

**SCHEME OF EXAMINATION  
B.A. AGROSERVICES (VOCATIONAL COURSE)**

**Semester-I**

<b>Paper-1</b>	General Concepts of Agroservices	3 hrs.	40+10*
<b>Paper-2</b>	Fertilizers and Organic Manures	3 hrs.	40+10

**Semester-II**

<b>Paper-1</b>	Speed Production Technology	3 hrs.	40+10
<b>Paper-2</b>	Post Harvest Handling of Seeds	3 hrs.	40+10
	Practical-Annually(Semester I & II)	6 hrs.	80+20

(Two session)

**Semester-III**

<b>Paper-1</b>	Irrigation Management	3 hrs.	40+10
<b>Paper-2</b>	Soil Management	3 hrs.	40+10

**Semester-IV**

<b>Paper-1</b>	Diagnosis of Crop Health Problems	3 hrs.	40+10
<b>Paper-2</b>	Agriculture Pest Management	3 hrs.	40+10
	Practical-Annually(Semester-III & IV)	6 hrs.	80+20

(Two session)

**Semester-V**

<b>Paper-1</b>	Agricultural Machines	3 hrs.	40+10
<b>Paper-2</b>	Modern Farm Management	3 hrs.	40+10

**Semester-VI**

<b>Paper-1</b>	Agro-Processing Projects & Credit Planning	3 hrs.	40+10
<b>Paper-2</b>	Feed Processing and Preservation	3 hrs.	40+10
	Practical-Annually (Semester V & VI)	6 hrs.	80+20

(Two Session)

<b>Total</b>	<b>900</b>
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\* 20% Internal assessment

## **SEMESTER-I**

**Time – 3 hrs.  
Marks- 40+10**

### **Paper- I GENERAL CONCEPTS OF AGROSERVICES**

- Note:** \* **Attempt five questions in all, selecting two questions from each Unit. Question No.1 is compulsory (short answer type).**
- **Nine questions are to be set spread over the entire syllabus. All questions carry equal marks.**

#### **Unit-I**

1. Scope and importance of Agroservices in India.
2. Land and Water resources for agriculture.
3. Soil-definition, soil formation, soil composition, physical and biological properties of soil.
4. Soil, classification and use pattern- a brief account, major soil types of India.

#### **Unit-II**

5. Rapid tests for analysis of soil and water samples. Study of soil maps.
6. Concept of soil productivity and fertility.
7. Sources of water for agriculture, water harvest techniques, utilization of water for irrigation.

## SEMESTER –I

### Paper-II FERTILIZERS AND ORGANIC MANURES

Time – 3 hrs.

Marks- 40+10

**Note:** \* Attempt five questions in all, selecting two questions from each Unit. Question No.1 is compulsory (short answer type).

- Nine questions are to be set spread over the entire syllabus. All questions carry equal marks.

#### Unit-I

1. Macro and Micro-elements essential for plant growth.
2. Fertilizers, definition, importance and types (simple, complex and mixed fertilizers).
3. Available forms of nitrogen, phosphorous and potassium in soil, types of N.P. and K. fertilizers used for increasing production of crops and fruit in the orchards.
4. Fertilizer application techniques in the field.
- 5.

#### Unit-II

6. Importance of soil organic matter on soil humans. Organic manners and their method of application.
7. Preparation of organic manners- composting rapid composition, phosphor compost, vermi compost.
8. Green-manuring and biofertilisers- a general account.

#### List of Books

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|-----|---|--|
| 1.  | ICAR  | Handbook of Manures and Fertilizers                                  |
| 2.  | Tarnhune,R.V.Motiamani,D.P.<br>Bali,Y.P. and Donahue,R.L. | Soils:Their Chemistry and Fertility in<br>Tropical Asia.             |
| 3.  | Miller, R.W. and Donahue,R.L.                             | Soils-An introduction to soils and<br>Plant Growth                   |
| 4.  | Das, P.K.   | Introduction to Soil Science   |
| 5.  | Brady, N.C.   | The nature and properties of soil                                    |
| 6.  | Mukherjee,S.K. and Biswas,T.D.                            | An introduction to soil science                                      |
| 7.  | Mostara,M.R. Bhattacharya,P.<br>And Srivastava, D.        | Biofertilizers Technology, Marketing<br>and usage                    |
| 8.  | ICAR  | Handbook of Manures and Fertilizers                                  |
| 9.  | Subha Rao, N.S.   | Biofertilisers in Agriculture and<br>Forestry                        |
| 10. | Tandon, H.L.S.(ed.)                                       | Fertilizers Organic Manures,<br>Recyclable Wastes and biofertilizers |
| 11. | Tilak, K.V.B.R.   | Bacteria Fertilizers   |
| 12. | Gaur, A.C.  | Organic Manures  |

## SEMESTER-II

**Time- 3 hrs.**

**Marks- 40+10**

**Paper-I**

### **SEED PRODUCTION TECHNOLOGY**

**Note: \* Attempt five questions in all, selecting two questions from each Unit. Question No.1 is compulsory (short answer type).**

- **Nine questions are to be set spread over the entire syllabus. All questions carry equal marks.**

#### **Unit-I**

1. Introduction of seed industry in India.
2. Seed Morphology and qualities of improved seeds.
3. Basic Principles relating to seed production.
4. Maintenance of purity in seed a standard variety.

#### **Unit-II**

5. Production techniques of some important crops of the zone.
6. Principles of the seed crop production.
7. Control measures for disease and pests of some important crops.

- Note: \* Attempt five questions in all, selecting two questions from each Unit. Question No.1 is compulsory (short answer type).**
- **Nine questions are to be set spread over the entire syllabus. All questions carry equal marks.**

**Unit-I**

1. Viability of seeds and factors affecting it.
2. Post-harvest handling of seeds cleaning, grinding, drying, treatment and storage.
3. Seed Packaging and packaging materials.
4. Seed storage technique.

**Unit-II**

5. Seed Marketing and Seed Certificate.
6. Economics of seed production.
7. Seed testing, Certification and seed act.
8. Hybrid cultivars and transgenic varieties – a general account.

**List of Books**

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|---|--|
| 1. L.R. Hawthorn and L.H.Pollard          | Vegetables and Flower Seed Production  |
| 2. J.R. Thomson                           | An Introduction to Seed technology   |
| 3. J.D. Bewley & M. Black                 | Physiology and Biochemistry of seeds   |
| 4. R.A.T. George                          | Vegetable seed technology: A technical Guide of vegetables and seed production Processing Storage and quality control. |
| 5. D.K. Salunkhe, B.B. Desai              | Post harvest Biotechnology of Oilseeds.  |
| 6. J.F. Harrington & J.e. Douglas         | Seed Storage and Packaging: Application For India  |
| 7. R.L. Agarwal                           | Seed Technology  |
| 8. V.K.Agarwal & Y.L.Agarwal              | Seed borne diseases of Field Crops and Their control   |
| 9. E.H. Roberts                           | Viability of seeds   |
| 10. P.K.Agarwal & M. Dadlani              | Techniques in seed science and technology  |
| 11. N.S. Tunwar & V.P.Singh               | Indian Minimum seed certification standard   |
| 12. D.K. Sahunkhe, B.B. Desai & N.R. Bhat | Vegetable & Flower seed production   |
| 13. J.P. Srivastava & L.T. Simarski       | Seed Production Technology   |
| 14. J.F. Harrington                       | Seed Storage and Longevity.  |

## SEMESTER-III

Time – 3 hrs.  
Marks- 40+10

### Paper- I Irrigation Management

**Note:** Attempt *five* questions in all, selecting two questions from each Unit. Question No.1 is compulsory (short answer type).

- Nine questions are to be set spread over the entire syllabus. All questions carry equal marks.

#### Unit-I

1. Irrigation management- terminology, concept and importance towards Crop production.
2. Water resources-surface and ground water resources. Factors affecting Water resources-climatic factors.
3. Quality of irrigation water, management of poor quality irrigation water. Conductive use of poor and good quality water and influence of poor quality water on soil properties.

#### Unit-II

1. Methods of application of irrigation water and irrigation channels, surface and sub-surface irrigation method, Sprinkler and drip irrigation methods
2. Concept of irrigation scheduling  
Time of irrigation based on phonological stages and soil moisture status of the crop. Amount of water to be irrigated . Irrigation schedules for different important crops.
3. Interaction of irrigation with other management practices.

## SEMESTER-III

**Time – 3 hrs.**  
**Marks- 40+10**

### **Paper- II Soil Management**

**Note: Attempt five questions in all, selecting two questions from each Unit.**

**Question No.1 is compulsory (short answer type).**

- **Nine questions are to be set spread over the entire syllabus. All questions carry equal marks.**

#### **Unit-I**

1. Concept of total and available nutrients
2. Soil testing and sampling

#### **Unit –II**

1. Visual diagnosis of deficiency symptoms in plants
2. Management practices for nutrient elements, nutrients toxicity especially minor nutrients elements

#### **List of Books**

1. Irrigation Management in Crops: Suraj Bhan
2. Irrigation Theory and Practice: A.M. Michael
3. Water Quality for agriculture: R.S. Ayers and D.W. Westcat
4. Diagnostic criteria for plants and soils: Chapman, Homer D.
5. Methods of Soil analysis: Block, C.A.
6. Soil fertility and fertilizers: Amar Singh

## **SEMESTER-IV**

**Time – 3 hrs.  
Marks- 40+10**

### **Paper- I    Diagnosis of Crop Health Problems**

**Note: Attempt five questions in all, selecting two questions from each Unit.  
Question No.1 is compulsory (short answer type).**

- **Nine questions are to be set spread over the entire syllabus. All questions carry equal marks.**

#### **Unit-I**

1. Diagnosis of health problems of cereals-Rice, Wheat and Maize- their insect pests and diseases and their control measures.
2. Diagnosis of health problems of Sugarcane-important pests and diseases
3. Diagnosis of health problems of pulses-Bean, Gram, Arhar, Pea – their important insect pests and diseases and control measures

#### **Unit-II**

1. Diagnosis of health problems of oilseeds- Mustard and Groundnut and control measures.
2. Diagnosis of health problems of important vegetables and fruits and their control.



## SEMESTER-IV

**Time – 3 hrs.**  
**Marks- 40+10**

### **Paper- II Agriculture Pest Management**

**Note: Attempt five questions in all, selecting two questions from each Unit.**

**Question No.1 is compulsory (short answer type).**

- **Nine questions are to be set spread over the entire syllabus. All questions carry equal marks.**

#### **Unit-I**

1. General grouping of Pesticides
2. Preparation, use and application of home-made pesticides
3. Seed treatment and soil treatment with pesticides

#### **Unit-II**

1. Fumigation – different fumigants and their application techniques.
2. Rat, termites and bird control

#### **List of Books:**

1. Plant Protection: Principles and Practices: S.B. Chattopadhyay.
2. Principles & Practices of Kharif Crops: CCSHAU, Hisar
3. Principles and Practices of Rabi Crops: CCSHAU, Hisar
4. Plant Diseases- R.S. Singh
5. Agriculture Pests of South Asia and their Management: A.S. Atwal and G.S. Dhaliwal.

## **PRACTICALS**

(Annually)

Based on Semester (III & IV)

Max. Marks 80+20

Time: 6 Hrs. (two sessions)

1. Methods for testing quality of irrigation water in Lab.
2. Visual diagnosis of deficiency symptoms in plants.
3. Visit to irrigation command area/meteorological observatory.
4. Field visit in both summer, monsoon and winter season to nearby farmer's field and of one crop covered in theory and identification and listing of insect damage, diseases and insect pests.
5. Collection of specimens, herbarium making.
6. Safety precaution measures before, during and application of pesticides.
7. Seed treatment-dry and wet.
8. Fumigation- infield, warehouse and grain stocks.
9. Rat control and termite control

## **SEMESTER-V**

**Time – 3 hrs.  
Marks- 40+10**

### **Paper- I    Agricultural Machines**

**Note: Attempt five questions in all, selecting two questions from each Unit.  
Question No.1 is compulsory (short answer type).**

- **Nine questions are to be set spread over the entire syllabus. All questions carry equal marks.**

#### **Unit-I**

1. Principles and working of indigenous ploughs and improved plough-mould board plough and disc ploughs.
2. Working of Harrows-spike tooth harrows.

#### **Unit-II**

1. Working of seed-cum-fertilizer drill, planter, rice transplanter, sugarcane transplanter, chaff cutter, indigenous and improved harvesting equipments.
2. Manual and power-operated sprayer and dusters.
3. Repair and maintenance of above implements.

## SEMESTER-V

**Time – 3 hrs.**  
**Marks- 40+10**

### **Paper- II Modern farm Management**

**Note: Attempt five questions in all, selecting two questions from each Unit. Question No.1 is compulsory (short answer type).**

- **Nine questions are to be set spread over the entire syllabus. All questions carry equal marks.**

#### **Unit-I**

1. Management objectives-Functions of management. Difference between farm and business management.
2. Management of human resources-motivating personnel and controlling.
3. Production management – product planning, budgeting as a tool decision making.

#### **Unit-II**

1. Financial management- the accounting system, measures of profitability, financial planning-the cash flow budget capital funds management
2. Marketing management- the marketing programme , the marketing target. Market planning-the place strategy pricing of products, sales, promotion, marketing organization.
3. Importance of information system, sources-national and international, public and private sources.

#### **List of Books:**

1. Farm Machinery & Equipment: Smith
2. Farm Machines & Equipment: O.P. Nakra
3. Modern Farm Management- Kartar Singh
4. Indian Economy-Ruddar Dutt & M. Sundharam
5. Principles of Agricultural Engineering Vol. 1. : A.M. Michael & T.P. Ojha

## SEMESTER-VI

Time – 3 hrs.

Marks- 40+10

### **Paper- I Agro-processing Projects and Credit Planning**

**Note: Attempt five questions in all, selecting two questions from each Unit.**

**Question No.1 is compulsory (short answer type).**

- **Nine questions are to be set spread over the entire syllabus. All questions carry equal marks.**

#### **Unit-I**

1. Procedures for preparation of projects, sources, terms and conditions of loans for financing agro-service and agro-processing projects.
2. Importance of credit: Classification of credit, sources, purpose for which credit is advanced by the financial institutions, source-wise and purpose-wise rates of interest charged, repayment schedule, credit planning for different forms of business organization

#### **Unit-II**

1. Assessment of pest harvest losses of food grains.
2. Grain storage principles and practices. Food grain storage structures-rural storage structures, bag and bulk storage
3. Unit operations in food processing; cleaning, drying-gain drying principles and different types of dryers, milling-commercial milling of paddy, wheat and pulses.

## SEMESTER-VI

Time – 3 hrs.  
Marks- 40+10

### Paper- II Food Processing and Preservation

**Note: Attempt five questions in all, selecting two questions from each Unit. Question No.1 is compulsory (short answer type).**

- **Nine questions are to be set spread over the entire syllabus. All questions carry equal marks.**

#### Unit-I

1. Importance and scope of food preservation industry, food preservation principles, preservation of fruits and vegetables and processed foods-by pasteurization, sterilization and blanching, by drying and dehydration, canning of fruits and vegetables.
2. Principles of preparation of juices and squashes. Preservation with sugar- preparation of jam and jelly.
3. Preservation with salt-preparation of pickles, chutneys and sauces.

#### Unit-II

1. Spoilage in processed foods- canned foods, pickles and jams.
2. Storage and marketing of preserved products. Different types of storage of fresh fruit and vegetables. Knowledge of short-term storage and cold storage and its applications in food preservation.

#### List of Books:

1. Handling and Storage of Food Grains: S.V. Pingale
2. Post Harvest Technology for Cereals, pulses and oilseeds.
3. Home-Scale processing 7 Preservation of Fruit and Vegetables-CFIRI, Mysore.
4. Manual of Fruit and vegetables Preservation: B.S. Chundwat & R.N. Sharma.
5. A Manual of Food Preservation at Home: C.M. Bhatt & R.N. Sharma.
6. Fruits and Vegetables: R.N. Sharma.

**PRACTICALS**  
(Annually)  
Based on Semester (V & VI)

Max. Marks 80+20  
Time: 6 Hrs. (two sessions)

1. Study of different indigenous and improved ploughs-mould board and disc ploughs with its operation
2. Study of harrows, cultivators, seed drills, planters, transplanters and threshers with its operation.
3. Preparation of some selected agro-service and agro-processing projects according to local potentiality.
4. Frequent visits to the Banks and other financial institutions for collection of information regarding credit for financing the potential agro-service and agro-processing projects.
5. Determination of moisture content and milling qualities of food grains.
6. Visit to different storage structures and commercial milling plants.
7. Preparation of squashes, RHS and syrups.
8. Preparation of jam and jelly
9. Preparation of pickles, chutneys and sauces.
10. Visit of food processing industries.