

J.S. University, Shikohabad (U.P.)

M.Sc. (Ag.) Previous and Final Year

Horticulture

Note- Any three papers may be taken in one year provided that Paper III (Ag. Statistics) is taken in the previous examination, and Paper VI or Thesis is taken in the Final Examination. Research work for Thesis may be begin in Previous year.

PAPER	Title of Paper	MAX. MARKS
PAPER-I	VEGETABLE SCIENCE	100
PAPER-II	FLORICULTURE AND ORNAMENTAL GARDENING	100
PAPER-III	AGRICULTURAL STATISTICS	50
PAPER-IV	FRUIT SCIENCE	100
PAPER-V	PRODUCTION OF FRUITS AND PLANTATION CROPS	100
PAPER-VI	FRUIT TECHNOLOGY OR Thesis	100

Paper I- Vegetable Science

(100 marks)

Unit I

Importance, area, production and productivity of vegetables and species
Classification of vegetables, types of vegetables growing
Export and import of vegetables and spices.

Unit II

Advanced production technology including seed production of important crops – cole crops, bulbous crops, solanaceous crops and root crops.

Unit III

Advanced production technology including seed production of – Leguminous vegetables, okra, leafy vegetables, potato, and sweet potato.

Unit IV

Production technology of- Coriander, fenugreek, black pepper, cardamom, ginger and turmeric and minor vegetables.

Unit V

Recent advanced in vegetables improvement . hydroponics Drip and sprinkler irrigation. Post-harvest technology of vegetables. Use of plastics including polyhouses, greenhouses and other structures. Role of plant regulators in vegetable and spice growing.

Practical

Raising of seedlings.
Growing of important vegetables in the field including their harvesting and marketing.
Use of plant regulators for seed treatment, fruit set and parthenocarpy.
Preparation and use of chemicals for control pests and diseases.
Raising of seeds of important vegetable crops.
Testing of vegetable seeds.
Canning, dehydration and pickling of vegetables.
Preparation of tomato ketchup and sauce.
Selection and display of vegetables for exhibition and their judging.
Cropping schemes for vegetable farms.
Economic studies in the production and disposal of principal vegetable crops.
Planning of research trials on important problems of vegetable growing.
Visit of vegetable markets, cold storages and research stations.
Maintenance of practical record.

Paper II- Floriculture and Ornamental Gardening

(100 marks)

Unit I

Importance, area , production, export and import of flowers, aromatic and medicinal plants, Response of flowers to environmental changes including flower forcing. Polyhouse and green house management.

Unit II

Classification and production technology of: (a) Annuals (b) Bi-ennials (c) Succulents and cactus (d) Moisture and shade loving plants (e) Ferns Palms and bulbous plants.

Unit III

Classification, cultivation and improvement of : Rose, Chrysanthemum, Canna, Dahlia, Gladiolus, Tuberose, Bougainvillea, Marigold.

Unit IV

Elements of landscape gardening styles of gardening. Moghul, Japanese and English gardens. Rock gardens and water gardens. Bonsai culture, Planning and arrangement of parks, building compounds and road-sides. Indoor gardening and flower arrangement.

Unit V

Aromatic and medicinal plant production:

- (A) Aromatic crops- Jasmines, mentha, lemon grass, citronella, palmarosa.
- (B) Medicinal crops- Dioscorea, Catharanthus, Digitalis, Vetiver, Cinchona.

Practical

1. Layouts of landscape gardens of building compounds, public grounds and public parks.
2. Cultivation of annuals in the beds and pots.
3. Layout plans of herbaceous and shrubby borders.
4. Practice in important cultural operations in outdoor and indoor plants.
5. Maintenance of greenhouses.
6. Intimate knowledge about important flowering trees, road-side plants, hedges, edges, shrubs, climbers, annuals, succulents moisture and shade-loving plants etc.
7. Growing, staging and judging of flower exhibits.
8. Preparation and presentation of herbarium.
9. Visit of important ornamental gardens.
10. Maintenance of practical record.

Paper III-AGRICULTURAL STATISTICS

(50Marks)

(A) Common course

(30 Marks)

Unit I

Classification and tabulation of data diagrammatic and graphical representation of data. Various measures of central tendency and dispersion, concept of standard error, test of significance based on z, t and f test.

Unit II

χ^2 test for testing the significance of goodness of fit and independence of attributes and its various uses in finding the heterogeneity and linkage in genetics and quantity of several variances.

Analysis of variance, Principles of experiments of designs, planning and analysis of simple experiments, completely randomised design, randomised block design and latin square design. Missing plot technique in randomised blocks and latin square designs (one plot missing), concept of probability.

Unit III

Linear regression and correlation, rank correlation, partial correlation and regression (upto 3 variables only)

Basis ideas in sampling, probability sampling, purposive sampling. Statistics of area and yield of crops. Sample surveys and crop cutting experiments.

(B) Specific course

(20 Marks)

Unit IV

Factorial experiment, Randomised block split plot and strip plot designs. Concept of confounding total and partial designs.

Unit V

Analysis of co-variance progeny row trials and compact family block design.

Paper IV-Fruit Science

(100 marks)

Unit I

Advances in nursery management and plant propagation. Apomixis and polyembryony, Stionic incompatibility, Role of chemicals in seed germination, rood induction and seedling growth. Advances in micro-propagation.

Unit II

Bio-chemical changes associated in fruit development, ripening and storage. Role of auxins, gibberellins, cytokinins, ethylene, morphactin, and growth retardants, in fruit production Parthenocarpy. Sexual incompatibility and pollination.

Unit III

Principles, problems, and prospects of fruit breeding. Methods of improvement e.g. introduction, clonal selection, hybridization, mutation breeding, polyploidy and heterosis. Advances made due to breeding in important fruit crops like mango, citrus, banana, grapes, apple and aonla.

Unit IV

Underlying principles of:

- (a) Irrigation of orchards: Time, amount and methods. Water requirement, Abnormalities caused by excess and deficiency of moisture.
- (b) Manurial requirements of fruit trees: Major and minor nutrients Nutrient deficiency and their remedy. Time, amount and methods of application of manures and fertilizers.
- (c) Training and Pruning of fruit trees: Definitions, objects, principles, season, systems, growth and bearing habits, severity of pruning.

Unit V

Major problems of fruit crops, their causes and remedies:

- (i) Irregular bearing
- (ii) Malformation or bunchy top
- (iii) Fruit drop
- (iv) Fruit cracking
- (v) Wilt, spongy tissue, granulation
- (vi) Citrus decline

Practical:

1. Intimate practical knowledge of commercial methods of propagation of plants.
2. Anatomy of rootage and graftage.
3. Study of polyembryony in seeds.
4. Use of plant regulators in propagation
5. Economics of raising plants by seeds and commercial asexual methods.
6. Planning and arrangements for manuring, irrigation, pruning, control of pests etc. In the orchards.
7. Economic studies in the management of orchards, gross income and net profit.
8. Visit to some commercial nurseries and orchards.
9. Maintenance of practical record.

Paper V- Production of fruits and Plantation Crops

(100 marks)

Unit I

Importance, area, production and productivity of fruit and plantation crops. Classification of fruit and plantation crops. Export and import of fruits and product of plantation crops.

Unit II

Modern production technology of mango, citrus, banana and grapes.

Unit III

Modern production technology of Guava, papaya, litchi, loquat, aonla, jackfruit, pomegranate, pine apple and ber.

Unit IV

Modern production technology of apple, pear, peach, plum and stone fruits.

Unit V

Production technology of :

- (A) Coconut, arecanut, oil palm, cashew, cocoa, tea, and coffee.
- (B) Brief study of growing minor fruits.

Practical:

1. Study of pollination problems in important fruit tree including modes of pollination, pollen viability, stigma receptivity, anthesis etc.
2. Study of morphology of important fruits.
3. Selection and display of fruits for exhibition and their judging.
4. Determination of leaf area by planimeter, N,P and K in plants and soil , crude fibre and carbohydrates in fruits.
5. Determination of reducing and non-reducing sugars, acids, vitamin C and protein in fruits.
6. Practice in preparation of jelly, marmalade, jam and squash and canning of fruits.
7. Application of hormones.
8. Planning of trials on important problems of fruit growing.
9. Visit to some important orchard, fruit markets and fruits research stations.
10. Maintenance of practical records.

Either Paper -VI Fruit technology

(100 marks)

Unit I

History, present position and future scope of fruit and vegetable preservation industry in India. General principles of fruit and vegetable preservation. Micro-biology of preserved foods.

Unit II

Canning and bottling of fruits and vegetables: Brief history of scientific canning, equipments of home canning and commercial production; important consideration for laying out a cannery. Canning of important fruits and vegetables. Spoilage of canned fruits and vegetables. Types , causes and remedial measures.

Unit III

Fruit and Vegetables juices: Unfermented beverages (sweetened and unsweetened), Principles of preservation. Home and commercial equipment for juices. Preparation and preservation of juice, squash and cordials from citrus fruits, mango, phalsa, gape, pomegranate, tomato etc. Fruit juice concentrates and their general method of preparation.

Unit IV

Jams, jellies and marmalades. Role of pectin, sugar and acid in jelly formation, general methods of preparation of jams, jellies and marmalades. Use of jelmeter equipments of home and commercial production.

Unit V

Pickle, sauce, chutneys and vinegar. General principles, quipment and methods of preparation. Preparation of pickles, sauces and chutneys from important fruits and vegetables. Butter, preserves and candied fruits. General principles and methods of preparation. Products

from fruits and vegetables wastes in home and commercial production. Sun drying and dehydration of fruits and vegetables. Equipments and methods.

Practical:

1. Canning of different fruits and vegetables.
2. Preparation of jams, jellies and marmalade.
3. Preparation of aonla and apple murabba.
4. Preparation of lime, lemon and orange squash, and lime juice cordial.
5. Vinegar making.
6. Tomato sauce and ketchup making.
7. Preparation of pickles.
8. Dehydration of some vegetables and fruits.
9. Maintenance of practical record.

OR

Thesis