PUNJABI UNIVERSITY, PATIALA

Schemes of Studies and Examination for the B. A. –I & B.Sc.-I (Agro Services)

2011, 2012, 2013 EXAMINATIONS

Paper. No.	Subject	Paper	Total Marks
	Semester-I		
I	General Concepts of Agro Services	Theory Practical	60 40
II	Seed Production and Technology	Theory Practical	60 40
	Semester-II		
III	Mineral Nutrients and Chemical Fertilizers	Theory Practical	60 40
IV	Manures and Biofertilizers	Theory Practical	60 40
	Total		400

PUNJABI UNIVERSITY PATIALA
Agro Services-B.A-I & B.Sc.-I
2011, 2012, 2013 Examinations
(Semester-I)

PAPER-I: GENERAL CONCEPTS OF AGRO SERVICES

Max. Marks : 60
Duration of the Paper: 3hrs

INSTRUCTIONS FOR PAPER SETTER

The question paper will consist of three sections A, B and C. Section A and B will have four questions from the respective sections of the syllabus and will carry 10 marks each. Section C will consist of 10 short answer type questions which will cover the entire syllabus uniformly and will carry 20 marks in all.

INSTRUCTIONS FOR CANDIDATES

Candidates are required to attempt two questions from each section A and B and the entire section C.

Section-A

1. What are agro services? Scope and importance of agro services in India. Socio economic aspect of agro services. Types of agro services required for the development.
2. Water resources for agriculture, water resources availability and utilization. Rain fall pattern and utilization of rain water.
3. Application of water irrigation system/ methods, unlined open channels, lined open channels, underground pipe system, irrigation scheduling.
4. Land resources: Availability and utilization.

Section-B

1. Soil: definition, composition and classification. Physical properties of soil, study of soil maps.
2. Fertility status of soil and soil productivity.
3. Soil mineralogy.
4. Soil water balance. Infiltration-retention of soil water, deep drainage.

PRACTICALS

Max. Marks: 40
Duration of the Paper: 3hrs

1. Measurement of rainfall.
2. Types of irrigation systems prevalent in India with particular reference to Punjab.
3. Types of water resources available in Punjab.
4. Types of soils and measurement of soil fertility.
5. Analysis of various minerals present in different types of soil.
6. Water holding capacity of different soils.

PAPER-II: SEED PRODUCTION AND TECHONOLGY

Max. Marks: 60
Duration of the Paper: 3hrs

INSTRUCTIONS FOR PAPER SETTER

The question paper will consist of three sections A, B and C. Section A and B will have four questions from the respective sections of the syllabus and will carry 10 marks each. Section C will consist of 10 short answer type questions which will cover the entire syllabus uniformly and will carry 20 marks in all.

INSTRUCTIONS FOR CANDIDATES

Candidates are required to attempt two questions from each section A and B and the entire section C.

Section-A

1. Seed morphology and development.
2. Qualities of improved seed. Basic principles relating to seed production.
3. Production techniques of some important crops like, wheat, rice, maize and gram.
4. Transgenic varieties and their implication in modern agriculture.

Section-B

5. Longevity of seeds and factors affecting post harvest, handling, cleaning, grading and drying.
6. Seed packaging and packaging materials. Stored seed production, seed marketing, seed testing, seed certification and Seed Act.
7. Hybridization: production techniques of hybrids of some important crops.
8. Control measures of diseases and pests of some crops like wheat, sunflower, rice, gram and cotton.

PRACTICALS

Max. Marks: 40
Duration of the Paper: 3hrs

1. Fertility analysis of some seeds.
2. Determination of seed viability by TTZ and actual germination tests.
3. Determination of seed moisture of different crops.
4. Individual plots for seed raising (sowing to storage of seeds) of some important crops of Punjab.

Suggested reading/books for Paper - I & II

1. *Irrigation*: *Theory and Practices.* A. M. Michael, Vikas Publications.
2. *Agriculture and Industry Survey*. 5th Edition, Vadamal Media, Coimbatore.
3. *Vegetable and Flower Seed: Production.* L.R. Hawthorn and L.H. Pollard.
4. *An Introduction to Seed Technology. A Technical Guide to Vegetable Seed Production, Processing, Storage and Quality Control*. R.A.T. George.
5. *Post Storage & Packaging: Application for India.* J.P. Marrington & J.I.E. Touglas.
6. *Seed Technology.* R.L. Aggrawal.

7. *Seed Borne Diseases of Field Crops and their Control.* M.V. K. Aggrawal & V.L. Nene.
8. *Viability of Seeds.* E.H.Roberts.
9. *Techniques in Seed Science and Technology*. P.K. Aggarwal & M. Dadlani.
10. *Indian Minimum Seed Certification Standards.* N.S.Tunwar and V.P.Singh.
11. *Vegetable and Flower Seed Production.* D.K. Salunkhe, B.B. Desai and N.P.Singh.
12. *Seed Production Technology.* J.P. Srivastava and L.T.Simrkshi.
13. *Seed Storage and Longevity.* J.P.Harrington.
14. *Principles of Vegetable Seed Production.* S. Mhinohara.
15. *Seeds: The Year Book of Agriculture*-USDA.

(Semester-II)

PAPER-III: MINERAL NUTRIENTS AND CHEMICAL FERTILIZERS

Max. Marks: 60
Duration of the Paper: 3hrs

INSTRUCTIONS FOR PAPER SETTER

The question paper will consist of three sections A, B and C. Section A and B will have four questions from the respective sections of the syllabus and will carry 10 marks each. Section C will consist of 10 short answer type questions which will cover the entire syllabus uniformly and will carry 20 marks in all.

INSTRUCTIONS FOR CANDIDATES

Candidates are required to attempt two questions from each section A and B and the entire section C.

Section-A

1. Macro- and Micro elements essential for plant growth and their role.
2. Potassium – forms, its effects on plants and soil.
3. Sulphur- types and its effects on soil.
4. Nitrogen – forms, its effects on plants.
5. Phosphorus – forms, its effects on plants.

Section-B

6. Chemical fertilizers: types and their utility and application to different crops.
7. Nitrogen fertilizers, forms and their effects on plants and reaction in soil.
8. Potassium and sulphur containing fertilizers.
9. Agronomic efficiency of different chemical fertilizers.
10. Complex fertilizers, rapid test for detection of adulteration of major fertilizers.
11.

PRACTICALS

Max. Marks: 40
Duration of the Paper: 3hrs

1. Soil analysis in relation to macro and micro elements.
2. Study of effect different chemical fertilizers on crop growth pattern and productivity.
3. Classification of chemical fertilizers.
4. Identification of different types of chemical fertilizers.

PAPER-IV: MANURES AND BIOFERTILIZERS

Max. Marks: 60
Duration of the Paper: 3hrs

INSTRUCTIONS FOR PAPER SETTER

The question paper will consist of three sections A, B and C. Section A and B will have four questions from the respective sections of the syllabus and will carry 10 marks each. Section C will consist of 10 short answer type questions which will cover the entire syllabus uniformly and will carry 20 marks in all.

INSTRUCTIONS FOR CANDIDATES

Candidates are required to attempt two questions from each section A and B and the entire section C.

Section-A

1. Manures: definition, profile of manure, importance contribution.
2. Preparation of farmyard manure, its importance.
3. Preparation of green manure, its features and importance.
4. Agronomic efficiency of different manures.

Section-A

5. Biofertilizers: definition, different sources, importance and contribution.
6. N_2 fixing biofertilizers: *Rhizobium*, *Azotobactor*, *Azospirillum* and Cyanobacteria.
7. Recycling of organic wastes, compositions, sources and methods of application.
8. Management of biofertilizers and techniques of biofertilizer applications.

PRACTICALS

Max. Marks: 40
Duration of the Paper: 3hrs

1. Preparation of various types of manures through composting-bacteria and other related types.
2. Testing of quality of different manures.
3. Maintenance of biofertilizers stains and their cultures.
4. Effect of manures on soil health and fertility.

Suggested reading/books for Paper - III & IV

1. *Introduction to Soil Science.* D.K. Das.
2. *The Nature and Properties of Soil.* H.C. Breay.
3. *Soil Conditions and Plant Growth.* E. Russell.
4. *An Introduction to Soil Science.* S.K.Mukherjee.
5. *Handbook of Manures and Fertilizers.* ICAR.
6. *Composting, Sanitory Disposal and Reclamation of Organic wastes.* H.D.Gotass.
7. *Biofertilizers in Agriculture and Forestry.* W. S. Subba Rao.
8. *Biofertilizer. L.L.Somani, S.C.Bhandari*, S.W. Saxena and K. K.Vyas.
9. *Fertilizers, Organic Manures, Recyclable Wastes and Biofertilizers.* H.L.S.Tandon.
10. *Phosphate Solubilities, Micro-organisms and Biofertilizers.* A.C.Gaur.
11. *Agricultural Microbiology.* N. Mukherjee and T.K.Ghosh.

12. *Bacterial Fertilizers.* V. B. R. Tilak.