

COUNCIL OF HIGHER SECONDARY EDUCATION, MANIPUR

AGRICULTURE THEORY CLASS XI

One Paper

Time: 3 Hours

70 Marks

Section	Units	No. of Periods	Marks	
			Unitwise	Total
I	Part A Agriculture and Crop Production			
	• Unit: I: Scope and Importance	10	5	30
	• Unit: II: Physical Environment	35	12	
• Unit: III: Agriculture Economics and Crop Production	40	13		
	Part B Genetics and Plant Breeding	30	15	15
	• Unit: IV Genetics and Plant Breeding			
II	Livestock Production			
	• Unit V: Scope and Importance	10	5	25
	• Unit VI: Care and Management	35	15	
• Unit VII: Bio-waste Management and Government Schemes	10	5		
Total		170	70	

SECTION - I

PART A - AGRICULTURE AND CROP PRODUCTION:

Total Periods -85

Unit I: Scope and Importance:

10 Periods

- Definition of Agriculture, its branches
- Scope in the national economy and employment

Unit II: Physical Environment:

35 Periods

1. Climate and Weather, elements of Weather: Rainfall, Temperature, Humidity, Wind, Sunshine, Climate Change and Global warming. Introduction to various meteorological equipments.
2. Soil, Soil texture and structure and its types, distribution and area.
3. Soil erosion and Soil conservation. Reclamation of problematic soils acidic and alkali.
4. Tillage definition and types. Concept of conservation and tillage.

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Unit III: Agriculture Economics and Crop Production

35 Periods

1. Agricultural Economics, Cooperative system in Agriculture, Crop insurance. Kisan Credit Cards. Marketing of Agricultural products (supply chain, retailing, wholesale), haats.
2. Package of practices in field crops like important varieties, seed rate, sowing time, intercultural operations, yield and marketing for Rice, Wheat, Maize, Mustard, Sunflower, Soyabean, Groundnut, Black gram, Red gram, Pea, Jute, Sugarcane, Sorghum, gram & broad bean.
3. Package of practices of fruits: Mango, Banana, Guava, Lime, Grape, Pomegranate. Vegetables: Potato, Tomato, Cauliflower, Cabbage, Spinach, Brinjal, Bottle gourd, Pumpkin, Cucumber. Flower-Rose, Gladiolus, Marigold
4. Types of seed-foundation and certified and methods of plant propagation – Layering and Cutting, and Tissue culture.
5. Important farm implements and their general maintenance.

PART B - GENETICS AND PLANT BREEDING

30 Periods

Unit IV: Genetics and Plant Breeding

1. Cell and its structure, cell division-Mitosis and Meiosis and their significance in plant growth and development.
2. Introduction to -DNA, RNA, and their differences.
3. Role of Genetics in Plant breeding, self and cross-pollinated crops, methods of breeding in field crops-introduction, Selection, Hybridization, Mutation.
4. Mendel's laws of Inheritance. Illustrative depiction of the Mendel's experiments, their importance in plant breeding.

SECTION - II: LIVESTOCK PRODUCTION

Total Periods: 55

Unit V: Scope and Importance

10 Periods

- (a) Importance of livestock in Agriculture, National Economy and Nutritional security
- (b) Important animal based food products and their role in our diet.
- (c) Important indigenous and exotic breeds of cattle, buffalo and poultry, and quantitative and qualitative production details of produces (milk, meat and eggs)
- (d) Concept of Anand pattern of cooperative system of milk procurement and pricing of milk. Marketing of milk in India.

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Unit VI: Care and Management

35 Periods

- (a) Animal body structure and functions.
- (b) Concept of grazing and stall feeding including poultry feeding.
- (c) Principles of feeding, feeding practices; Important fodder crops; Silage and Hay preparation; Balanced ratio-definition and ingredients.
- (d) Housing of dairy animals and poultry.
- (e) Management of calves, bullocks, pregnant and milch animals as well as chicks and layers.
- (f) Economics of rearing dairy cattle , poultry.
- (g) Systems of milking by hand and by machine. Important considerations in both these methods.
- (h) Concept of clean milk production processing, pasteurization and packaging and milk. Familiarisation with the value added products from milk.
- (i) Principles of disease management and vaccination.
- (j) Signs of sick animals, symptoms of common diseases in cattle and poultry-Rinderpest, Black quarter, Foot and Mouth, Mastitis, Haemorrhagic Septicaemia, Solmonellosis, bird flu, Fowl Pox and Ranikhet disease, their prevention and control.

Unit VII: Bio-Waste Management and Government Schemes

10 Periods

- (a) Utilization of animals wastes in Biogas plant.
- (b) Important government schemes for development of livestock dairy, poultry in India. Their important features and eligibility criteria.

COUNCIL OF HIGHER SECONDARY EDUCATION, MANIPUR

AGRICULTURE CLASS XI PRACTICAL

One Paper

Time: 3 hours

30 marks

Section	Units	No. of Periods	Marks
I	Part A-Agriculture and Crop Production	20	08
	Part B- Genetics, Plant Breeding and Microbiology	10	04
II	Livestock practical	20	08
	Reports of the visit		05
	Viva voce		05
	Total	50	30

SECTION - I

PART A - AGRICULTURE AND CROP PRODUCTION

1. Agriculture and Crop Production

- (a) Visit to a crop field. Identify different crops growing in the field and make a report.
- (b) Identification of farm implements used for different operations, draw a design of at least 5 implements and make a report.
- (c) Identification of seeds of different crops.
- (d) Seed germination test. (two cereals , two pulses, two vegetables, two flowers)
- (e) Calculation of cost of production of rice crop in one hectare of land area & prepare a report.
- (f) Visit to an orchard and identify different fruit crops and make a report.
- (g) Identification of important vegetable crops, prepare a report.
- (h) Identification of important flower crops.
- (i) Orchard layout, digging of pits and planting of sapling of any one fruit crop.
- (j) Land preparation and sowing of rice crop seed in the bed.
- (k) Preparation of cropping scheme.**

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SECTION – II

2. Livestock

- (a) Identification of body parts of dairy animals and Poultry.
- (b) Identification of common breeds of cows, buffaloes and poultry birds.
- (c) Handling and restraining of animals.
- (d) Testing of milk fat and SNF.
- (e) Visit to a local veterinary hospital and observe the condition of a sick animal and prepare a report.
- (f) Compute ration for an animal and poultry and prepare a report.
- (g) Visit to milk processing plant and on outlet a milk & milk products centre. Record the processing & sale of variety in milk based products.
- (h) Identification of feeds, fodder crops and grasses.
- (i) Visit to Biogas plant.

3. Report on the Visits

1. The student have to prepare a report of their visit to different organizations and submit to the subject teacher for the evaluation. The report must contain the student's original work and observations.
2. Prepare Herbarium of different crops and weed species. The leaves of the crops and weeds are pressed dried and mounted on the Herbarium sheet.

4. Viva Voce

Students can be asked questions based on:

- (i) Identification of objects
- (ii) Visit Report analysis.
- (iii) Experiences in their field visits, etc.

A range of 5 to 10 questions can be asked depending on the response of the student. Evaluation $5 \times 1 = 5$ Or should be based on number of questions answered. Evaluator should stick to the time and $\frac{1}{2} \times 10 = 5$ number of questions.

COUNCIL OF HIGHER SECONDARY EDUCATION, MANIPUR

DESIGN OF QUESTION PAPER

Subject : AGRICULTURE
Paper : Theory
Class : XI
Full Marks : 70
Time : 3 Hours

WEIGHTAGE TO OBJECTIVES :						
I.	Objectives			Marks	Percentage	
	Knowledge (K)			15	21	
	Understanding (U)			26	37	
	Application (A)			22	32	
	Skill (S)			7	10	
	Total :			70	100	
WEIGHTAGE TO FORM OF QUESTIONS :						
II.	Form of questions		No. of Questions	Time (in minutes)	Marks	Percentage
	Essay/Long Ans. (E/LA)		3	60	15	21
	Short Ans. (SA-I)		7	56	21	30
	Short Ans. (SA-II)		10	40	20	29
	Very Short Answer (VSA)		10	20	10	14
	MCQ		4	4	4	6
	Total :		34	180	70	100
WEIGHTAGE TO CONTENTS :						
III.	Unit / Content:			Marks	Percentage	
	A	Agriculture and Crop Production	i) Scope and Importance	5	7	
			ii) Physical Environment	12	17	
			iii) Agriculture Economics and Crop Production	13	18	
	B	Genetics and Plant Breeding	i) Genetics and Plant Breeding	15	22	
	C.	Livestock Production	i) Scope and Importance	5	7	
			ii) Care and Management	15	22	
			iii) Bio-Waste Management and Govt. Scheme	5	7	
	Total :			70	100	
	IV.	SCEHEME OF SECTIONS : A, B and C				
V.	SCHEME OF OPTIONS : only in Long Answer					
VI.	DIFFICULTY LEVEL : Difficulty : 20 % marks Average : 50 % marks Easy : 30 % marks					

Abbreviation: K(Knowledge), U(Understanding, A(Application, Skill(S), E(Essay type), SA(Short Answer type), VSA(Very Short Answer Type), MCQ(Multiple Choice Question)

COUNCIL OF HIGHER SECONDARY EDUCATION, MANIPUR

DESIGN OF QUESTION PAPER

Subject : **AGRICULTURE**
Paper : Practical
Class : XI
Full Marks : 30
Time : 3 Hours

Sl. No.	Forms of exercise	Nature of Exercise	Skill/Objective to be tested					Marks allotted	Estimate Time in Minute
			O.S	M.S	D.S	R.S	R.U		
1.	Short	Theory (Principle/ Working formula/ illustration diagrams	1		1		1	3	30
2.	Short	Setting of instruments and using it.	2	1			1	4	30
3.	Major Experiment	Experimental procedure, tabulation, etc.	2	1	2	2	2	9	60
4.	Short	Reading of measurement	2	1			1	4	30
5.	Short	Viva-voce	5					5	
6.	Seasonal Record	Practical Note Book					5	5	
7.	Seasonal Record	Record of one activity							
Total								30	180

O.S. = Observation Skill, M.S.=Manipulative Skill, D.S.= Drawing Skill, R.S.= Reporting Skill,
R.U.= Related Understanding.

No fixed time is allotted for viva-voce. It is to be conducted during the course of the experiment.

COUNCIL OF HIGHER SECONDARY EDUCATION, MANIPUR

AGRICULTURE

Theory
Class XII

One paper

Time :3 hours

70 marks

Section	Titles	No. of Periods	Marks	
			Unitwise	Total
I	Advanced Crop Production and Organic Farming			
	Unit I : Advance Crop Production	42	16	25
	Unit II: Organic Farming	24	09	
II	Post-Harvest Management, Food Processing and Value Addition			
	Unit III: Post-Harvest Management	15	07	27
	Unit IV: Food Processing and Value Addition	51	20	
III	Subsidiary Enterprises of Agriculture Unit			
	Unit V: Subsidiary Enterprises in Agriculture	38	18	18
Total		170	70	

SECTION - I

Total periods - 66

- Unit- I: Advanced Crop Production 42 Periods
Food production including horticultural crops and its importance in the economy and nutritional security.
- Soil fertility, productivity and concept of essential plant nutrients. Classification of essential plant nutrients.
- Roles and functions of essential plant nutrients, their important deficiency symptoms.
- Soil samplings and its processing. Introduction to soil pH and Organic Carbon.
- Introduction to manure, fertilizers, Bio-fertilizers, their methods of application. Concept of Integrated Nutrient Management (INM).
- Concept of soil moisture availability various irrigation methods. Concept of precision and pressure irrigation - Drip and sprinkler irrigation.
- Methods of insect pest and disease management - Chemical, Biological and Mechanical. Concept of Integrated Pest Management (IPM).

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Unit - II: Organic Farming

24 Periods

- Concept, history and importance of Organic farming.
- Present status and contribution in the Regional and National economy.
- Important food products grown organically. Important Government Schemes for the promotion of organic farming in our country. Kitchen gardening.

SECTION-II

Total periods -64

Unit III: Post Harvest Management

15 Periods

Post harvesting management of fruits, vegetables and flowers, cereals, pulses and oilseeds. Status of food processing in our country.

Important Government schemes for food sector.

Unit IV: Food Processing and Value Addition

51 Periods

- Principles and methods of food processing and preservation. Benefits of food processing.
- Important value added products from fruits, vegetables, cereals, pulses and oil seeds. Preparation of jam, jelly, ketchup, , pickles, juice.
- Packaging, quality standards and their marketing including export.
- Flowers and their harvesting: important processed flower products, packaging, storage and their marketing.
- Concept of safe food and important food regulations.

SECTION-III

Total Periods - 38

Unit V: Subsidiary Enterprises in Agriculture

- Important subsidiary enterprises based on Agriculture including Horticulture and their importance in the socio-economic status of an individual.
- Mushroom, their nutritional status and methods of production
- Beekeeping and its important usage and importance of Honey, Wax and Royal jelly.
- Landscaping, development and maintenance of lawns and avenue gardens.
- Preparation of Bio-pesticides (plant based), Organic manures (composts) and Vermicomposting.
- Setting up nurseries and marketing of plant sapling and important Govt. Schemes for the support of these enterprises.

COUNCIL OF HIGHER SECONDARY EDUCATION, MANIPUR

AGRICULTURE

CLASS XII
(PRACTICAL)

One Practical Paper

30 Marks Time: 3 Hours

Periods 50

Marks 30

Section	Titles	No. of Periods	Marks
I	Advanced Crop Production and Organic Farming	22	08
II	Post-Harvest Management, Food Processing and Value Addition	14	06
III	Subsidiary Enterprises in Agriculture	14	06
IV	Collection and Visit Report		05
V	Viva Voce		05
	Total	50	30

SECTION: I

Unit I: Advanced Crop Production and Organic Farming

22 Periods

- Soil sampling and determination of Soil pH.
- Determination of soil organic carbon content.
- Preparation of nursery and seed beds.
- Seed treatment with fungicides and Bio-fertilizers.
- (e) Identification of different types of chemical fertilizers, composts, bio-fertilizers.
- Calculation of fertilizer requirement of crops (for wheat, rice and maize) based on their nutrient needs.
- Preparation of FYM and Compost.
- Calibration & dusters for pest control.
- Determination of moisture content of crop seeds (wheat, rice, maize and mustard).
- To find out 100-grain weight of crop seeds (wheat, rice, maize and mustard).
- Visit to a crop field and compare healthy plant with a diseased and insect affected plant.
- Calculation of different types of Insecticides, Fungicides and Herbicides.

SECTION: II

Unit II: Post-Harvest Management , Food Processing and Value Addition

14 Periods

- Visit to Bakery Unit, Local Chakki.
- Preparation of Jam, Jelly, ketchup and Morabba
- Drying of fruits, vegetables and flowers.
- Preparation of pickles.
- Identification of fresh and aged vegetables and fruits.
- Visit to cold storage and record the storage of various fruits and vegetables.
- Harvesting and packaging of flowers.
- Preparation of flower arrangements such as garland and rangoli.
- Visit to a flower mandi and record the activities in the mandi.
- Visit to a local fruit market and record the activities in the market.

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SECTION: III

Unit III: Subsidiary Enterprises in Agriculture

14 Periods

- (a) Preparation of plant based bio-pesticides (neem)
- (b) Visit to Mushroom production unit.
- (c) Visit to nearby apiary and record the process of beekeeping.
- (d) Observe the characteristics of different bee products (honey and wax).
- (e) Visit to a vermicomposting unit.
- (f) Observe the characteristics of compost.

Notes:

- 1) The students have to prepare a report on the visits recording their observations on the subject.
- 2) In case of practical of fruit and vegetable preservation and methods of production of value added products from fruits and vegetables, the student will have to write the procedure adopted and the necessary precautions to be taken in the answer sheet provided.

SECTION – IV

Report on the Visits

The student have to prepare a report of their visit to different organizations and submit to Subject teacher for the evaluation. The report must contain the student's original work and observations.

SECTION – V

Viva Voce

Students can be asked questions based on:

- (i) Identification of objects.
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PRESCRIBED TEXT BOOKS FOR CLASSES XI AND XII:

1. Handbook of Animal Husbandry
Published by : Directorate of Information and Publications of Agriculture, Indian Council of Agricultural Research, Krishi Anusandhan Bhavan, Pusa, New Delhi – 110012.
2. A Text Book of Animal Husbandry by G.C. Banerjee
Published by Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi.
3. Hand Book of Agriculture – ICAR publication
or
Hand Book of Agriculture by S.C. Panda,
Published by : J.V. Publishing House, Jodhpur.
4. A text book of Plant Breeding by Purohit & Purohit,
Published by : J.V. Publishing House, Jodhpur.
5. A text book of Genetics by Purohit & Purohit,
Published by : J.V. Publishing House, Jodhpur.
6. A text book of Production Technology of fruits crops by Prasad & Raju,
Published by : J.V. Publishing House, Jodhpur.
7. A text book of Production Technology of Vegetables & Flowers by Prasad , Raju & Bhardwaj,
Published by : J.V. Publishing House, Jodhpur
8. A text book of Field Crops by Mukund Joshi,
Published by : PHI Learning Private Ltd., Delhi.

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	II.	Post Harvest Management, Food Processing and Value Addition	i) Post Harvest Management	7	10	
			ii) Food Processing and Value Addition	20	28	
	III.	Subsidiary Enterprises of Agriculture	iv) Subsidiary Enterprises in Agriculture	18	26	
Total :			70	100		
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V.	SCHEME OF OPTIONS : only in Long Answer.					
VI.	DIFFICULTY LEVEL :					
	Difficulty	:	20 % marks			
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3.	Major Experiment	Experimental procedure, tabulation, etc.	2	1	2	2	2	9	60
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5.	Short	Viva-voce	5					5	
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COUNCIL OF HIGHER SECONDARY EDUCATION, MANIPUR

MINIMUM BASIC INFRASTRUCTURE REQUIRED FOR OPENING AGRICULTURE SUBJECT.

1. Instructional farm for crop production Practical & growing crops - 0.5 ha.
2. Machinery/implements - 1 Tractor & 1 Power tiller & 1 water pump
3. Equipments/implements - Cultivator, Harrow with farm implements like spade, hand hoe, khurpi, grass cutter etc.
4. Lab. Facility for soil analysis.
5. 1 shed for rearing 250 layers, measuring 625 sq. ft.(approx.)
6. 1 shed for rearing 250 broiler, measuring 250 sq. ft. (approx.)
7. 1 shed for rearing 4-5 dairy cattle, measuring 150 sq. ft. (15ft x 10 ft.) (approx.)
8. 1 store , measuring approximately 225 sq. ft.(15ft. X 15 ft.)(approx.)
9. 1 chaff cutter.