

final examination of Class-VII issued by Principal/Head Master or any Educational Institution duly recognised by Govt. of Odisha/ Central Govt. or other competent authority.

- vii. Disability certificate issued by the Medical Board of the concerned district in case of PwD candidates. The candidates with permanent disability shall get reservation in the Benchmark category advertised. The candidates with temporary disability shall have to produce recent disability certificate.
- viii. Candidates claiming reservation /age relaxation under Ex-servicemen category must submit Discharge certificate, identity Card & P.P.O issued by the appropriate Authority indicating there in the Date of Entry, Date of Discharge & Period of Service rendered in Defence forces.
- ix. In-Service contractual employees claiming age relaxation and contractual In-service benefits must submit a Certificate from employer as per proforma prescribed by the Commission vide the **Advisory Notice No.3568/OSSC dated 01.11.2019** available in the website of the Commission www.osscc.gov.in.

7. Plan of Examination:

The plan, pattern, scheme and syllabus of Examination is as follows:-

Stages of Examination.	Type of Examination	Nos. of papers	Name of Subjects	Marks allotted	Duration	Remarks
Stage-I	Main Written Examination	Two Paper	Paper-I (Composite Paper)	100 marks	1 hour	Questions will be of objective type with multiple choices of answers. The examination will be conducted in OMR Answer sheet / Online Test (CBRT Mode). Candidates about 03 (three) times of the vacancies advertised from each category as per advertisement will be shortlisted for Document Verification. <u>There will be negative marking @0.25 marks for each wrong answer in Paper-II only.</u>
			Paper-II (Technical Paper)	100 marks	1 ½ hours	
Stage-II	Certificate verification	-		-	-	The candidate who will not attend the certificate verification his/her name will not be taken into consideration while preparing the merit list. The candidates found suitable in certificate

						verification shall be selected in order of merit category wise as per vacancies advertised.
		Total		200 marks		

Main Written Exam

Papers	Subjects	Maximum Marks	Time
Paper-I (Composite Paper)	Odia Language	20	1 hours
	General English	20	
	Computer Fundamentals	20	
	General Studies	40	
	Total	100	
Paper-II (Technical Paper)	The brief and concise syllabus for the paper-II is at Annexure-D attached below.	100 Marks	1 ½ hours
	Grand Total	200	

Note: There will be negative marking (0.25 marks) for each wrong answer in Paper-II (Technical Paper) only.

Syllabus for Written Examination.

Composite Paper- (Paper-I) -100 marks

Composite Paper consists of 100 questions of multiple choices of the following subjects. The standard of question in this Paper will be of HSC standard.

General Studies-The question of General Studies will relate to Indian History, Economics, Geography, Indian Polity, General Science, Environmental Issues, Human right Issues, Current events.

Computer Fundamentals-Windows, MS Office, (Word, Excel, PowerPoint), MS Access, & Usage of Internet services.

General English – Grammar, usage & vocabulary

Odia Language- Grammar, usage & vocabulary

Technical Paper- (Paper-II)- Detail syllabus of Technical paper is attached at Annexure-D.

**Syllabus for Recruitment to the post of Field Assistant(Sericulture)
by Odisha Sub-ordinate Staff selection Commission**

(i) Economic Botany

Origin of cultivated plants: Concept of centre of origin, their importance with reference to Vavilov's work. Examples of major plant introductions, crop domestication and loss of genetic diversity, evolution of new crops/varieties, importance of germ plasm diversity

Silk worm host plant: General account with special reference to *Terminalia arjuna*, *Terminalia tomentosa*, *Shorea robusta*, *Morus alba*, *Ricinus communis*, *Manihot utilisima*, *Machilus bombycina*, *Litsaea polyantha* & *Heteropanax fragrans*.

Arboriculture and Moriculture.

Fibres:- Classification based on the origin of fibres, cotton & jute(morphology, extraction and uses).

(ii) Genetics: Mendelian Genetics and its extension Mendelism: History, Principles of inheritance, Chromosome theory of inheritance, Autosomes and Sex chromosomes, probability and pedigree analysis, Incomplete dominance and co-dominance, multiple alleles, Lethal alleles, Epistasis, pleiotropy, Recessive and Dominant traits, penetrance and Expressivity, Numericals: Polygenic inheritance.

(iii) Bio Molecules and Cell Biology: Types and significance of chemical bonds; Structure and properties of water; pH and buffers

Carbohydrates: Nomenclature and classification; Role of monosaccharides(glucose, fructose, sugar alcohols, mannitol and sorbitol); Disaccharides(sucrose, maltose, lactose), Oligosaccharides and polysaccharides(structural cellulose, hemicelluloses, pectin, chitin, mucilage, storage, starch, insulin)

Nucleic acids: Structure of nitrogenous bases; Structure and function of nucleotides; Types of nucleic acids, Structure of A, B, Z type of DNA, Types of RNA, Structure of tRNA

Enzymes: Structure of enzymes: holoenzymes, apoenzymes, cofactors, coenzymes and prosthetic group; Classification of enzymes; Features of active site, substrate specificity, mechanism of action(activation energy, lock and key hypothesis induced-fit theory) , Michaelis-Menten equation, enzyme inhibition and factors affecting enzyme activity.

The Cell: Cell as a unit of structure ;and function; Characteristics of prokaryot
an eukaryotic cells; Origin of eukaryotic cell(Endosymbiotic theory) Cell wa
and plasma membrane: Chemistry, structure and function Plant Cell Wa
Overview of membrane function; fluid mosaic model, Chemical compositio
of membranes, membrane transport Passive, active and facilitated transpor
endocytosis and exocytosis.

Cell division: Eukaryotic cell cycle, different stages of mitosis and meiosis; Ce
cycle, Regulation of cell cycle

(iv) Soil & Soil Profile:

Importance, origin, formation, composition, physical, chemical and biological
components ,Role of climate in soil development

(v) Water: Importance, status of water in the environment, Atmospheric
moisture, precipitation types (rain, fog, snow, hail, dew)
Hydrological cycle, water in soil, water table

(vi) Biotic Interactions:

Population ecology-Characteristics & dynamics

Ecological speciation

Plant communities-Concept of ecological amplitude, Habitat & niche

Characters-analytical and synthetic

Ecotone and edge effect, Dynamics-Succession processes, Climax concepts

(vii) Ecological Pyramids:

Functional aspects of ecosystem-Principles and models of energy flow,
Production and Productivity, Ecological efficiencies

Biogeochemical cycles-cycling of carbon, Nitrogen and Phosphorus

(viii) Phytogeography: Principles, Continental drift, Theory of Tolerance,
Endemism, Brief description of major terrestrial biomes, Phytogeographical
division of India, Local vegetation

(ix) Plant Systematics: Plant identification, Nomenclature and Biosystematics:
Identification: Field inventory, Functions of Herbarium; Important herbaria and
botanical gardens of the world and India; Virtual herbarium; E-flora;
Documentation: Flora, Monographs, Journals; Keys: Single access and Multi-
access

Taxonomic hierarchy: Concept of taxa(family, genus, species): Categories and
taxonomic hierarchy Species concept(taxonomic, biological, evolutionary)

Botanical nomenclature: Principles and rules(ICN) ; Ranks and names;
Typification, author citation, valid publication, rejection of names, principle of
priority and its limitations; Names of hybrids

(x) **Plant water relationship:** water potential and its components , water absorption by roots, aquaporins, pathway of water movement, symplast, apoplast, transmembrane pathways, root pressure, guttation, Ascent of sap, cohesion-tension theory. Transpiration and factors affecting transpiration, and transpiration, mechanism of stomatal movements.

Nutrient uptake : Soil as a nutrient reservoir, transport of ions across cell membrane passive absorption, electrochemical gradients, facilitated diffusion, active absorption, role of ATP, carrier systems, proton ATPase pump and ion flux. Uniport, co-transport, symport, antiport.

Plant growth regulators: Discovery, chemical nature(basic structure). Bioassay and physiological roles of Auxin, Gibberellins, Cytokinin, Abscisic acid, Ethylene, Brassino-steroids and Jasmonic acid

Physiology of flowering: Photo periodism, flowering stimulus, florigen concept, vernalization, Seed dormancy.

(xi)**Concept of metabolism:** Introduction, anabolic and catabolic pathways, regulation of metabolism, role of regulatory enzymes(allosteric, covalent modulation and isozymes) .

Carbohydrate metabolism: Synthesis and catabolism of Sucrose and starch.

Nitrogen metabolism: Nitrate assimilation, biological nitrogen fixation (Examples of Legumes and non legumes), physiology and biochemistry of nitrogen fixation; Ammonia assimilation and transamination.

(xii)**Plant Tissue Culture:** Historical prospective: Aseptic tissue culture techniques, composition of media; Nutrient and hormone requirements(Role of vitamins and Hormone)

(xii)Economic Zoology

Class –Insecta with special reference to serisigenos lepidopterans, their morphology, anatomy, silk gland and diapause behaviour

- a) **Life cycle of Indian Tasar Moth and its food plants**
- b) **Life cycle of Eri Silk Moth and its food plants**
- c) **Life cycle of Muga Silk Moth and its food plants**
- d) **Life cycle of Mulberry Silk Moth and its food plants**
- e)**Rearing of Silk worm: *Antheraea myllita*, *Philosamia ricini* & *Bombyx mori* and its management.**
- f)**Disinfectants, Chawki silk worm rearing, late age rearing and harvesting of cocoons.**
- g)**Silkworm diseases and their management.**
- h)**Silkworm pests and parasites and their management.**
- i)**Silk reeling techniques and Quality assessment of silk fibre**

(xiii) Introduction to Ecology and Ecosystem:

Relevance of studying ecology, History of ecology, Laws of limiting factors, Detailed study of temperature and light as physical factors, Types of ecosystem, Food chain, Detritus and grazing food chains, Food web, Energy flow through the ecosystem, Ecological pyramids.

(xiv) Population: Unitary and modular populations, Unique and group attributes of population-Density, natality, mortality, life tables, fecundity tables, survivorship curves, age ratio, sex ratio, dispersal and dispersion; Exponential and logistic growth, equation & patterns, r and K strategies, Population interactions, Gause's Principle with laboratory and field examples; Lotka-Volterra equation for competition and Predation, functional and numerical responses.

(xv) Community: Community characteristics, dominance, diversity, species richness, abundance, stratification; Ecotone and Edge effect; Ecosystem development (succession) with example and Theories pertaining to climax community, Nutrient and Biogeochemical cycle, Nitrogen & Sulphur cycle.

(xvi) Conservation of Biodiversity:

Types of biodiversity, its significance, loss of biodiversity; Conservation strategies (in situ and ex situ); Endangered species concept; Role of ZSI, WWF, IUCN; Wildlife (Protection) Act, 1972.

(xvii) Biostatistics: Concept, definition and scope of biostatistics, biological data, sampling techniques, measures of central tendency (mean, median and mode), measures of dispersion, hypothesis and testing of hypothesis (chi square test, t-test and Z test), correlation and regression analysis, Data analysis using EXCEL Programme.

(xviii) Phylum Arthropoda: General characteristics and classification up to Classes; Vision in Arthropoda; Respiration in Arthropoda; Moulting in insects; Metamorphosis in insects; Social life in insects (bees and termites) and Larval forms in Crustacea.

(xix) Physiology-Digestive System: Structural organization, histology and functions of gastrointestinal tract and its associated glands; Mechanical and chemical digestion of food; Absorption of carbohydrates, lipids, proteins, water, minerals and vitamins; Role of gastrointestinal hormones on the secretion and control of enzymes of gastrointestinal tract.

(xx) Biomolecules: Structure and properties of important mono-, di- and polysaccharides; Fatty acids, triglycerides and steroids and amino acids and proteins.

- (xxi) Cells and Plasma Membrane:** Prokaryotic and Eukaryotic cells; Mycoplasma; Virus, Virioids, Virions and Prions; Various models of plasma membrane; Transport across membranes; Cell junctions; Occluding junctions (Tight junctions), Anchoring junctions (desmosomes), Communicating junctions (gap junctions) and Plasmodesmata.
- (xxii) Endomembrane system, Mitochondria and Peroxisomes:** The Endoplasmic Reticulum, Golgi apparatus; Mechanism of vesicular transport; Lysosomes; Structure and function of mitochondria; Chemi-osmotic hypothesis; Semiautonomous nature of mitochondria; Endosymbiotic hypothesis and Peroxisomes.
- (xxiii) Cell Cycle and Cell Signalling:** Cell cycle, Regulation of cell cycle; Signalling molecules and their receptors.
- (xxiv) Mendelian Genetics and its Extension:** Principles of inheritance; Incomplete dominance and co-dominance; Multiple alleles, Lethal alleles; Epistasis; Pleiotropy; Sex linked inheritance.
- (xxv) Mutations:** Gene mutations; Chromosomal mutations: Deletion, duplication, inversion, translocation; Aneuploidy and polyploidy; Induced versus spontaneous mutations; Backward and forward mutations; Suppressor mutations; Molecular basis of mutations in relation to UV light and chemical mutagens; Detection of mutations: CLB method, attached X method and DNA repair mechanisms.
- (xxvi) Sex Determination and Quantitative Genetics:** Chromosomal mechanisms of sex determination; Sex linked, Sex influenced and sex limited characters; Polygenic inheritance and Transgressive variation.
- (xxvii) Early Embryonic Development:** Gametogenesis (Spermatogenesis, Oogenesis); Types of eggs; Egg membranes; Fertilization: Changes in gametes, monospermy and polyspermy; Planes and patterns of cleavage; Early development of frog and chick up to gastrulation; Fate maps; Embryonic induction and organizers.
- (xxviii) Post Embryonic Development:** Metamorphosis: Changes, hormonal regulations in amphibians; Regeneration: Modes of regeneration (epimorphosis, morphallaxis and compensatory regeneration); Ageing: Concepts and models.

(xxix) Nucleic Acids and DNA Replication: Salient features of DNA double helix; Watson and Crick model of DNA; DNA denaturation and renaturation; DNA topology- linking number and DNA topoisomerases; Cot Curves; Structure of RNA, t RNA and DNA & RNA associated proteins; DNA replication in prokaryotes and eukaryotes; Mechanism of DNA replication; Role of proteins and enzymes in replication; Licensing factors; Semiconservative, bidirectional and semi-discontinuous replication; RNA priming; Replication of circular and linear ds-DNA and replication of telomeres.

(xxx) Immune System and Immunity: Historical perspective of Immunology, Early theories of Immunology, Cells and organs of the Immune System, Immunity.

(xxxii) History of Life, theories of evolution and extinction: Chemogeny, Biogeny, RNA world, Major events in History of life; Lamarckism, Darwinism, Neo-darwinism, Background of extinction, Mass extinction (Causes, Names of five major extinctions, K-T extinction in detail) and Role of extinction in evolution.

(xxxiii) Processes of Evolutionary Changes: Organic variations; Isolating mechanisms; Natural selection (Industrial melanism, Pesticides/Antibiotic resistance), Types of Natural selection (Directional, Stabilizing and Disruptive); Sexual Selection and Artificial Selection.

(xxxiiii) Species Concept and evolution above species level: Biological concept of species (Advantages & limitations); Sibling species, Polymorphic Species, Polytypic species, Ring Species; Modes of speciation (Allopatric and Sympatric); Macro-evolutionary principles (Darwins Finches); Convergence, Divergence and Parallelism.

(xxxv) Microbiology: History of Microbiology, Microbial world, Characterization, Classification and identification of microbes.

Prokaryotes- General morphology and classification of bacteria, their characters and economic importance; Gram-positive and Gram-negative bacteria.

Eukaryotes- General morphology of Protista and Fungi, Classification and Economic importance.

Viruses- Structure, genome, replication cycle

Microbe interaction- Immune responses-Antibiotics and chemotherapeutic agents; Applied Microbiology in the fields of food, agriculture, industry and environment.
