

BOARD OF SECONDARY & SENIOR SECONDARY SCHOOL EDUCATION
ALIGARH MUSLIM UNIVERSITY, ALIGARH (2020-21)

Remark: Highlighted portion in the following syllabus is to be taught as per the teaching schedule, however it may not be the part of any examination.

Course Structure
CLASS XII (2020-2021)
(THEORY)
Part-A: Botany

Unit-VI Reproduction

Chapter-1: Reproduction in Organisms

Reproduction, a characteristic feature of all organisms for continuation of species; modes of reproduction- asexual and sexual reproduction; asexual reproduction – binary fission, sporulation, budding, gemmule formation, fragmentation; vegetative propagation in plants.

Chapter-2: Sexual Reproduction in Flowering Plants

Flower structure; development of male and female gametophytes; pollination- types, agencies and examples; outbreeding devices; pollen-pistil interaction; double fertilization; post fertilization events- development of endosperm and embryo, development of seed and formation of fruit; special modes apomixes, parthenocarpy, polyembryony; Significance of seed dispersal and fruit formation.

Unit VII Genetics and Evolution

Chapter-5: Principles of Inheritance and Variation

Heredity and variation: Mendelian inheritance; deviations from Mendelism- incomplete dominance, co-dominance; pleiotropy chromosome theory of inheritance; chromosomes and genes;

Chapter-6: Molecular Basis of Inheritance

Search for genetic material and DNA as genetic material; Structure of DNA and RNA; DNA packaging; DNA replication; Central dogma; transcription, genetic code, translation; gene expression and regulation – lac-operon;

Unit-VIII Biology and Human Welfare

Chapter-9: Strategies for Enhancement in Food Production

Plant breeding, tissue culture, single cell protein, Biofortification

Chapter-10: Microbes in Human Welfare

In household food processing, industrial production, sweage treatment, energy generation and microbes as biocontrol agents and biofertilizers. Antibiotics; production and judicious use.

Unit-IX Biotechnology and its Application

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Chapter 12: Biotechnology and its Application

Application of biotechnology in health and agriculture: Human insulin and vaccine production, stem cell technology, gene therapy; genetically modified organisms- Bt crops; transgenic animals; biosafety issues, bio-piracy and patents.

Unit-X Ecology and Environment

Chapter-13: Organisms and Populations

Habitat and niche, Plant adaptations

Chapter-14: Ecosystem

Ecosystems: Patterns, components; productivity and decomposition; energy flow; pyramids of number, biomass, energy; nutrient cycles (carbon and phosphorous); ecological succession; ecological services- carbon fixation, pollination, seed dispersal, oxygen release (in brief).

Chapter-16: Environmental Issues

Air pollution and its control; water pollution and its control; agrochemicals and their effects; solid waste management; radioactive waste management; greenhouse effect and climate change impact and mitigation; ozone layer depletion; deforestation; any one case study as success story addressing environmental issue (s).

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PRACTICALS

A. List of Experiments

1. Study pollen germination on a slide.
2. Collect and study soil from at least two different sites and study them for texture, moisture content, pH and water holding capacity. Correlate with the kinds of plants found in them.
3. Collect water from two different water bodies around you and study them for pH, clarity and presence of any plants.
4. Study the presence of suspended particulate matter in air at two widely different sites.
5. Study the plant population density by quadrat method.
6. Study the plant population frequency by quadrat method.
7. Prepare a temporary mount of onion root tip to study mitosis.
8. Study the effect of different temperatures and three different pH on the activity of salivary amylase on starch.
9. Isolate DNA from available plant material such as spinach, green pea seeds, papaya, etc.

B. Study/observation of the following (Spotting)

1. Dissect the given flower and display different words. Dissect anther and ovary to show number of chambers.
2. Flowers adapted to pollination by different agencies (wind, insects, birds).
3. Pollen germination on stigma through a permanent slide.
4. Meiosis in onion bud cell through permanent slides.
5. Mendelian inheritance using seeds of different colour/sizes of any plant.
6. Controlled pollination- emasculation, tagging and gaging.
7. Two plants (models/virtual images) found in xeric conditions. Comment upon their morphological adaptations.
8. Two plants (models/virtual images) found in aquatic conditions. Comment upon their morphological adaptations.

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CLASS XII
Subject: Zoology
(THEORY)

Unit-I REPRODUCTION

Chapter-3: Human Reproduction

Male and female reproductive systems; microscopic anatomy of testis and ovary; gametogenesis- spermatogenesis and oogenesis; menstrual cycle; fertilisation, embryo development upto blastocyst formation, implantation; pregnancy and placenta formation (elementary idea); parturition (elementary idea); lactation (elementary idea).

Chapter-4: Reproductive Health

Need for reproductive health, Sexually Transmitted Diseases (STDs) and their prevention; birth control- need and methods, contraception; medical termination of pregnancy (MTP); amniocentesis; infertility and assisted reproductive technologies- IVF, ZIFT, GIFT (elementary idea for general awareness).

Unit II GENETICS AND EVOLUTION

Chapter-5: Principles of Inheritance and Variation

Multiple alleles and inheritance of blood groups; elementary idea of polygenic inheritance; Sex determination – in humans, birds and honey bee; linkage and crossing over; sex linked inheritance – haemophilia, colour blindness; Mendelian disorders in humans – thalassemia; Chromosomal disorders in humans; Down's syndrome, Turner's and Klinefelter's syndromes.

Chapter-6: Molecular Basis of Inheritance

Genome and human and rice genome projects; DNA fingerprinting.

Chapter-7: Evolution

Origin of life; biological evolution and evidences for biological evolution (paleontology, comparative anatomy, embryology and molecular evidences); Darwin's contribution, modern synthetic theory of evolution; mechanism of evolution- variation (mutation and recombination) and natural selection with examples, types of natural selection; Gene flow and genetic drift; Hardy – Weinberg's principle; adaptive radiation; human evolution.

Unit-III ZOOLOGY AND HUMAN WELFARE

Chapter-8: Human Health and Diseases

Pathogens; parasites causing human diseases (malaria, dengue, chickengunia, filariasis, ascariasis, typhoid, pneumonia, common cold, amoebiasis, ring worm) and their control; Basic concepts of immunology- vaccines; cancer, HIV and AIDS; Adolescence- drug and alcohol abuse.

Chapter-9: Strategies for Enhancement in Food Production

Based on CBSE syllabus

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Improvement in food production; Apiculture and **Animal husbandry.**

Unit-IV BIOTECHNOLOGY AND ITS APPLICATIONS

Chapter-11: Biotechnology – Principles and processes

Genetic Engineering (Recombinant DNA Technology)

Unit –V: ECOLOGY AND ENVIRONMENT

Chapter-13: Organisms and Populations

Organisms and environment; animal adaptations; population, population interactions- mutualism, competition, predation, parasitism; population attributes- growth, birth rate and death rate, age distribution.

Chapter-15: Biodiversity and its Conservation

Biodiversity-Concept, patterns, importance; loss of biodiversity; biodiversity conservation; hotspots, endangered organisms, extinction, Red Data Book, biosphere reserves, national parks, sanctuaries and Ramsar sites.

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PRACTICALS

Zoology

Practical Paper

Time: 1 ½ Hours

13 Marks

A List of Exercises

1. Study of human skeleton and different types of joints;
2. (i) To study the presence of urea/acetone.
(ii) To study the presence of sugar in urine.
(iii) To study the presence of albumin in urine.
(iv) To study the presence of bile salts in urine.
3. Identification of stages of gamete development i.e. T.S. of testis and T.S. of ovary through permanent slides (from any mammal).
4. T.S. of blastula through permanent slides.
5. Identification of common disease causing organisms like Acanthamoeba, Entamoeba, Plasmodium, Enterobius through permanent slides or specimens. Comment on symptoms of disease that they cause.
6. Two animals found in xerophytic conditions. Comment upon their morphological adaptation.
7. Two animals found in aquatic conditions. Comment upon their morphological adaptations.

PRACTICAL EXERCISES
SUBJECT: ZOOLOGY
CLASS XII

1. To study and identify stages of gamete development: T.S. of mammalian testis and T.S. of mammalian ovary through permanent slides.
2. To study of T.S. of amphibian blastula through permanent slide.
3. To identify common disease causing organisms Tapeworm, Ascaris, Entamoeba, Plasmodium, Pinworm through permanent slides or specimens. Comment on symptoms of disease that these pathogens cause.
4. To test the presence of urea, sugar, albumin in urine.
5. To study human skeleton and different types of joints.