Cambridge International School, Mohal, Kullu

Class - XII

Subject – Biology

Subject Code(044)

Curriculum

Session 2020-21

Unit	Chapter Name	Practical	Month	Assessment
Unit 1:	**Reproduction** 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, fragmentation; vegetative propagation in plants. 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-apomixis, parthenocarpy, polyembryony; Significance of seed dispersal and fruit formation. Human Reproduction: Male and female eproductive 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). Reproductive health: Need for reproductive health and prevention of sexually transmitted diseases (STDs); birth control - need and methods, contraception and medical termination of pregnancy (MTP); amniocentesis; infertility and assisted reproductive technologies - IVF, ZIFT, GIFT (elementary idea for general awareness).	• Study pollen germination on a slide.	**March -April**	Pen paper test Group discussion Value based questions VSA
Unit 2	**Genetics and Evolution** Heredity and variation: Mendelian inheritance; deviations from Mendelism - incomplete dominance, codominance, multiple alleles and inheritance of blood groups, pleiotropy; elementary idea of polygenic inheritance; chromosome theory of inheritance; chromosomes and genes; Sex determination - in humans,	• Mendelian inheritance using seeds of different colour/sizes of any plant. • Prepared pedigree charts of any one of the genetic traits such as rolling of tongue, blood groups, ear lobes,widow's peak and	**May- June**	Pen paper test Group discussion Value based questions VSA

	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. 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; genome and human and rice genome projects; DNA fingerprinting. 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.	colour blindness • Prepare a temporary mount of onion root tip to study mitosis. • Meiosis in onion bud cell or grasshopper testis through permanent slides.		
Unit 3	**Biology and Human Welfare** Health and disease: 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. Improvement in food production: Plant breeding, tissue culture, single cell protein, Biofortification, Apiculture and Animal husbandry. Microbes in human welfare: In household food processing, industrial production, sewage treatment, energy generation and as biocontrol agents and biofertilizers. Antibiotics; production and judicious use.	• Common disease causing organisms like Ascaris, Entamoeba, Plasmodium, Roundworm through permanent slides or specimens. Comment on symptoms of disease that they cause. • Two plants and two animals (models/virtual images) found in xeric conditions. Comment upon their morphological adaptations. • Two plants and two animals (models/virtual images) found in aquatic conditions. Comment upon their morphological adaptations.	**July-August**	Pen paper test Group discussion Value based questions VSA
Unit 4	**Biotechnology and Its Applications** Principles and processes of biotechnology: Genetic Engineering (Recombinant DNA Technology).	• Study the effect of different temperatures and three different pH	**September**	Pen paper test Group discussion Value based

	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.	on the activity of salivary amylase on starch.		questions VSA
Unit 5	**Ecology and Environment** Organisms and environment: Habitat and niche, population and ecological adaptations; population interactions - mutualism, competition, predation, parasitism; population attributes - growth, birth rate and death rate, age distribution. 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). Biodiversity and its conservation: Concept of biodiversity; patterns of biodiversity; importance of biodiversity; loss of biodiversity; biodiversity conservation; hotspots, endangered organisms, extinction, Red Data Book, biosphere reserves, national parks, sanctuaries and Ramsar sites. 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; ozone layer depletion; deforestation; any one case study as success story addressing environmental issue(s).	• 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. • Collect water from two different water bodies around you and study them for pH, clarity and presence of any living organism. • Study the presence of suspended particulate matter in air at two widely different sites • Study the plant population density by quadrat method. • Study the plant population frequency by quadrat method.	**October-November**	Pen paper test Group discussion Value based questions VSA

PRACTICALS

Evaluation Scheme **Maximum Marks: 30**

One Major Experiment	5 Marks
One Minor Experiment	4 Marks
Slide preparation	5 Marks
Spotting	7 Marks
Practical Record+Viva Voce	4 Marks
Project Record + Viva Voce	5 Marks
Total	30 Marks