit ripening, Photoperiodism, Vernalisation

Reproduction in Animals: Asexual Reproduction

Tissue Culturing and Cloning

Identical Twins

Sexual Reproduction

Reproduction in Man: Male Reproductive System, Female Reproductive System

Test Tube Babies

Sexually Transmitted Diseases (STD): Gonorrhea, Syphilis, Genital Herpes, AIDS

CHAPTER:19 GROWTH AND DEVELOPMENT: Intorduction

Growth and Development in Plants

Apical Meristems, Intercalary Meristems, Lateral Meristems

Types of Growth: Conditions of Growth, External factors, Internal Factors, Differentiation, Growth Correlations

Growth and Development in Animals: Development of Chick, Mechanisms of Development, Role of Cytoplasm in Development, Role of Nucleus in Development, Concept of Differentiation, Embryonic Induction

Aging

Regeneration

Abnormal Development

CHAPTER:20 CHROMOSOMES AND DNA: Introduction

Types of Chromosomes

Composition of Chromosome

The Chromosomal Theory of Inheritance

DNA as Hereditary Material: Chemical Nature of DNA, DNA Replication, The Meselson-Stahl Experiment, The Replication Process

What is a Gene: One-gene / one – polypeptide, How DNA encodes protein structure

Cells Use RNA to Make Protein: Three types of RNA, Transcription

Genetic Code

Translation

Mutations

CHAPTER:21 CELL CYCLE : Introduction

Interphase

Mitosis: Karyokinesis, Prophase, Metaphase, Anaphase, Telophase, Cytokinesis, Importance of mitosis, Cancer (uncontrolled cell division)

Meiosis: ProphaseI, MetaphaseI, AnaphaseI, TelophaseI, MeiosisII, Importance of Meiosis

Meiotic Errors (Non-disjunction): Down's Syndrome (Mongolism), Klinefelter's Syndrome, Turner's Syndrome, Necrosis and Apoptosis

CHAPTER:22 VARIATION AND GENETICS

Genes, Alleles and Gene Pool

Mendel's Laws of Inheritance: Mendel's Interpretations, Test Cross, Dihybrid and Dihybrid Cross

Dominance Relations: Complete Dominance, Incomplete Dominance, Codominance, MN Blood Type or Blood Group System, Over Dominance

Multiple Alleles: ABO-The First Discovered Multiple Allelic Blood Group System in Man, Rh Blood Group System

Epistasis: Bombay Phenotype

Pleiotropy

Continuously Varying Traits

Gene Linkage

Crossing Over: Cross Over or Recombination Frequency
Sex Determination: Sex Chromosomes, Patterns of Sex Determination, Comparison of chromosomal determination of sex between Drosophila and Humans, Sex Determination in Plants
Sex Linkage: Sex Linkage in Drosophila, Sex-linkage in Humans, Sex Limited Trait, Sex Influenced Trait
Diabetes Mellitus and its Genetic Basis

CHAPTER:23 BIOTECHNOLOGY: Intorduction
Cloning of a Gene: Recombinant DNA Technology, how to get a gene? Molecular Scissors: Restriction Endonucleases, Molecular Carrier: Vector, Recombinant DNA, Expression of the Recombinant DNA, Genomic Library, The Polymerase Chain Reaction, Analyzing DNA, Gene Sequencing
The Human Genome Project
BiotechnologyProducts: Transgenic Bacteria, Transgenic Plants, Transgenic Animals, Cloning of Transgenic Animals
Gene Therapy
Tissue Culture: Genetic Engineering of Plants, Agricultural Plants with improved Traits, Production of Products

CHAPTER:24 EVOLUTION
Introduction, Concept of Evolution Vs Special Creation
Evolution from Prokaryotes to Eukaryotes
Inheritance of acquired Characteristics: Charles Darwin, Neo-Darwinism-The modern evolutionary synthesis, Evidences of Evolution
Natural Selection and artificial Selection
Population, Gene Pool, allele and Genotype Frequencies
Hardy-Weinberg Theorem, Factors affecting gene frequency
Endangered Species

CHAPTER:25 ECOSYSTEM : Introduction
Ecosystem, Biosphere Autecology, Synecology
Components of Ecosystem: Biotic Components, Abiotic Components, Processes in Ecosystem and interaction between Biotic and Abiotic Components
Succession: Two Major Forms of Succession, Predation and its Significance, Parasitism and its Significance, Symbiosis, Mutualism, Commensalism, Grazing
Biogeochemical Cycles: The Nitrogen Cycle, Nitrogen Depletion and its Remedies, The flow of Energy in Food Chain of an Ecosystem

CHAPTER:26 SOME MAJOR ECOSYSTEMS
Climate
Aquatic or Hydrospheric Ecosystem: Productivity of Aquatic Ecosystem, Fresh Water Lakes, Intervention of Man in Aquatic Ecosystem
Terrestrial or Lithospheric Ecosystem: Light, Nutrients and Water, Adaptations for Terrestrial Ecosystem, Division of Terrestrial Ecosystem
Some Major Ecosystems in Pakistan: Temperate Deciduous Forests, Coniferous Alpine and Boreal Forests, The Grass Land Ecosystem, Desert Ecosystem, Tundra Ecosystem, Humans and Ecosystems

CHAPTER:27 MAN AND HIS ENVIRONMENT
Renewable and Non-renewable Resources: Renewable Resources
Degradation and Depletion of Resources: Modification of Environment
Man's Impact on Environment: Population, Food and need of Population Control, Importance of Forests, Forest and Climate, Forest and Biodiversity
Pollution: Types of Pollution, Air or Atmospheric Pollution, Greenhouse Effect, Acid Rain, Water Pollution, Eutrophication or Algal Bloom, Industrial Effluents, Insecticides & Herbicides and Fertilizers
Health and Diseases: Classification and Causes of Diseases

WEIGHTAGE OF VARIOUS THEMES/SECTION OF SYLLABUS FOR CLASS XII

			No. of practicals
(vi)	Functional Biology	(Chapter15-19)	48%
(vii)	Continuity of life	(Chapter 20-22)	20%
(viii)	Genetic Frontiers	(Chapter 23)	4%
(ix)	Life through ages	(Chapter 24)	8%
(x)	Organisms and their Environment	(Chapter 25-27)	20%
		Total:	100

LIST OF PRACTICALS FOR CIASS XII (PART-II)

1. Investigation of Adaptive Features of Hydrophytes, Halophytes, Exrophytes and Mesophytes from Fresh Material and Prepared Slides.
2. Exposure of Urinogenital System of Frog.
3. Study of Simple Muscle Twitch Using Frog's Muscle.
4. Study of Prepared Slides of Skeletal, Smooth & Cardiac Muscles & Preparation of Slide of Striated Muscle.
5. Expose of Nervous System of Cockroach.
6. Investigations of Effect of Indole Acetic Acid (IAA) on Growth of Oat Coleoptile or Germinated Barley Seeds.
7. Study of Ductless Glands (Pancreas, Thyroid) Using Microscopic Sections.
8. Study of Skeleton of Frog.
9. Study of Skeleton of Hen's Egg.
10. Study of Development of Chick Embryo 48/72 Hours after Incubation.
11. Study from Prepared Slides of Plant Supporting Tissues such as Sclerenchyma & Collenchyma.
12. Investigation of Plant Movement.
13. Preparation of Root Tips Squashes to Study Stages of Mitosis.
14. Preparation of Squashes of Rheodiscolor Floral Buds to Study Meiosis & Observation of Stages of Meiosis from Prepared Slides & Study of Polytene Chromosomes.
15. Continuous Variations.
16. Investigation of Water Content of Soil.
17. Investigation of Approximate Soil Texture (Rough Estimate) of Proportion of Particles of Different Sizes in a Soil.
18. Investigation of Food Chain and Food Web of a Pond Ecosystem.
19. Sampling of Grassland Community by Quadrate Method.
20. Estimation of Pyramids of Number Using Simple Techniques.

BIOLOGY TOPIC WISE WEIGHTAGE

Chapter No.	Topic	Weightage (%age)	No. of period.
15	Homeostasis Osmoregulation excretion	10%	15
16	Support and Movements	10%	15
17	Coordination and Control	10%	15
18	Reproduction	12%	18
19	Growth and Development	6%	9
20	Chromosomes and DNA	8%	12
21	Cell Cycle	4%	6
22	Variations and Genetics.	8%	12
23	Biotechnology	4%	6
24	Evolution	8%	12
25	Ecosystem	8%	12
26	Some major ecosystems	4%	6
27	Man and-his environment	8%	12
	TOTAL		**150**

Recommended Book: Biology Part-I & II

Authors: **1.** Prof. Dr. A.R. Shakoori **2.** Prof. Dr. Abdul Majeed Cheema
3. Asso.Prof. Hamid Saeed **4.** Assoc.Prof. Dr. Rass Masood Khan
5. Assoc.Prof. Nauman Usmani **6.** Assoc.Prof. A.R. Saeed
7. Dr. Javed Iqbal Qazi **8.** Assoc.Prof. Javed Akhtar Wahla
9. Asst.Prof.Dr. Farkhanda **10.** Sub.Specialist Mrs. Syeda Saira Hameed

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