GOVERNMENT OF JAMMU AND KASHMIR
J&K SERVICES SELECTION BOARD
Hema Complex, Sector -3, Channi Himmat, Jammu
www.jkssb.nic.in

NOTIFICATION

The Jammu and Kashmir Services Selection Board has advertised various posts vide Advertisement Notification No. 05 and 07 of 2020, 01, 02, 04 and 05 of 2021. The syllabus in respect of certain advertised vide aforementioned advertisement notifications has been received from the concerned Indenting Departments. Accordingly, the syllabus for the posts shown in the enclosed list is notified as per the details given in Annexure "A" to "L" of this notification.

The candidates are also intimated that there shall be negative marking for wrong answers (-0.25 for each wrong answer) attempted in the said examination.

This notification is for the purpose of intimation to the concerned candidates only.

(Ashok Kumar)JKAS
Controller of Examinations,
J&K Services Selection Board
Jammu

No. SSB/COE/2021/8543-46 Dated: 08.12.2021

Copy to the: -

1. Director Information, J&K Government, Jammu with the request to get the said notification (except the Annexures which are available on official website) published in at least three leading local newspaper of Jammu/Srinagar for three consecutive dates.
2. Private Secretary to the Chairman, JKSSB for information of the Chairman.
3. I/c Web site.
4. Syllabus file

Advt No	Item No.	Department	Name of the post	Cadre of the post	Total	Final Status
05 of 2021	690	Horticulture	Horticulture Technician Grade-IV	Jammu	11	Annexure "A"
05 of 2021	691	Horticulture	Horticulture Technician Grade-IV	Samba	7	
05 of 2021	692	Horticulture	Horticulture Technician Grade-IV	Kathua	20	
05 of 2021	693	Horticulture	Horticulture Technician Grade-IV	Udhampur	12	
05 of 2021	694	Horticulture	Horticulture Technician Grade-IV	Reasi	7	
05 of 2021	695	Horticulture	Horticulture Technician Grade-IV	Doda	5	
05 of 2021	696	Horticulture	Horticulture Technician Grade-IV	Kishtwar	9	
05 of 2021	697	Horticulture	Horticulture Technician Grade-IV	Ramban	4	
05 of 2021	698	Horticulture	Horticulture Technician Grade-IV	Rajouri	10	
05 of 2021	699	Horticulture	Horticulture Technician Grade-IV	Poonch	6	
05 of 2021	700	Horticulture	Horticulture Technician Grade-IV	Srinagar	11	
05 of 2021	701	Horticulture	Horticulture Technician Grade-IV	Ganderbal	4	
05 of 2021	702	Horticulture	Horticulture Technician Grade-IV	Budgam	5	
05 of 2021	703	Horticulture	Horticulture Technician Grade-IV	Anantnag	15	
05 of 2021	704	Horticulture	Horticulture Technician Grade-IV	Pulwama	8	
05 of 2021	705	Horticulture	Horticulture Technician Grade-IV	Kulgam	12	
05 of 2021	706	Horticulture	Horticulture Technician Grade-IV	Baramulla	29	
05 of 2021	707	Horticulture	Horticulture Technician Grade-IV	Kupwara	17	
05 of 2021	708	Horticulture	Horticulture Technician Grade-IV	Bandipora	5	
05 of 2021	709	Horticulture	Horticulture Technician Grade-IV	Shopian	1	
02 of 2021	412	Health & Medical Education	Animal Keeper	Div.Jammu	1	Annexure "B"
02 of 2021	316	Health & Medical Education	Plumber	Jammu	3	
02 of 2021	333	Health & Medical Education	Plumber	Udhampur	2	
02 of 2021	356	Health & Medical Education	Plumber	Kishtwar	1	

02 of 2021	379	Health & Medical Education	Plumber	Rajouri	1	
01 of 2021	063	Horticulture	Senior Horticulture Technician	Div. Kashmir	16	Annexure "C"
01 of 2021	025	Horticulture	Senior Horticulture Technician	Div.Jammu	12	
05 of 2021	689	Jal Shakti	Junior Engineer(Civil)	UT	163	Annexure "D"
07 of 2020	242	Agriculture Production & Farmer's Welfare	Steno Typist	Jammu	1	Annexure "E"
05 of 2020	158	Law, Justice and Parliamentary Affairs	Urdu Typist	UT	1	
05 of 2020	157	Law, Justice and Parliamentary Affairs	Urdu Stenographer	UT	1	
07 of 2020	330	Skill Development	Urdu Shorthand Instructor	Div. Kashmir	1	
05 of 2021	710	Agriculture Production & Farmer's Welfare	Junior Stenographer	UT	1	
05 of 2021	711	Agriculture Production & Farmer's Welfare	Junior Stenographer	Div.Jammu	1	
05 of 2021	712	Agriculture Production & Farmer's Welfare	Junior Stenographer	Div.Kashmir	1	
05 of 2021	713	Agriculture Production & Farmer's Welfare	Junior Assistant	UT	2	Annexure "F"
05 of 2021	714	Agriculture Production & Farmer's Welfare	Junior Assistant	Div.Kashmir	18	
02 of 2021	176	Health & Medical Education	Telephone Operator	Div.Jammu	1	Annexure "G"
02 of 2021	214	Health & Medical Education	Junior Projectionist	Div.Kashmir	2	
07 of 2020	244	Agriculture Production & Farmer's Welfare	Film Operator	Jammu	1	
07 of 2020	245	Agriculture Production & Farmer's Welfare	Film Operator	Kathua	1	
07 of 2020	246	Agriculture Production & Farmer's Welfare	Film Operator	Doda	1	
07 of 2020	295	Agriculture Production & Farmer's Welfare	Film Operator	Budgam	1	

07 of 2020	296	Agriculture Production & Farmer's Welfare	Film Operator	Kupwara	1	
07 of 2020	297	Agriculture Production & Farmer's Welfare	Film Operator	Baramulla	1	
07 of 2020	298	Agriculture Production & Farmer's Welfare	Film Operator	Anantnag	1	
01 of 2021	071	Horticulture	Cleaner	Div. Kashmir	1	Annexure "H"
01 of 2021	101	Horticulture	Cleaner	Baramulla	1	
02 of 2021	309	Health & Medical Education	Screen Technician	Div.Jammu	1	
01 of 2021	113	Horticulture	Katib	Div. Kashmir	1	
01 of 2021	070	Horticulture	Cameraman	Div. Kashmir	1	
01 of 2021	030	Horticulture	Assistant Seamerman	Div.Jammu	1	
01 of 2021	024	Horticulture	Cleaner	Div.Jammu	1	
01 of 2021	111	Hospitality & Protocol Department	Table Boy	Div. Kashmir	1	
05 of 2021	721	Agriculture Production & Farmer's Welfare	Driver	Div.Kashmir	10	Annexure "I"
05 of 2021	722	Agriculture Production & Farmer's Welfare	Driver	Div.Jammu	5	
04 of 2021	657	Animal /Sheep husbandary and Fisheries Department	Deputy Inspector Fisheries/ Equivalent	Div.Kashmir	32	Annexure "J"
04 of 2021	656	Animal /Sheep husbandary and Fisheries Department	Deputy Inspector Fisheries/Equivalent	Div.Jammu	10	
04 of 2021	655	Animal /Sheep husbandary and Fisheries Department	Inspector Fisheries/Farm Manager/Equivalent	UT	6	Annexure "K"
05 of 2020	127	Science & Technology	Technical Officer	UT	1	Annexure "L"
			Total Posts		506	

Annexure "A"

Syllabus for Written test (Objective Type)

Marks:-120
Time: - 2.00 Hours

Soil-General Concept and importance, soil texture (Social Particles): (20 Marks)

- Types of Soil- Sandy, Clayey and loam soils and their general properties i.e. water retention, aeration, nutrient status,
- Soils organic matter- meaning, sources and importance.
- Soil reaction- meaning, acidic and alkaline soils concepts, their effect on plant growth and management.
- Plant Nutrients- names of essential macro and micro nutrients, important functions of N,P and K, their deficiency symptoms in plants.
- Manures- definition, different, types and importance (FYM, compost, Green Manure).
- Fertilizers- Definition, names of common NPK fertilizers, their nutrient percentage, recommended NPK doses for paddy, maize, sarson, Wheat, Apple and Cherry trees grown in Jammu & Kashmir, their mode and methods of application.
- Soil Testing- and its importance.
- Soil erosion- causes, types of erosion, soil conservation a methods with reference to J&K State.
- Introductory Botany.
- Plant parts, root, leaf, stem, flower and their functions
  Modified plant parts with functions,
- Photosynthesis and Importance.
- Seed Structure, Importance, Conditions necessary for germination, Minimum Standards for seed certification, Breeder foundation and certified seed.
- Self and cross- Pollination.
- Elementary studies of following plant families of economic importance.
  - Graminance (Padey and Maize)
  - Rosacae (Apple)
  - Solanacea (Tomato)
  - Cucurbitaceae

- (Bottlegourd)
- Leguminacca (Pea)

Plant protection fundamentals: (20 Marks)

- Definition of disease and their causes
- Symptomology (leaf spot, wilt, blight, mildew, scab etc.)
  Different management Methods
- Fungicides: Definitions, types, formulations, names of common fungicides used in Jammu & Kashmir; care in handling.
- Plant protection equipment, spraying and dusting machines, their working, calibration and maintenance,
- Definition of insect pest, general morphology of insect
  Different insect pest viz, borera, bug, gesed, their
- Economic threshold values
- Insecticides, definition, types. Formulation, names of common insecticides used in Kashmir, cadre in handling.
- Insect pest management methods.
  Extension Education
    - Agri. Extension Education Definition and Importance. Principles, Objectives.
    - Qualities and role of Extension Worker
    - Extension teaching Methods; Classification, approaches i.e., individuals, Group, Mass, discussions, pamphlets, bulletins, charts, diagrams, exhibitions, campaigns, Kissan mela.
    - Brief description of IRDP, SFDA, IAQP, NAEP, KVK with social reference to
    - J&K STATE
    - Farm Planning
    - Village Panchayat and its functions
    - Collections of socio- Economic data; kind of schedules

Nursery Management and propagation 20 Marks

- Location, Soil, fencing, nearness to water source, layout of seed bed, nursery bed, stool bed, stratification.
- Building nursery store and workshop, Store and workshop, tools and implements. Maintenance of nursery.
- Selection of mother plant for bud wood, root stock.
  Budding, grafting, layering
- Fruit production
- Selection of Orchard site.
  Layout of Orchard.
- Orchard floor Management
  Planting, Training, Pruning.
- Cultural Practices including irrigation.
- Cultivation of Apple, Pear, Cherry, Plum, Grapes, Almond, Walnut, Strawberry, Mango and Guava Under following headings;
- Soil, Commercial varieties, pacing, fertilizers, irrigation, harvesting, yield.

Orchard Diseases 20 Marks

- Major diseases, Symptoms, damaging stage and control measures of;
- Apple and pear viz; Scab, Leaf Spot, Mildew Canker. Viz; Stone fruits (Peach, Plum, Apricot, Cherry, Almond) viz Blight and leaf pots.
- Walnut viz; Mistletoe etc
- Grapes viz; Anthrocnose, Mildews.
  Plants protection –(B)
- Major Insect Pests, damaging stage, Symptoms and control measures with respect to following fruit plants (under Jammu and Kashmir Conditions);
- Apple and Pear viz; Sanjose Scale, Borer, Leaf Minor, Aphids mites, Caterpillars.
- Stone fruits (Peach, Plum, Cherry, Almond, Walnuts) viz; Leaf curing aphids, Chaffer beetle etc.
- Pomegranate viz; Anar butter fly.

Physiology (Introductory) 20 Marks

- Introduction to the subject of postharvest technology; nature and extent of postharvest losses in fruits; Factors responsible for post harvest loss. Factors affecting rate of respiration and transpirations; ripening of fruits, Quality attributes of fruits.

Fruit Handling and Storage 20 Marks

- Harvesting techniques of fruits, criteria for harvest maturity of fruits, principle and techniques of pre-cooling, advantages of scientific grading; grade standards for apple, advantages of fruit packing; use of various packing materials; principles of refrigerated and controlled atmosphere storage of fruits, transportation of fruits and its problems; Marketing channels of apples.

Annexure "B"

Syllabus for Written test (Objective Type)

Time: 02.00 Hrs.
Marks: 120

1. English
   a) Nouns and its kinds
   b) Parts of Speech
   c) Masculine/feminine (Gender)
   d) Number (20 Marks)

2. Science
   a) Micro-organism (useful and harmful micro-organism)
   b) Coal and Petroleum origin and uses.
   c) Reproduction in Animals (Elementary Knowledge)
   d) Matter and its States
   e) Force and Pressure.
   f) Motion- Elementary Knowledge.
   g) Stars and Solar System.
   h) Pollution of Air and Water.
   i) Carbon and its allotropic forms.
   j) Light (30 Marks)

3. History
   a) Indian Freedom Struggle after the revolt of 1857.
   b) Gandhiji era of Freedom Struggle.
   c) Moderater and Extremists.
   d) Reform Moments. (30 Marks)

4. Geography
   a) Natural Resources
   b) Demographic Profile of Jammu and Kashmir State.
   c) Population of India as per 2011 Census.
   d) Wildlife National Parks and Sanctuaries in Jammu and Kashmir.
   e) Hydroelectric Potential of Hydroelectric Power Houses in Jammu and Kashmir.
   (25 Marks)

5. Mathematics
   a) Rational Numbers
   b) Linear Equation in one Variable

c) Squares and Square roots.
d) Cubes and cube roots.
e) Simple Algebraic Identities. (30 Marks)

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Annexure "C"

Syllabus for Written test (Objective Type)

Marks:-120
Time: - 2.00 Hours

Section – I

Marks: 30

Fruit Science

Economic importance and classification of horticultural crops, nursery management practices, planting and layout, management of orchards, planting systems and planting densities, nursery techniques and their management. Principles and methods of pruning and training of fruit crops, types and use of growth regulators in horticulture, water management, weed management, fertility management in horticultural crops, intercropping, multi-tier cropping, mulching, bearing habits, factors influencing the fruitfulness and unfruitfulness. Rejuvenation of old orchards, top working, frame working, principles of organic farming.

Need and potentialities for plant multiplication, sexual and asexual methods of propagation, advantages and disadvantages. Seed dormancy (scarification & stratification) internal and external factors. Propagation Structures: Mist chamber humidifiers, greenhouses, glasshouses, cold frames, hot beds, poly-houses, nursery (tools, and implements), uses of growth regulators in seed and vegetative propagation, methods and techniques of cutting, layering, grafting and budding; physiological & bio chemical basis of rooting, factors influencing rooting of cuttings and layering, selection and maintenance of mother trees, collection of scion wood stick, scion-stock relationship, and their influences, Nursery registration act.

Horticultural zones of India, production and export potential, varieties, climate and soil requirements, propagation techniques, planting density and systems, after care, training and pruning. Management of water, nutrient and weeds, special horticultural techniques including plant growth regulators, their solution preparation and use in commercial orchards. harvest indices, harvesting methods, of the following crops. Mango, banana, grapes, citrus, papaya, guava, litchi, loquat. Bearing in mango and citrus, , causes and control measures of special production problems, alternate and irregular bearing overcome,

control measures. Rainfed horticulture, importance and scope of arid and sermi-arid zones of India. Characters and special adaptation of crops: ber , pomegranate, fig.

Classification of temperate fruits, detailed study of areas, production, varieties, climate and soil requirements, propagation, planting density, cropping systems, after care training and pruning , self incompatibility and pollinizers, use of growth regulators, nutrient and weed management, harvesting, of apple, pear, peach, apricot, cherry, strawberry, kiwi, almond, walnut chest nut. Replant problem, rejuvenation and special production problems like pre-mature leaf fall, physiological disorders.

Orchard management, importance, objectives, clean cultivation, sod culture, Sod mulch, herbicides and inorganic and organic mulches, competitive and complimentary effect of root and shoot, systems of irrigation.

Section – II Marks: 20

Vegetable Science

- Classification of vegetable crops.
- Economic and medicinal importance and nutritive value.
- Area and production, exports and imports.
- Description of varieties and hybrids.
- Types of vegetable gardens, kitchen garden; principles of planning and layout.
- Nursery management practices.
- Soil and climate, nutrition, seed rate, preparation of field, transplanting, planting for directly sown/transplanted vegetable crops, spacing, planting systems, water and weed management; nutrient management and deficiencies, physiological disorders and their corrective measures, use of chemicals and growth regulators, harvest, yield, post-harvest handling and storage and marketing and seed production of Tomato, Brinjal, Chilli, Sweet pepper, Potato, Beans, Okra, Bottle gourd, Cucumber, Bitter gourd, Squash, Kale, Cabbage, Cauliflower, Knol-khol, Sprouting broccoli, Lettuce, Garlic, Onion, Leek, Radish, Carrot, Turnip, Beet root, Peas, Broad beans, Cowpea, Spinach, Fenugreek, Fennel and Coriander.
- Factors affecting production and productivity of vegetables.
- Cropping systems.
- Raising of vegetable crops organically.

- Nutrient management through the use of organic manures, vermicomposting, green manuring, biofertilizers.
- Disease and pest management organically.
- Types of protected structures.
- Cultivation of vegetable crops under green houses.
- Important diseases and pests of vegetable crops.
- Integrated disease management in vegetable crops
- Integrated insect-pest management in vegetable crops
- History and scope of vegetable seed industry.
- Principles of vegetable seed production.
- Methods of vegetable seed production.

Section – III Marks: 15

Floriculture and Landscaping

Principles and elements of landscape design, plant material for maintaning flowering calendar in landscaping, symbols, Landscape and Landscaping with basic principles and basic components, walk-paths, bridges, constructed features etc in landscaping.

Scope and importance of commercial floriculture in India, production techniques of ornamental plants like rose, tulip, Narcissus (Daffodils), Lilium, chrysanthemum, orchid, carnation, gladiolus, tuberose, anthurium, marigold and Gerbera for domestic and export market, growing of flowers under protected environments such as glass house, plastic house etc. Soilless cultivation or hydroponics and its implementation in floriculture. Post harvest management of cut flowers (Pulsing, pre cooling, recut of stem, packaging, storage etc), Flower dehydration techniques for different flower crops.

History, scope of gardening, aesthetic values, Gardens in India, types of gardens, landscaping, historical background, Definition: Floriculture industry, importance, area and production, industrial importance in India. Special types of gardens (bog garden, sunken garden, terrace garden, rock garden, bottle garden, water garden, Childrens garden, roof garden), formal, informal and free style gardens, Mugal garden, Japanses garden, English garden, ornamental trees, shrubs, herbaceous perennials, climbers,creepers, palms, ferns,

grasses and cacti succulents for home gardening and landscaping along with different methods of Progagation. Flower arrangement, Bio-aesthetic planning, round country planning, urban planning and planting avenues, schools, villages, beautifying railway stations, dam sites, hydroelectric stations, colonies, river banks, Culture of bonsai. Different methods for turf making including dibbling, turfing, astro turfing, sodding etc. Important grasses for lawns with special features.

Seed production techniques in ornamental annuals, Prospects of seed production in Kashmir.

Scope ,Constraints , Agro climatic zones, Selection of Variety, Maintaining Genetic Purity of flower seeds, Production module for seed production in different annual Crops, Summer season annuals and winter seasonals, Botanical description : Common name, Botanical name, local name, family, Origin, pollination type. Nursery raising, Sowing time and Transplanting Isolation distance, Intercultural operations, Rouging, weed Control, Irrigation, Nutrition, Pinching, Staking, Plant protection, Harvesting: Hand Picking, Shattering, yield, Post harvest management, Seed treatment, Packaging and Seed Storage in *D. caryophyllus*, *D. barabatus*, *Lathyrus odoratus*, *Lupinus sp.* and *Impatiens balsamina, Antirrhinum sp.*, *Godetia sp.*, *Linaria sp.*, *Lobelia sp.*, *Petunia sp.*, *Phlox sp.*, *Salvia splendens*, *Verbena sp.* and *Viola tricolor., Althea rosea*, *Alyssum sp.*, *Calendula sp., Celosia plumosa*, *Centaura sp.*, *Chrysamthemum sp.*, *Clarkia sp.*, *Cosmos sp.*, *Coreopsis sp.*, *Gaidardia sp.*, *Gomphrena sp.*, *Helianthus sp.*, *Helichrysum sp.*, *Iberis sp.*, *Impatiens sp.* and *Zinnia sp*.

Section – IV Marks: 15

Natural Resource Management (NRM)

Introduction to soil fertility and productivity- factors affecting. Essential plant nutrient elements- functions. Salt affected soils - characteristics and management. Role of microorganisms in organic matter- decomposition. Integrated plant nutrient management. Critical limits of plant nutrient elements and hunger signs. luxury consumption, nutrient interactions, deficiency symptoms,

Water resources of J&K . Importance and consumptive use of water. Available and unavailable soil moisture. Water budgeting. Rooting characteristics and moisture extraction pattern. Water requirement of horticultural crops -lysimeter studies, use of pan evaporimeter. Critical stages of crop growth for irrigation. Irrigation scheduling, different

approaches. Methods of irrigation - surface and sub-surface pressurized methods viz., sprinkler and drip irrigation, their suitability, merits and limitations, fertigation. Irrigation management practices for different soils and crops.

Methods of soil and plant sampling and processing for analysis. Soil structure and aggregate analysis. concepts of soil moisture estimation. Methods of estimation of redox potential. Soil fertility evaluation methods. Soil micro-organisms and their importance. Saline, alkali, acid, waterlogged and sandy soils, their appraisal and management. Chemical and mineral composition of horticultural crops. Leaf analysis standards, index tissue, interpretation of leaf analysis values. Quality of irrigation water.

Introduction, concept. Organic production requirements; Biological intensive nutrient management, organic manures, vermicomposting, green manuring, recycling of organic residues, biofertilizers. Weed management.

Section – V Marks: 10

Plant Pathology

Introduction to the science of Phyto-pathology and its objectives. Classification of plant diseases, symptoms, signs, and related terminology. Parasitic causes of plant diseases (fungi, bacteria, viruses, phytoplasma), and their characteristics. Non-parasitic causes of plant diseases. Survival and dispersal of plant pathogens. Plant disease epidemiology and forecasting. Principles and methods of plant disease management. Fungicide classification based on chemical nature and commonly used systemic, non-systemic fungicides and bactericides. Preparation of fungicidal solutions, slurries, pastes and their applications. Importance of micro organisms. Mushrooms-edible (Agaricus and Pleurotus) and poisonous types, preparation of culture/spawn and production techniques.

Symptoms, disease development and integrated management of the diseases of fruits, plantation, medicinal and aromatic crops viz. apple, pear (scab, alternaria blotch, powdery mildew, root and collar rot, cankers, pear fabraea leaf and fruit spot, pear fire blight and apple mosaic virus), peach, plum, cherry, apricot, almond, walnut (peach leaf curl, shot hole, powdery mildew, cercospora leaf spot, peach scab, cryptosporopsis leaf & twig blight and walnut anthracnose), grapes (anthracnose, powdery mildew, downy mildew, bunch rot), strawberry (leaf spot, fruit rot), mango (mango malformation, black tip), banana (panama wilt, bunchy top), citrus (citrus canker, tristeza virus), guava (wilt), tea & coffee

rust, belladonna (leaf spot, root rot), dioscorea (leaf blight, rust) and pyrethrum (leaf blight and wilt). Important post harvest diseases of pome and stone fruits and their management.

Symptoms, disease development and integrated management of the diseases of diseases of vegetables, ornamental and spice crops viz., tomato & potato (early blight, late blight, septoria leaf spot, damping off), brinjal (phomopsis, alternaria blight, damping off), chilli (wilt, anthracnose, damping off), cabbage, cauliflower, radish & knol-khol (alternaria leaf blight, wire stem, white rust) onion & garlic (downey mildew, stemphylum blotch) pea (powdery mildew), beans (anthracnose, rust, mosaic), cucurbits (alternaria leaf spot, anthracnose, downey mildew, powdery mildew, angular leaf spot), saffron (leaf blight, bulb rot), cumin (alternaria blight), turmeric (rhizome rot, leaf spot), ginger (bacterial wilt, soft rot), rose (black spot, powdery mildew), gerbera (alternaria leaf blight, powdery mildew), tulip (basal rot, penicillium rot, grey mould rot).

Section – VI Marks: 10

Agricultural Entomology

Introduction to phylum arthropoda. Importance of class Insecta. Insect dominance. Definition, division and scope of entomology. Types of mouth parts, antennae, legs and wings. Metamorphosis. Classification of insects up to orders

Definition, economic importance. General characters of plant parasitic nematodes, symptomatology and control of important plant parasitic nematodes of fruits - (subtropical and temperate) and vegetable crops

economic classification of insects; Distribution, host range, bio-ecology, injury, integrated management of important insect pests affecting sub-tropical and temperate fruits, Storage insects-host range, bio-ecology, injury, integrated management of important insect pests attacking stored fruits, Toxicology-insecticide residue problems in fruit and their tolerance limits.

Economic importance of insects in vegetable crops. Distribution, host range, bio-ecology, injury, integrated management of important insect-pests affecting vegetable and ornamental crops. Important storage insect pests of vegetable and ornamental crops, their host range, bio-ecology, injury and integrated management. Insecticidal residue problems in vegetables, Tolerance limit.

Introduction of Bee keeping, important Bee flora, Bee keeping equipments, differentiation of bee castes.

Section: VII Marks: 10

Post Harvest Technology

Maturity indices, harvesting, handling, grading of fruits, vegetables and cut flowers. Factors responsible for deterioration of horticultural produce, physiological and bio-chemical changes, hardening and delaying ripening process. Methods of storage for local market and export. Pre-harvest treatment and precooling, pre-storage treatments. Different systems of storage, packaging methods and types of packages. Types of containers and cushioning materials, vacuum packaging, cold storage. Poly -shrinks packaging.

Importance and scope of fruit and vegetable preservation industry in India, losses in post-harvest operations, unit operations in food processing. Principles and methods of preservation by heat. Canning and bottling. Methods of preparation of juices. Squashes, syrups, cordials, fermented beverages, jam, jelly, marmalade, pickles, chutneys and sauces. Preservation by sugar and chemicals; candies, crystallized fruits, preserves, chemical preservatives, preservation with salt and vinegar. Freezing. Govt. policy on import and export of processed fruits. Food laws.

Classification, functions, deficiency and sources of Carbohydrates, Protein and Lipids. Mineral nutrition: macro and micro-minerals (Ca, Fe and P), function, utilization, requirements, sources, deficiency. Vitamins: functions, sources, deficiency, requirements of water soluble and fat-soluble vitamins. Recommended dietary allowances for various age groups.

Section VIII Marks: 10

Biotechnology

History of biotechnology. Fundamental principles: micro-propagation and scope for commercialization. Application of micro-grafting in horticultural crops, meristem culture, anther culture, pollen culture, embryo culture, callus culture, cell culture, somaclonal variation, protoplast isolation, culture, fusion and applications. Cryopreservation .Genetic engineering. Future scope and present trends. Importance of biotechnology in horticulture.

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ANNEXURE "D"

Syllabus for Written test

Marks =120 120 Minutes

1. Surveying: 10 Marks

Importance of surveying, principles and classifications, measurements of distance and directions, chain surveying, compass surveying, leveling, tachometry, theodolite, traversing, contouring, plane table surveying, curves.

2. Mechanics and Structural analysis: 15 Marks

Introduction, Concept of rigid body scalar and vector quantities, Laws of force, moment, friction, Centre of gravity, simple machines, torsion, Properties of material, Bending moment and shear force in statically determinate beams. Simple stress and strain relationship. Stress and strain in two dimensions, principal stresses, stress transformation. Simple bending theory, flexural and shear stresses, unsymmetrical bending, shear Centre. Thin-walled pressure vessels, uniform torsion, buckling of column, combined and direct bending stresses. slope and deflection, Analysis of trusses

3. RCC Structures: 15 Marks

Concrete technology, Ingredients of concrete, water cement ratio, workability properties of concrete, admixtures, special concretes, Nondestructive tests, basics of mix design. Concrete design-basic working stress and limit state design concepts, analysis of ultimate load capacity and design of members subjected to flexure, shear, compression and torsion by limit state methods. Basic elements of pre-stressed concrete, analysis of beam sections at transfer and service loads, one-way slab, two-way slab.

4. Soil Mechanics: 10 Marks

Origin of soils, properties, soil classification, three phase system, fundamental definitions, relationship and interrelationship, flow of water through soils, permeability & seepage, effective stress principle, deformation of soils, consolidation, compaction, shear strength characteristics, plate load test, SPT, Density control, Measurement of field density by core cutter and sand replacement method, soil exploration, bearing capacity and its methods

5. Fluid Mechanics and Hydraulics: 1 5 Marks

Properties of fluids, hydrostatic pressure, measurement of pressure, flow measurements, flow through pipes, flow through open channels, hydraulic pumps, principle of conservation of mass, momentum, energy and corresponding equations, potential flow, applications of momentum and Bernoulli's equation, laminar and turbulent flow, flow in pipes, pipe networks. Concept of boundary layer and its growth. Uniform flow, critical flow and gradually varied flow in channels, specific energy concept, hydraulic jump Forces on immersed bodies, flow measurements in channels, tanks and pipes. Dimensional analysis and hydraulic modeling Kinematics of flow.

6. Irrigation Engineering: 10 Marks

Introduction, water requirement of crops, hydrological cycle, Dams, Canals, dams, canal head works and regulatory works, cross drainage works, hydraulic structures, river training works, water-logging, drainage, ground water recharge, well hydraulics.

7. Water supply and waste water Engineering: 10 Marks

Introduction, quantity of water, quality of water, water treatment, conveyance of water, laying out of pipes, building water supply, water supply fixtures and installation, plumbing, sewerage system, laying and construction of sewers, sewage characteristics, Methods of disposal, sewage treatment, building drainage, air and noise pollution

8. Highway Engineering: 10 Marks

History of development of highway and planning, Definitions of various terms used in highway engineering., Methods of road construction, IRC classification, Highway surveys and plans Geometric design, Different types of road materials in use, Binders, Types of pavement, CBR method, sub grade preparation, WBM, WMM, Bituminous Macadam, dense bituminous macadam, special problems in hill road.

9. Railway Engineering: 10 Marks

History of Indian railways, Gauges used, permanent way its components, Types of rails, creep, welding, Rail fixtures and fastenings, Signaling, Points and Crossings, Bridge terminology, classification, components, foundations.

10. Construction planning management: 15 Marks

Network diagrams, PERT-CPM, cost optimization contracts, tenders, depreciation, valuation, organization, measurement books, cash book, functions of management, construction planning, quality control, inventory control, Estimation and costing definitions, methods of estimation and type of estimates.

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Annexure "E"

Syllabus for Written Test (Objective Type)

Marks: 60 Time: 60 Minutes

S. No.	Subjects/ Topic	Marks assigned
1	GENERAL AWARENESS with Special reference to J&K UT	20
2	GENERAL ENGLISH & COMPREHENSION	20
3	GENERAL INTELLIGENCE & REASONING	10
4	COMPUTER APPLICATIONS	10
TOTAL		60

1. GENERAL AWARENESS with special reference of J&K UT.
   (i) Current Events of National and International importance
   (i) Political & Physical divisions of India
   (ii) Indian Culture, Heritage and Freedom Struggle/Movement.
   (iii) Demography- Census, its feature and functions.
   (iv) Important Rivers & Lakes in India.
   (v) Weather, Climate, Crops, Means of Transport of India.
   (vi) J&K UT
      a) History
      b) Economy
      c) Geography- (Weather, Climate, Crops, Rivers, Lakes, Flora, Fauna etc.)
      d) Heritage & Culture
      e) Important Tourist Destinations
2. GENERAL ENGLISH & COMPREHENSION
   (i) Tenses
   (ii) Narration
   (iii) Modals
   (iv) Articles
   (v) Reading Comprehension
   (vi) Fill in the blanks with Phrases, Pronouns, homonyms/ homophones etc
   (vii) Clauses
   (viii) Synonyms and antonyms
   (ix) Pairs of words and their use in meaningful sentences.
   (x) Rearranging of jumbled sentences.
   (xi) Idioms and phrases.
   (xii) Uses of Prepositions.
   (xiii) Active & Passive Voice
   (xiv) Error Spotting
   (xv) Sentence Correction
   (xvi) Spellings Correction

3. GENERAL INTELLIGENCE & REASONING

(i) Number series, Letter series, Semantic Series, Speed, Distance and Time, Statements and conclusions, Logical Reasoning, Mental Reasoning, Word Building, Numerical Operations, Semantic Analogy, Symbolic/ Number Analogy, Figural Analogy, Semantic Classification, Symbolic/ Number Classification, Figural Classification, Problem Solving.

(ii) Symbolic Operations, Trends, Space Orientation, Space Visualization, Venn Diagrams, Drawing inferences, Punched hole/ pattern- folding & un-folding, Figural Pattern- folding and completion, Indexing, Address matching, Date & city matching, Classification of centre codes/roll numbers, Small & Capital letters.

4. COMPUTER APPLICATIONS

(i) Basic Applications of Computer and its component.
(ii) Fundamentals of computer sciences.
(iii) Hardware & Software, Concept of Open-Source Technologies.
(iv) Input & output Devices.
(v) Knowledge of MS Word, MS Excel, MS Access, MS PowerPoint, PDF Internet and E-mail.
(vi) Concept of Computer Virus and Latest Anti-Virus.
(vii) Terms and Abbreviation used in IT.
(viii) Role of Information Technology in Governance

Annexure "F"

Syllabus for Written test (Objective Type)

Marks: 80 Time: 80 Minutes

Unit I General English 20 Marks

(i) Comprehension
(ii) Editing / Proof Reading.
(iii) Rearranging of jumbled sentences
(iv) Narration
(v) Modals
(vi) Articles
(vii) Paragraph writing with blanks to be filled in with the following
  i. Phrases
  ii. Pronouns
  iii. Homonyms/Homophones etc.
(viii) Clauses
(ix) Punctuation
(x) Synonyms and antonyms
(xi) Idioms and phrases.
(xii) Uses of Prepositions
(xiii) Active & Passive Voice

Unit II General Awareness with special reference to JK UT 20 Marks

(i) Current Events of National and International importance
(ii) Political & Physical divisions of India
(iii) Indian Culture, Heritage and Freedom Struggle/Movement.
(iv) Demography- Census, its feature and functions.
(v) Important Rivers & Lakes in India.
(vi) Weather, Climate, Crops, Means of Transport of India.
(vii) J&K UT
  a) History
  b) Economy
  c) Geography- (Weather, Climate, Crops, Rivers, Lakes, Flora, Fauna etc.)
  d) Heritage & Culture
  e) Important Tourist Destinations

Unit III Numerical and Reasoning Ability 20 Marks

Basic Arithmetic:

(i) Number System
(ii) Percentage
(iii) Average
(iv) Profit & Loss
(v) Ratio & Proportion
(vi) Time & Work

Reasoning:

(i) Number series
(ii) Letter series
(iii) Coding decoding
(iv) Direction sense
(v) Blood relations
(vi) Mathematical reasoning
(vii) Speed, Distance and Time
(viii) Statements and conclusions.

Unit IV Basic Concepts of Computers 20 Marks

(i) Fundamentals of computer sciences
(ii) Hardware & Software
(iii) Input and output devices
(iv) Operating system
(v) M.S Word,M.S Excel, M.S Acess and Powerpoint Presentation
(vi) E_mail & Internet

Annexure "G"

Syllabus for written test

Marks: 120 *Time: 02.00 Hrs.*

Unit-I GENERAL ENGLISH 15 Marks

(i) Paragraph writing / Comprehension
(ii) Editing / Proof Reading.
(iii) Rearranging of jumbled sentences
(iv) Dialogue
(v) Narration
(vi) Models
(vii) Articles
(viii) Paragraph writing with blanks to be filled in with the following
  i. Phrases
  ii. Pronouns
  iii. Homonyms / homophones.
(ix) Clauses
(x) Punctuation
(xi) Synonyms and antonyms
(xii) Pairs of words and their use in meaningful sentences.
(xiii) Idioms and phrases.
(xiv) Uses of Prepositions

Unit-II MATHEMATICS 15 Marks

(i) Problems on finding Surface areas and volumes of combinations of any two of the given cubes, cubiods, spheres, hemispheres and right circular cylinders / cones. Frustum of a cone.
(ii) Problems involving converting one type of metalic solid into another and other mixed problems.
(iii) Profit and loss
(iv) Simple / Compound interest.
(v) Linear equations with two variables.
(vi) Progression / BODMAS
(vii) Probability: Simple problems on Single event.

Unit-III HISTORY 15 Marks

(i) Revolt of 1857 - Causes and Effects.
(ii) Rise of National Movement - Factors.
(iii) Formation of the Indian National Congress in 1885 and Role of Moderates.

(iv) Factors leading to the rise of Exremism in the Congress with special reference to the Partition of Bengal.
(v) Important dates and historical events with reference to India
(vi) Boycott and Swadeshi Movement.
(vii) Rise of Muslim League in 1906 : Cause.
(viii) Khilafat Movement and the Non-Cooperation Movement.
(ix) Quit India Movement.
(x) Independence and Partition of India.

Unit-IV CIVICS 15 Marks

(i) Origin of democracy and its types. Direct and Indirect Democracy, Hindrance to Democracy
(ii) Fundamental Rights.
(iii) Fundamental duties.
(iv) Directive Principles.
(v) Public opinion.
(vi) Representaion.
(vii) Franchise.
(viii) Secret Ballot.
(ix) Nomination.
(x) Symbol.
(xi) The Campaign
(xii) Presidential elections.
(xiii) Languages
(xiv) Cities and Villages.
(xv) The United Nations.

Unit-V GEOGRAPHY 15 Marks

(i) Change of Seasons/ Planets/ Solar System/ Longitude - Latitude.
Types of forests (with special reference of UT of J&K)
(ii) Conservation and protection of forests.
(iii) National / Zoological Parks and wildlife sanctuaries (Reference of J&K Sanctuaries and National Parks).
(iv) Water resources. Sources of Water (with special reference of UT of J&K)
(v) Resources. Conservation and management of water resources.
(vi) Rainwater Harvesting.
(vii) Roads (Different routes of UT of J&K)

Unit-VI GENERAL KNOWLEDGE AND CURRENT AFFAIRS 20 Marks

(i) Abbreviations
(ii) Popular Personalities
(iii) Geographical Discoveries
(iv) Principal Languages of India
(v) Capitals and Currencies of Countries

(vi) International Organisations- UNO, WHO, WTO, IMF, UNESCO, UNCTAD etc.
(vii) Important Regional Organizations and Blocs- BRICS, OPEC, ASEAN, SAARC, BIMSTEC, G-20, G-7 etc.
(viii) Space Programme of India
(ix) India's Automic Research Programme
(x) Honours and Prizes, Seven Wonders.
(xi) The World of Sports
(xii) Exports and Imports
(xiii) GDP, GNP, Per capita Income etc
(xiv) Thermal / Nuclear/ Hydro Power Plants in India.

Unit-VI GENERAL KNOWLEDGE WITH SPECIAL REFERENCE to UT of J&K 15 Marks

(i) Popular names of personalities and their achievements/ Contribution (National and International).
(ii) Weather, Climate, Crops, Means of Transport.
(iii) J&K History, Economy and Culture
(iv) Flora and Fauna of J&K
(v) Rivers and Lakes.
(vi) Important Tourist Destinations.
(vii) J&K Panchayati Raj Act, 1989 (as ameneded upto December, 2020), 73rd & 74th Constitutional amendments.
(viii) J&K Reorganisation Act, 2019

Unit-VIII MENTAL ABILITY TEST 10 Marks

(i) Number series
(ii) Letter series
(iii) Coding decoding
(iv) Direction sense
(v) Blood relations
(vi) Mathematical reasoning
(vii) Speed, Distance and Time
(viii) Statements and conclusions

Annexure “H”

Syllabus for Written Test (Objective Type).

Total Marks=120
Time=02 Hours

1) Basis Mathematics =30 Marks

- Percentage
- Average
- Time, Work and Distance
- Ration and Proportions
- Problem of Age
- Probability
- LCM, HCF
- Mensuration

2) Basis Reasoning =30 Marks

- Analogies
- Relationship concepts
- Figure odd one out
- Direct Sense
- Figure Series completion
- Venn Diagram
- Number series
- Coding/Decoding

3) Basis English =30 Marks

- Articles
- Synonyms
- Antonyms
- Preposition
- Verbs
- Reading comprehension
- Determiners
- Spellings

- Sentences

4) General Awareness and Science =30 Marks

- General current events (National Level)
- Sports
- India culture
- India history
- Indian geography
- Capital/State
- General Science
- Health, Hygiene and Sanitation
- Geography of Jammu and Kashmir
- Culture of Jammu and Kashmir
- History of Jammu and Kashmir

ANNEXURE "I" **Marks :-120** **Time :- 2.00 Hours**			
Syllabus for the post of Drivers			
Name of Post		Light Motor Vehicle/ Heavy Motor Vehicle	Marks allotted
Driver	Topic	Subtopic	
	Traffic Rules and Signalling	Basic Road Rules, driving methods and speed limits	10
		Understanding Signals: 1.Traffic Police hand signals 2.Hand signals while driving 3.Traffic light signals 4.Road map reading	15
		Knowledge of traffic signage's for road safety	10
		Fitness to drive: 1.First aid kit 2.Good health & Road safety 3.Driving under influence of drugs/liquors	15
		Difficult driving condition: 1.Driving on wet surface 2.Driving in fog 3.Night driving 4.Running on pavement 5.Brake failure 6.Towing	10
		Basic knowledge about provisions of the Motor Vehicle Act	10
		Essential knowledge about vehicle pollution (Do's and Don't's)	10

		Awareness about documents required for driving and offence related 1.Registration 2.Licensing 3.Insurance.	15
Driver	Motor parts and its repair	Identification of major assemblies of vehicle	25
		Knowledge of daily and periodic inspection	
		Knowledge of fault diagnosis in tyre and its changing procedure	
		Knowledge of fuel pump, clutch and brake working and their air bleeding procedure	
		Lubrication grades used in vehicle for engine, transmission, differential, suspension	
		Knowledge about servicing schedule and service centres location	
		Knowledge of different starting methods	
		Knowledge of dash board's symbols	

Annexure "J"

Syllabus for the post of Deputy Inspector Fisheries and Fisheries Development Assistant.

I. Principles of taxonomy

Nomenclature, types Classification and interrelationships. Criteria for generic and specific identification. Morphological, morphometric and meristic characteristics of taxonomic significance. Major taxa of inland and marine fishes up to family level. Commercially important freshwater and marine fishes of India and their morphological characteristics. Introduction to modern taxonomic tools: karyotaxonomy, DNA barcoding, protein analysis and DNA polymorphism. Study of external morphology and meristic characteristics of crustacea and mollusca. Classification of crustacea and mollusca up to the level of species with examples of commercially important species.

II. Anatomy and Physiology of vertebrates with special reference to finfish

Integumentary System: Derivatives of integument; Skeletal System, Evolution of visceral arches; Digestive System; Respiratory System; Circulatory System; Excretory system.

III. Classical and Molecular Genetics

Mendalian genetics. Linkage, Linkage maps and crossing over ; Nature of heterochromatin; Organisation of genetic material in prokaryotes and eukaryotes. Multiple alleles, Lethality, Epistasis, Sex linked inheritance, Extra chromosomal Inheritance; Mutations: Structural and numerical changes in chromosomes; Gene mutations; Replication: Replication in prokaryotes and eukaryotes; Transcription and translation: Transcription and post transcriptional modifications, Translation; Sex Determination, Chromosomal mechanisms, Dosage compensation; Principles of genetics and breeding, Gene and chromosome as basis of inheritance, Mendel's law of inheritance – complete and incomplete dominance, monohybrid and dihybrid ratios. Gene interactions – dominant and recessive epistasis. Pleiotropism. Lethal genes.

IV. Fresh water Aquaculture

Major species cultured, production trends and prospect in different parts of the world. Freshwater aquaculture resources-ponds, tanks, lakes, reservoirs etc. Nursery, rearing and grow-out ponds preparation and management-control of aquatic weeds and algal blooms, predatory and weed fishes, liming, fertilization/manuring, use of biofertilizers, supplementary feeding. Water quality management. Selection, transportation and acclimatization of seed. Traits of important cultivable fish and shellfish and their culture methods-Indian major carp, exotic carp, air breathing fish, cold water fish, freshwater prawns.

V. Limnology

Introduction to limnology: inland water types, their characteristics and distribution; ponds and lakes; streams and rivers; dynamics of lentic and lotic environments. Lakes - their origin and diversity. Famous lakes of India with special reference to J&K; nature of lake environment; morphometry, physical and chemical conditions and related phenomena; biological relations: influence of physical and chemical conditions on living organisms in inland waters. Plankton: planktonic organisms; classification of plankton; distribution of plankton: geographic, vertical, horizontal and seasonal distribution of phytoplankton and zooplankton; seasonal changes of body form in planktonic organisms; food of planktonic organisms; primary productivity.

VI. Aquatic ecology and Biodiversity

Aquatic environment, Flora and fauna: Components of aquatic systems, Aquatic productivity, nutrient cycles, energy flow, food chain. Animal associations:

parasite relationship. Aquatic biodiversity-its importance, species diversity, genetic diversity, habitat diversity, diversity indices. Ecological and evolutionary processes. Ecological niches – lagoons, estuaries, mangroves, coral reefs, flood plains, coastal wet lands, bheels, oxbow lakes. Threats to biodiversity- habitat destination, introduction of exotic species, Conservation of habitats, marine parks and sanctuaries. Conservation programmes for endangered species, *ex situ* and *in situ* conservation, captive breeding and management of endangered species. Various national and international conventions and regulations concerning biodiversity, including use of selective gears and exclusion devices.

VII. Fish Nutrition and Biochemistry

Fundamentals of fish nutrition and growth in fish. Principal nutrients and nutritional requirements of cultivable fish and shellfish. Nutritional energetics: definition and forms of energy partitioning. Methods of feed formulation and manufacturing. Forms of feeds: wet feeds, moist feeds, dry feeds, mashes, pelleted feeds, floating and sinking pellets. Feed additives: binders, antioxidants, enzymes, pigments, growth promoters, feed stimulants. Feed storage: use of preservatives and antioxidants. Feed evaluation: feed conversion ratio, feed efficiency ratio, protein efficiency ratio, net protein utilization and biological value. Feeding devices and methods. Non-conventional feed ingredients and antinutritional factors. Digestive enzymes, feed digestibility. Factors affecting digestibility. Nutritional deficiency diseases. Carbohydrate metabolism: Glycolysis, Krebs-cycle, Pentose phosphate pathway, Gluconeogenesis, Glycogen metabolism, Electron transport chain; Lipid metabolism: Biosynthesis and β oxidation of palmitic acid. Protein metabolism: Transamination, deamination and urea cycle Enzymes: Introduction, Mechanism of action, Enzyme Kinetics, Inhibition and Regulation

VIII. Hill stream Fisheries

Introduction, Ecology and classification of hill streams. Geographical features, Drainage pattern, Climate and seasons with special reference to Himalayan Hill streams. Check list of some important hill streams. Biodiversity of hill stream fishes of Jammu, Kashmir and Ladakh. Grouping of hill stream fishes as per Menon (1954). Modifications in the hill stream fish fauna (External shape and form of the body, Scales, position of the mouth and lips, barbles, paired fins, caudal fin and caudal peduncle, eyes, gill apertures, and branchiostegal rays, skeleton, air bladder), adhesive apparatus, histological structure and mechanism of adhesion. Food of hill stream fishes. Primary and secondary productivity in hill streams. Evolution, distribution and origin of hill stream fishes. Fish culture in hill streams.

IX. Hatchery Management

Freshwater and marine fish seed resources. Natural breeding of finfishes. Selection of riverine spawn collection sites, gears used and methods of collection. Spawn quality and quantity indices. Advantages and disadvantages of riverine seed collection. Sexual maturity and breeding season of various cultivable species. Development of gametes in male and female. Fish egg and embryonic development. Methods of breeding; bundh breeding - wet and dry bundhs, collection and hatching of eggs, factors involved in bundh breeding, advantages and disadvantages of bundh breeding. Induced breeding of warmwater finfishes, environmental factors affecting spawning, sympathetic breeding. Hypophysation of fishes. Fish pituitary gland – its structure, collection, preservation and preparation of extract for injection, dosages and methods of injection. Brood-stock management and transportation of brood fish. Synthetic hormones used for induced breeding of carps. Different types of fish hatcheries-traditional, Chinese, glass jar and modern controlled hatcheries. Causes of mortalities of eggs and spawn and remedies. Spawn rearing techniques. Use of anaesthetics in fish breeding and transport. Breeding techniques for Indian major carp, exotic carp. mahaseer, trout, tilapia, catfish.

X. Sport Fisheries

Present status and future prospects of cold-water sport fishing. Different species of cold-water sport fishes and their natural breeding habit, ecology and behaviour. Different sport fishing techniques of fly fishing, spinner fishing and bait fishing. Casting/flipping/pitching, rigging, fish handling, live baits, rod and reel maintenance and repair, seasonal fish patterns, water and sun safety. State regulations governing sport fishing and management practices that maintain healthy fish populations.

XI. Fish Preservation, Processing and Value addition

Principle of fish preservation and processing. Processing of fish by traditional methods– salting, sun drying, smoking, marinating and fermentation. Theory of salting, methods of salting–wet salting and dry salting. Drying and dehydration-theory, importance of water activity in relation to microbial growth. Sun drying and artificial drying- solar dryer. Packaging and storage of salted and dried fish. Different types of spoilage in salt cured fish. Quality standard for salted and dry fish. Fish preservation by smoking-chemical composition of wood smoke and their role in preservation. Methods of smoking and equipments used for smoking. Carcinogenic compound in wood and methods to remove them. Hurdle technology in fish preservation and processing. Marinated and fermented fish products–role of acids in marinades, Fish and prawn pickles, fish sauce and Fish paste, traditional Indian fermented products.

XII. Fish Diseases, Diagnosis and Treatment

Introduction fish diseases. Common diseases of cold-water fish spp. Haemato-biochemical profile in fish disease. Immune system of fish; cell mediated, humoral immunity, non-specific immune system. Effect of environment on fish immune system. Important bacterial and Fungal diseases of cold-water fishes. Parasitic diseases of cold-water fishes; ecto and endo parasites, monogenetic and digenetic trematodes, black spot disease. Cestodiasis; Nematodiasis; Acanthocephalosis; Protozoon infections. Argulosis and other crustacean mediated diseases Diseases due to environmental stress. Host-pathogen interaction in fish. Disease surveillance, diagnosis, and treatment.

Annexure "K"

Syllabus for the post of Inspector Fisheries

I. Animal taxonomy

Systematics: terms & definitions, strategies of research in systematics, future of systematics; taxonomic characters: definition and kinds - morphological, physiological, molecular, ecological, behavioural and geographical; curating of collections: preparation of material, housing, cataloguing, arrangement of collection, curating of types, exchange of material and loans; taxonomic keys: definition and kinds- bracket key, indented key and pictorial key.

II. Trends in taxonomy

Cytotaxonomy: back ground, chromosome evolution with specific reference to primates and grasshoppers; molecular taxonomy: concept of phylogenetic systematics; phylogenetic tree reconstruction; DNA bar coding concept and significance; tools for sequence annotation: NCBI (Gene bank), Nucleotide BLAST, Alignment & sequence analysis, MEGA & Phylogenetic tree.

III. Invertebrates

- Protozoa and Porifera

Classification of protozoa up to order level; nutrition, locomotion, reproduction and economic importance of protozoa; classification of porifera up to order level; canal system, skeleton in porifera, reproduction and development; economic importance of porifera.

- Annelida and Arthropoda

Classification of Annelida up to order level; adaptive radiation in polychaetes; nervous system in annelids; economic importance of annelids; classification of Arthropoda up to order level; respiration in arthropods (aquatic & terrestrial); crustacean larvae & their evolutionary significance; economic importance of Arthropoda.

IV. Fish Farming/ Aquaculture

- Culture of air breathing fishes; brackish water fish culture; prawn culture; pearl culture; Carp culture; trout culture; composite fish culture; integrated fish farming;
- Hatchery management of economically important fish; Operation, management and hatchery technology for seed production; Seed packaging and transportation methods; Synthetic hormones and analogues for induced spawning

V. Resource management in Cold water fisheries

History of cold-water fisheries in India; Cold water fisheries resources of India; Important cold water fish species; Status of cold-water fisheries; River systems: origin and ecology; Effect of human intervention in rivers; Ecology of lakes and lake fisheries; Types of Lakes; Wetlands; Definition, types, structure and management of wetland ecosystem; Conservation and management of wetland; Impact of climate change on cold water fisheries.

VI. Fish anatomy, physiology and biology

Taxonomy of cold-water fishes- meristic and morphometric; General characteristics of fish; Fish diversity and adaptation; Methods of fish identification (Morphometric and meristic); Skin and coloration; Types of fins; Types of scales; Classification and identification of important cold-water fishes; Anatomy & Physiology of cold-water fishes; Biology of cold-water fishes including their habitat, food and feeding habits, growth, maturity, fecundity; Reproductive and endocrine system; Male and female reproductive system of fishes; Sexual maturity and maturity stages of gonads; Migration of fishes; Spawning; Fecundity of fishes and methods of estimation of fecundity; Types of fish eggs; Embryonic development of fish; Hatching and development of fish larvae

VII. Diseases in fish and their control

Introduction to various fish diseases; Viral diseases; Bacterial diseases; Fungal diseases; Parasitic diseases; Causative agents, symptoms, prophylaxis; Non infectious diseases; Identification and collection of samples for disease investigation; Disease control & Management; Management of culture system and environmental stress; Principles of disease diagnosis; Epidemiological and clinical diagnosis; Microbiological and post mortem examination of fin fishes in freshwater.

VIII. Sport fisheries

Fishing tackle and fishing techniques; Scope of sport fisheries in Jammu & Kashmir; Sport fishing and the tourism industry; Management, development and conservation.

IX. Fish Nutrition/ Biochemistry

Nutritional requirements; Role of Protein and amino acids, lipids, carbohydrates, amino acids, vitamins and minerals, additives, practical diets; Classification and metabolism of proteins, lipids and carbohydrates; Role of nutrients like amino acids, fatty acids, proteins, lipids, carbohydrates, vitamins and minerals. Energy requirement of fishes; Feed resources; Contribution from natural food to nutrient requirements of fish, Feed additives (attractants, growth stimulants and probiotics and binders), and Feed resources assessment; Classification of feed ingredients. General principle of feed formulation; Methods of feed formulation: Pearson's method, quadratic equation linear programming, limitations. Types of feed; Feeding practices.

Annexure "L"

Jammu & Kashmir Energy Dev. Agency
Science and Technology Department

Syllabus: **Technical Officer**

Civil Engineering: Civil Engineering: Forces and moments, Centroid, Moment of Inertia, Strength of material; types of stresses and strains, Mechanics of Solids: Strain energy, toughness, hardness, fatigue, creep and so on. Shear force and Bending moment diagram, Columns, Surveying, Hydraulics: Fluid properties, continuity equation. Bernoulli's theorem, Reynold's number for laminar and turbulent flows, Classification of Turbines - Kaplan, Francis and Pelton wheel turbine. Different systems of classification of soils, Transportation Engineering: Classification of roads as per I.R.C, Cautionary signs. Highway constructions and maintenance, Importance of Railways, Traffic census and its importance, water supply and sanitary engineering, Sources and conveyance of water, System of sewage disposal, Types of the sewages, Quality of discharge in sewers, dry weather flow and variability flow, Different cross sections of sewers, strength of sewage and characteristics of sewage, Waste water treatment.

Mechanical Engineering: Laws of Forces, Moment, Friction, Moment of Inertia, Centre of Gravity. Thermodynamics: Fundamental Concepts, Laws of Perfect Gases. Fluid Mechanics: Type and Properties of Fluids, Pressure and its Measurement, Flow of Fluids and Flow through Pipes. Theory of Machines: Simple Mechanisms, Friction, Power Transmission, gyroscope, Flywheel, Governor and Balancing. Heat-Transfer: Modes of Heat Transfer. Machining and Machine Tool Operations: Cutting Tools and Cutting Materials, Lathe, Drilling, Boring, Shaping, Planing, and so on. Pattern Making, Metal Forming. Engineering Materials: Scope of Material Science, Metals and Alloys, Heat Treatment, Advanced Materials. Machine Design: Types of design, necessity of design, Design terminology: stress, strain, factor of safety, factor of safety. Automobile Engineering. Automobile and its development, Classification of automobiles, Transmission System, System, Braking System, Dynamo and Alternator and Exhaust system, Introduction to NC, CNC & DNC, Construction and Tooling, Part Programming, System Devices, Problems in CNC Machines, Automation and NC. I .C. Engines: Working principle of two stroke and four stroke cycle, SI engines and CI Engines, Otto cycle, Diesel cycle, Dual cycle, Fuel Supply and Ignition System in Petrol Engine, Fuel System of Diesel Engine, Cooling and Lubrication and Testing of IC Engines. Refrigeration and air-conditioning: Fundamentals of Refrigeration, Vapour Compression System, Refrigerants, Vapour Absorption System and Refrigeration Equipment. Turbo-machinery: Introduction to Turbo-machines, Steam Turbines and Steam Condensers, Gas Turbines and Jet propulsion.

Electrical Engineering: Concept of resistance, inductance and capacitance, Ohm's Law, Node and mesh analysis, Superposition theorem, Thevenin's theorem, Norton's theorem, Maximum power transfer theorem, reciprocity theorem, Coulomb's Law, Electric Field Intensity, Electric Flux Density, Gauss's Law, Divergence, Electric field and potential due to point, line, plane and spherical charge distributions, Ampere's law, Curl, Faraday's law, Lorentz force. Signals and Systems: Representation of continuous and discrete time signals, Shifting and scaling operations, Applications of Fourier Transform, Laplace Transform. Electrical Machines: Single phase transformer: equivalent circuit, phasor diagram, open circuit and short circuit tests, regulation and efficiency; Three phase transformers: connections, vector groups, parallel operation; Auto-transformer, Electromechanical energy conversion principles, DC machines: separately excited, series and shunt, motoring and generating mode of operations and their characteristics, starting and speed control of DC motors; Single phase induction motor: Operating principle, starting, torque-speed characteristics, speed control; Three phase induction motor: principle of operation, types, performance. Power Systems: Power generation concepts, Models and performance of transmission lines and cables, Series and shunt compensation, Electric field distribution and insulators. Analog and Digital Electronics: Characteristics of diodes, BJT, MOSFET; Simple diode circuits, A/D and D/A converters, 8085Microprocessor: Architecture, Programming and interfacing. Power Electronics: Characteristics of power semiconductor devices: Diode, Thyristor, TRIAC, GTO, IGBT; Rectifiers: Uncontrolled, Controlled, Single-phase and Three-phase; DC to DC converter and AC to DC converter. Control Systems: Basic control system components, open-loop and closed-loop systems and Block diagram reduction techniques.

Dr. H S Pali	Dr. Omkar Singh	Dr. Ravi Bhushan	Dr. Abdullah Ahmad
Mechanical & Renewable Engg.	E&C Engg	Electrical Engg	Civil Engineering

E&C Engineering: Noda. and mesh analysis; Network theorems: superposition, Thevenin and Norton's, maximum power transfer; Wye-Delta transformation; Steady state sinusoidal analysis using phasors; Time domain analysis of simple linear circuits; Laplace transform and its applications; Linear 2-port network parameters. Continuous-time signals: Fourier series and Fourier transform representations, sampling theorem; Discrete-time signals: discrete-time Fourier transform (DTFT), DFT, FFT, Z-transform. LTI systems: definition and properties, causality, stability, impulse response, convolution, poles and zeros, parallel and cascade structure, frequency response, FIR and IIR filter design techniques. Intrinsic and extrinsic semiconductors; diffusion current, drift current, mobility and resistivity; Generation and recombination of carriers; P-N Diode, Zener diode, BJT, MOSFET, LED, photo diode and solar cell; Diode circuits: clipping, clamping and rectifiers; Single-stage BJT amplifiers: biasing, bias stability, Power amplifiers; feedback amplifiers; Operational amplifiers;; Active filters; Sinusoidal oscillators: criterion for oscillation; wave-shaping circuits and 555 timers; Voltage reference circuits; Power supplies: Number systems; Combinatorial circuits: Boolean algebra, Karnaugh map, logic gates; arithmetic circuits, code converters, multiplexers, Encoders and decoders; Sequential circuits: latches and flip-flops, counters, shift-registers and finite state machines; sample and hold circuits, ADCs and DACs; 8085 architecture, programming, memory and I/O interfacing. Basic control system components; Feedback principle; Transfer function; Block diagram representation; Signal flow graph; Transient and steady-state analysis of LTI systems; Frequency response; Routh-Hurwitz and Nyquist stability criteria; Bode and root-locus plots; Analog communications: AM and FM, spectra of AM and FM, super heterodyne receivers, circuits for analog communications; Information theory: entropy, mutual information and channel capacity theorem; Digital communications: PCM, DPCM, digital modulation schemes, amplitude, phase and frequency shift keying (ASK, PSK, FSK), QAM, MAP and ML decoding, matched filter receiver, Fundamentals of error correction, Hamming codes; Timing and frequency synchronization, inter-symbol interference and its mitigation; Basics of TDMA, FDMA and CDMA. Maxwell's equations: Transmission lines: Waveguides: modes, boundary conditions, cut-off frequencies, dispersion relations; Antennas radiation pattern, gain and directivity, antenna arrays; optical fibers.

Renewable Engineering: Solar Energy: source of energy, direct solar energy utilization; solar thermal applications. Wave energy generation ocean thermal energy conversion (OTEC); methods of ocean thermal electric power generation. Wind energy: Basic principles of wind energy conversion; design of windmills; wind data and energy estimation; site selection considerations. Hydro power: Classification of small hydro power (SHP) stations; description of basic civil works design considerations; turbines and generators for SHP; advantages and limitations. Biomass and bio-fuels: Energy plantation; biogas generation; types of biogas plants; applications of biogas; energy from wastes. Energy conservation management: The relevance of energy management profession; general principles of energy management and energy management planning.

General: Basic English grammar: tenses, articles, adjectives, prepositions, verb-noun agreement, and other parts of speech Basic vocabulary: words, idioms, and phrases in context Reading and comprehension Narrative sequencing. Basic knowledge of Computer Applications, viz; MS Word, MS Excel, Power Point etc. Internet, MS-DOS, UNIX, Windows, Data Entry, Software knowledge, Networking Platforms, applications of computers in mechanical/Industrial/Production engineering.

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