**SEMESTER - I**

**SYLLABUS**

**Subject: Agriculture and Rural DevelopmentSemester: I**

**Course Title: Fundamentals of Agronomy Course Code:AGRO101**

**No.of Hours:30 Hrs. Credits: 2**

**Objectives:**

* To identify the various tillage implements.
* To explain about cultivation of rice crop.
* To identify the various herbicides available in India.

**Course Outcomes**

At the end of the course, students will be able to

**CO1:**Explain the history and development of agriculture in India.

**CO2**: Explain crop production techniques and crop growth in relation to the environment.

**CO3**: Outline the principles and practices of weed management.

**CO4**: Discuss the classification, nomenclature, mode of action and selectivity of herbicides.

**CO5**: Compare the traditional and technology-supported practices in agriculture.

**UNIT-I: (6Hrs.)**

1.Definition of agriculture – meaning and scope of agronomy

2.History and development of agriculture in ancient India – agriculture in civilization era

3.National and International Agricultural Research Institutes in India

4.Agro-climatic zones of India – soils, land use pattern, major sources of irrigation and ground water potential

5.Agro-climatic zones of Andhra Pradesh – soils, land use pattern, major sources of irrigation and ground water potential

6.Tillage and tilth – objectives of tillage – characteristics of ideal seed bed – effect of tillage on soil properties – pore space, texture, structure, bulk density and color of the soil

**UNIT-II: (6Hrs.)**

1.Types of tillage – preparatory tillage – factors affecting preparatory cultivation, after cultivation, puddling

2.Sowing – methods of sowing – time and depth of sowing for major agricultural crops – cereals, pulses and oilseeds

3. Crop stand establishment – factors affecting optimum stand establishment

4. Planting geometry – competition – types of competition, intra and inter plant competition – plant population – effect of plant population on growth and yield – optimum plant density and planting pattern

5. Soil fertility – soil fertility and soil productivity – fertility losses – maintenance of soil fertility – soil organic matter

6. Weed control – definition of weed – losses and uses of weeds – weed influence on crop production – methods of wed control

**UNIT-III: (6Hrs.)**

1. Irrigation management – importance of irrigation – objectives of irrigation – methods of irrigation – drainage and its advantages

2. Cropping systems – monocropping – definition and principles of crop rotation – mixed cropping – intercropping – relay cropping – multistoried cropping – sole cropping and sequence cropping

3. Harvest maturity symptoms and harvesting of major agricultural crops – rice, maize, groundnut, sugarcane and pulses – maturity indices, method of harvesting, threshing and winnowing – harvest index

4. Introduction - weed definition - harmful and beneficial effects of weeds

5. Classification of weeds – classification based on morphology – life cycle – habitat – origin – association – special features and soil pH with examples.

6. Propagation of weeds – sexual – asexual – vegetative reproduction – dispersal of weed seeds and fruits – dispersal agents – wind and water – animal – man – manures –farm implements and silage – dispersal of vegetative propagules

**UNIT-IV: (6Hrs.)**

1. Weed Biology – characteristic features of weeds – weed ecology – definition – persistence of weeds climatic – edaphic and biotic factors – crop weed association with some important crops like rice, maize, wheat, jowar, pulses, groundnut, sugarcane, cotton and tobacco.

2. Crop -weed competition - principles – factors - critical period of crop-weed competition - allelopathy.

3. Methods of weed management – preventive weed control measures – physical / mechanical, cultural,

4. Chemical and biological methods of weed control – bioherbicides - integrated weed management

5. Herbicides – definition - advantages and limitations of herbicide usage in India- classification of herbicides based on chemical nature - time and method of application

6. Classes of herbicides based on – selectivity – spectrum – translocation – residual nature – soil sterilants and fumigants – types of formulations.

7. Nomenclature of herbicides - commonly available herbicides in India – adjuvants -definition, their use in herbicides application. - surfactants - stabilizing agents - solvents - humificants - stickers - activators - compatibility agents - drift control agents etc.

**UNIT-V: (6Hrs.)**

1. Mode of action of herbicides – important biochemical modes of action of herbicides interfearing with photosynthetic reactions – respiration -enzymatic inhibition etc – effects of sub lethal doses of herbicides on plants

2. Selectivity of herbicides – fundamental principles of selectivity - differential rate of absorption - differences in morphology and growth habit of plants - rate of translocation.

3. Selectivity of herbicides - differential rate of deactivation of herbicides – metabolism - reverse metabolism – conjugation - protoplasmic resistance to the specific herbicide

4. Weed management in different crops and cropping systems – rice – nursery – upland rice – low land rice – wheat – sorghum – maize – red gram – blackgram – groundnut – sunflower.

5. Weed management in different crops and cropping systems – sugarcane – cotton - tobacco, Vegetables (tomato, onion, chilli and brinjal) and Orchards (mango, banana and citrus).

6. Our Journey in Agriculture and Vision for the Future

7. Traditional and Technically knowledge of agricultural crops

**References Text Books:**

1. Yellamanda Reddy, T. and SankaraReddy, G.H. 2010. Principles of Agronomy.Kalyani Publishers*,* Ludhiana*.*
2. Crafts, A.S. and Robbins, W.W. 1973. Weed Control. *Tata McGraw-Hill Publishing Co. Ltd*.,New Delhi.
3. Gupta, O.P. 1984. Scientific Weed Management. Today and Tomorrow Printers andPublishers, New Delhi.
4. Gupta, O.P. 2004. Modern Weed Management. Agro Bios (India), Jodhpur.

**MODEL QUESTION PAPER**

**Subject: Agriculture and Rural DevelopmentSemester: I**

**Course Title: Fundamentals of AgronomyCourse Code: AGRO101**

**Time: 3Hrs.Max. Marks: 100**

**SECTION-A**

**Answer ALLquestions:201= 20 M**

1.Father of tillage

1. Darwin
2. Newton
3. Fleming
4. Jethro TULL

2.The term agronomy is derived from

1. Latin
2. Greek
3. German
4. French

3.Directorate of wheat research is located at

1. Orissa
2. Delhi
3. Karnal
4. Kerala

4. M.O.P is

1. K2so4
2. K2so4.mgso4
3. Kno3
4. All of these

5.Weed which is used as green vegetable.

1. Amaranthusviridis
2. Panicumsps.
3. All of the above
4. both A&B

6.Drip irrigation is known as

1. Trickle irrigation
2. Line source of irrigation
3. both the above
4. none of these

7. Rabi season starts from

1. June-august.
2. oct-nov
3. April-May
4. July-Dec

8.Origin of chilli.

1. Mexico
2. Germany
3. Peru
4. Iran

9. I.C.A.R. is located at

1. Punjab
2. Chennai
3. Delhi
4. Goa

10) Weeds are controlled by how many methods.

1. 5
2. 4
3. 3
4. 2

11. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_zone consists of three distinct sub-zones of Jammu and Kashmir, Himachal Pradesh and Uttar Pradesh hills.

12.\_\_\_\_\_\_\_\_\_\_ is the physical condition of soil resulting from tillage

13.Which districts comes under Krishna godavari region\_\_\_\_\_\_\_\_\_\_\_.

14. \_\_\_\_\_\_\_\_\_\_ soil can be ploughed only within a narrow range of soil moisture and the power or draught required is high.

15.Examples of mixed cropping\_\_\_\_\_\_\_\_\_\_\_.

16. Scientific name of Ground nut \_\_\_\_\_\_\_\_\_\_\_\_.

17. Examples of contact herbicide\_\_\_\_\_\_\_\_\_\_\_.

18. Give an examples of weed which is used as leafy vegetable\_\_\_\_\_.

19. Expand 2, 4-D\_\_\_\_\_\_\_\_\_\_\_\_\_.

20. \_\_\_\_\_\_\_\_\_\_ Herbicide is used to control weeds in rice.

**SECTION-B**

**Answer any FOUR questions:48 = 32 M**

21.Define Agriculture, write scope &importance of agronomy in agriculture.

22. Define tillage explain the effect of tillage on soil properties.

23.Define weed&write advantages &disadvantage.

24.Write the climatic zones of Andhra Pradesh.

25.Define sowing& explain sowing methods in agriculture.

26.Define cropping system&explain various cropping systems.

**SECTION-C**

**Answer any FOUR questions:412 = 48 M**

27. Explain the various methods of weed management.

28. Define herbicides and write advantages, limitations of herbicides.

29. Define irrigation explain various methods of irrigation

30. Define drainage explain advantages and disadvantages of irrigation.

31. Describe the classification of herbicides.

32. Define competition describe various types of competition

**PRACTICAL SYLLABUS**

**Subject: Agriculture and Rural Development Semester: I**

**Course Title: Fundamentals of Agronomy-Practical**

**Course Code: AGRO101P**

**No.of Hours: 30 Hrs. Credits: 1**

**Objectives:**

* To identify the various tillage implements.
* To explain the cultivation of rice crop.
* To identify the various herbicides available in India.

**Course Outcomes:**

**CO1:** Students will understand to analyze the Crop production techniques and crop growth in relation to environment.

**CO2**: Students will understand to describe the Zero and minimum tillage: their basics and application.

**CO3**: Students will learn Precision agriculture and Precision farming, their concepts and application.

**EXPERIMENTS:**

1. Study of tillage Implements: Fields. **(3 Hrs.)**

2. Practice of puddling: Fields. **(3 Hrs.)**

3. Study of seeding equipment – different methods of sowing: Fields. **(3 Hrs.)**

4. Study of manures, fertilizers and green manure crops / seeds.**(4 Hrs.)**

5. Study of inter-cultivation implements and practice. **(4 Hrs.)**

6. Herbarium preparation of weeds. **(3 Hrs.)**

**7. Field tours: Water reservoir: (10 Hrs.)**

1. **Krishna**
2. **Pattiseema Project (Polavaram)**
3. **Godavari**

**Scheme of Evaluation:**

|  |  |  |
| --- | --- | --- |
| **S.No.** | **Experiment** | **Marks (50)** |
| 01 | Major Experiment | 15Marks |
| 02 | Minor Experiment | 10Marks |
| 03 | Viva | 10Marks |
| 04 | Record | 10Marks |
| 05 | Skills | 05Marks |

**SYLLABUS**

**Subject: Agriculture and Rural Development Semester: I**

**Course Title: Fundamentals of Plant Biochemistry and Soil ScienceCourse Code:BICM101**

**No.of Hours:30 Hrs. Credits: 2**

**Objectives:**

* To identify the building blocks of proteins and their assembly in macromolecules as well as interpret basic enzyme kinetic parameters.
* Toexplain about the conversion of light energy into chemical energy in photosynthesis.
* To identify Contrast the different mechanisms of carbon fixation in the plant kingdom.

**Course Outcomes**

At the end of the course, students will be able to

**CO1:** Explain scope and importance of biochemistry in agriculture and structural classification of biomolecules

**CO2**: Summarize the properties and mechanism of enzyme activity.

**CO3:**Outline the metabolism of biomolecules.

**CO4**: Classify rocks, minerals and soils and explain various aspects of soil.

**CO5:** Discuss the importance of nitrogen fixation, role of phosphorous and organic matter in enhancing soil fertility.

**UNIT-I: (6Hrs.)**

1. Introduction – Historical aspects of Biochemistry– Scope, impact, and importance of Biochemistry in agriculture.

2. Carbohydrates– Classification - Structures – Monosaccharides – Structural aspects.

3. Oligosaccharides and polysaccharides-Functions of carbohydrates

4. Lipids – Fatty acids – Structures and properties – Functions of lipids.

5. Lipids - Classification – Storage lipids and membrane lipids – Saponification, hydrogenation.

6 Amino acids – Structures - Classification – Zwitterions.

**UNIT-II: (6Hrs.)**

1. Peptides – Oligopeptides – Cyclic and acyclic peptides.

2.Proteins –Importance - Classification - Properties of proteins –Isoelectric pH– Denaturation.

3.Proteins – Structural organization – Primary, secondary, tertiary, and quaternary structures and forces involved in stabilizing proteins.

4. Enzymes – Characteristics of enzymes – Chemical nature, speed, specificity, active site - activation energy – Mechanism of enzyme action.

5. Measurement of enzyme activity – Factors effecting enzyme activity – Enzyme Inhibition.

6. Classification of enzymes.

**UNIT-III: (6Hrs.)**

1. Nucleic acids–Functions–Structures of nitrogen bases–Nucleosides–Nucleotides in RNA and DNA.

2. Various types of DNA and RNA – Secondary structure of B-DNA and t-RNA.

3.Metabolism–Anabolism and Catabolism–Stages of respiration–Overall metabolic view of carbohydrates, proteins, and lipids.

4. Metabolism of carbohydrates – Glycolysis – Aerobic and anaerobic.

5. Tricarboxylic Acid (TCA) cycle AND Electron transport chain (ETC.)

6. Metabolism of lipids –Biosynthesis of fatty acids and oxidation of fatty acids.

**UNIT-IV: (6Hrs.)**

1. Introduction – evolution of the earth – spheres of the earth atmosphere, hydrosphere and lithosphere – their characteristics – origin of soil – soil and soil components – mineral matter, organic matter, water and air – definition of soil and various concepts of soil – branches of soil science.

3. Rocks – classification of rocks based on mode of origin – igneous rocks, sedimentary rocks and metamorphic rocks – classification of rocks based on silica content – weatherability of rocks.

4. Minerals – primary, secondary, essential, and accessory minerals – primary minerals – quartz, feldspar, micas, pyroxenes, amphiboles, and olivine’s – weatherability of primary minerals.

5. Soil profile – detailed description of a theoretical soil profile – differences between surface soil and sub soil.

**UNIT-V: (6Hrs.)**

1. Nitrogen fixation, denitrification, solubilization of phosphorus and biological control of plant diseases – promotion of plant growth promoting substances – harmful activities of soil organisms.

2. Soil organic matter – various sources – composition – compounds in plant residues – their decomposability – humus – definition – synthesis of humus.

3. Importance of soil organic matter and humus – fractionation of soil humus – carbon cycle – carbon.

4. Important soil groups of India – alluvial soils, black soils, red soils, laterite soils and coastal sands.

**ReferenceText Books:**

1. Principles of Biochemistry-Lehninger
2. David L. Nelson, Michael M.Cox; W.H. Freeman.Lehninger Principles of Biochemistry, 6th Edition
3. Biochemistry, Dr.U.Satyanarayana, Dr.U. Chakrapani, Books and Allied(P) Ltd, Kolkata

**MODEL QUESTION PAPER**

**Subject: Agriculture and Rural Development Semester: I**

**Course Title:Fundamentals of Plant Biochemistry and Soil ScienceCourse**

**Code: BICM101 Time: 3Hrs. Max. Marks: 100**

**SECTION-A**

**Answer ALLquestions:201 = 20 M**

|  |
| --- |
| 1. The general chemical formula of Carbohydrates is   1. (CH2O)2n 2. (CH2O)22n 3. (CHO)n 4. CnH2n   2. Non protein amino acid present in coenzyme-A is   1. Beta alanine 2. D-Phenyl alanine 3. Hydroxyl proline 4. N-acetyl glutamic acid   3. Which of the following tricarboxylic cycle?   1. Acetic acid 2. Succinic acid 3. Oxaloacetic acid 4. Citric acid   4. Name the two essential fatty acids?   1. Linoleate and linolenate 2. Oleic and linoleic 3. Lauric and myristic 4. Arachidonic and oleic   5.Which of the following enzyme catalyzes the first step of Glycolysis?   1. Hexokinase 2. Pyruvate kinase 3. Glucokinase 4. Phosphofructokinase   6. The product of light reaction of photosynthesis are   1. Hexose and oxygen 2. Hexose and ATP 3. ATP and NADPH 4. Hexoses and NADPH   7. Most of the soil organism is   1. Psychrophiles 2. Mesophiles 3. Thermophiles 4. All of the above   8. Quantity of soil to be taken for texture analysis   1. 10g 2. 20g 3. 30g 4. 40g |
| 9. Identify the purine of nucleic acids in the following |
| 1. Cystine 2. Thymine 3. Uracil 4. Adenine   10. Which fertilizer produce acidity in soil   1. Ammonium sulfate 2. Sodium nitrate 3. Calcium ammonium nitrate 4. Calcium nitrate   11. Carbohydrates are \_\_\_\_\_\_\_\_\_\_or \_\_\_\_\_\_\_\_\_\_\_\_\_ derivatives of polyhydric alcohols.  12. The sequence of amino acids in a protein is called its \_\_\_\_\_\_\_\_\_\_.  13. Out of 200 different amino acids found in nature the number of amino acids present in protein\_\_\_\_\_\_\_\_\_\_\_\_\_\_.  14. The Sulphur containing amino acids\_\_\_\_\_\_\_\_\_\_\_.  15. Enzymes which are used in the cells which make them are said to be \_\_\_\_\_\_\_\_\_\_ enzymes.  16.Building blocks of nucleic acids are \_\_\_\_\_\_\_\_\_\_\_\_. 17. Most of the enzymes of TCA cycle in plant are cell located in \_\_\_\_\_\_\_\_\_.  18. In Eukaryote cell of plant ETC occurs in\_\_\_\_\_\_\_\_\_\_\_\_.  19.Animal waste decay by the action of bacteria which create \_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_ products rich in nitrogen, and useful for plants to use again.  20. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_bacteria in the soil can break down the ammonia into the gaseous form of nitrogen, which is not available for use by plants or animals. |

**SECTION-B**

**Answer any FOUR questions: 48 = 32 M**

21. Define Carbohydrates. Classification of carbohydrates in detail with structural examples in each class and function of carbohydrates.

22. Define enzymes. Describe the enzyme activity? What are the factors that affectenzyme activity?

23. Classify Basic Amino acids in details with structural examples in each class and properties of amino acids?

24. Classification of proteins basis of their functions, Chemical solubility and Structural.

25. Discuss about various organelles of plant cell with neat, labelled diagram.

26. Write about the influence of organic matter on soil physical and chemical properties?

**SECTION-C**

**Answer any FOUR questions:412 = 48 M**

27. Describe glycolysis and TCA pathway? Mention the enzymes and coenzymes involved in the Two Pathways.

28. Describe the mechanism ETC in plant cell.

29. Types of soil? Significance of soil colour and Explain about beneficial effects of soil organisms.

30. Give an account on Structure DNA? What are the types of RNA and functions?

31. With the help of a neat diagram, explain role of nucleic acids in protein biosynthesis.

32. Describe the mechanism of Nitrogen fixation.

**PRACTICAL SYLLABUS**

**Subject: Agriculture and Rural Development Semester: I**

**Course Title: Fundamentals of Plant Biochemistry and Soil Science-Practical**

**Course Code:BICM101P**

**No.of Hours:30 Hrs.** **Credits:1**

**Objectives:**

* To identify the building blocks of proteins and their assembly in macromolecules as well as interpret basic enzyme kinetic parameters.
* To Explain the conversion of light energy into chemical energy in photosynthesis
* To Contrast the different mechanisms of carbon fixation in the plant kingdom.

**Course Outcomes:**

**CO1:**Students willunderstand of Biochemistry as a discipline and milestone discoveries in life sciences that led to establishment of Biochemistry as separate discipline.

**CO2:**Students will understand theFundamental properties of elements, their role in formation of biomolecules and in chemical reactions within living organisms.

**CO3:**Students will understand plant cell structure, organization, and apply specific biochemical functions to compartments of the plant cell.

**CO4:**Students will learn amino acid structures and relate their chemical properties to the synthesis and function of proteins and enzymes.

**CO5:**Students willunderstand protein structural hierarchy and relate structure to function.

**EXPERIMENTS:**

Experiment No.1-Determination of pH and use of pH meter. **(5Hrs.)**

Experiment No.2-Preparation of molar, Normal solutions and Buffers.

**(5Hrs.)**

Experiment No.3-Estimation of carbohydrates (glucose) by DNS method. **(5Hrs.)**

Experiment No.4-Estimation of Proteins by Biuret method. **(5Hrs.)**

Experiment No.5-Study types of soil. **(5Hrs.)**

Experiment No.6-Study of sampling collection, processing and storage.

**(5Hrs.)**

**Scheme of Evaluation:**

|  |  |  |
| --- | --- | --- |
| **S.No.** | **Experiment** | **Marks (50)** |
| 01 | Major Experiment | 15Marks |
| 02 | Minor Experiment | 10Marks |
| 03 | Viva | 10Marks |
| 04 | Record | 10Marks |
| 05 | Skills | 05Marks |

**SYLLABUS**

**Subject: Agriculture and Rural Development Semester: I**

**Course Title: Fundamentals of AgricultureEconomics**

**Course Code: AECO141**

**No. of Hours:30 Hrs. Credits: 2**

**Objectives:**

* To analyse Agricultural Crop Price determination.
* To analysetheMarket Structures.
* To analysethe practices followed in Agriculture.

**Course Outcomes**

**CO1:**Apply concepts and terms of economics to the agricultural sector.

**CO2**: Explain characteristics of wealth, welfare, needs and surplus and laws of marginal utility.

**CO3**: Outline different aspects of demand and supply, essentials of market, pricing and competition.

**CO4**: Summarize the concepts of national income, classification and cannons of taxation, features of public and private finance, sources of public revenue.

**CO5**: Explain principles and meaning of public expenditure, concepts of inflation, types, causes and control of inflation.

**UNIT-I: (6 Hrs.)**

1. Economics – meaning – definitions – subject matter of economics – traditional approach
   1. consumption, production, exchange and distribution
2. Modern approach – microeconomics and macroeconomics – methods of economic
   1. investigation – deduction and induction
3. Agricultural economics – definitions – meaning – importance of agricultural economics – branches of agricultural economics
4. Agricultural production economics – meaning – definitions – subject matter – objectives; Farm management – meaning – scope – definitions – objectives
5. Agricultural finance – meaning – definitions – micro vs macro finance –need for agricultural finance; Agricultural marketing – meaning – definition – importance of agricultural marketing
6. Basic terms and concepts in economics – goods and services – free and economic goods,utility – cardinal and ordinal approaches – characteristics of utility – forms of utility

**UNIT-II: (6Hrs.)**

1. Value – definition – characteristics; price – meaning; wealth – meaning – attributes of wealth – types of wealth – distinction between wealth and welfare; Wants – meaning characteristics of human wants
2. Law of diminishing marginal utility – statement – assumptions of law – explanation – limitations of the law – importance
3. Law of equi-marginal utility – meaning – assumptions – explanation of the law – limitations of the law – practical importance
4. Consumer’s surplus – meaning – assumptions – explanation – difficulties in measuring consumer’s surplus – importance
5. Demand – meaning – definition – types of demand – income demand, price demand andcross demand
6. Demand schedule – demand curve – Law of demand – contraction and extension, increase and decrease in demand

**UNIT-III: (6 Hrs.)**

1. Elasticity of demand – meaning – elastic and inelastic demand – kinds of elasticity of demand – perfectly elastic, perfectly inelastic, relatively elastic, relatively inelastic and unitary elastic demand
2. Price elasticity – income elasticity and cross elasticity of demand – practical importance of elasticity of demand
3. Supply – meaning – definition – Law of supply – supply schedule – supply curve
4. Increase and decrease in supply – contraction and extension of supply – factors affecting supply

Elasticity of supply – kinds of elasticity of supply – perfectly elastic, perfectly inelastic, relatively elastic, relatively inelastic and unitary elastic – factors affecting elasticity of supply

1. Price determination – equilibrium price and quantity – determination of market price
2. Markets – definition – essentials of market – classification of market structure – perfect and imperfect markets

**UNIT-IV: (6 Hrs.)**

1. Characteristics of monopolistic competition – monopoly and oligopoly
2. National income – concepts of national income – gross domestic product, gross national product, net national product, net domestic product – national income at factor cost, personal income, disposable income
3. Methods of measurement of national income – product method, income method and expenditure method
4. Public finance – meaning – role and importance of public finance – functions of the government – differences between public finance and private finance
5. Public revenue – meaning – major and minor sources of public revenue
6. Tax – meaning – classification – direct and indirect taxes – methods of taxation – proportional, progressive, regressive and degressive taxation, agricultural taxation – other types of taxation – Value Added Tax (VAT)
7. Canons of taxation – Adam Smith‘s canons of taxation – equality, economy, certainty and convenience – other canons of taxation

**UNIT-V (6Hrs.)**

1. Public expenditure – meaning – need for public expenditure – social and economic overheads, balanced regional growth, development of agriculture and industry, exploitation and development of mineral resources and subsidies and grants to provinces, local governments, and exporters
2. Principles of public expenditure – Principle of maximum social benefits Principle of economy, *i.e.,* wasteful expenditure should be avoided, Principle of sanction, *i.e.,* authorized expenditure, Principle of balanced budget, Canon of elasticity, *i.e.,*fairly flexible and Avoidance of unhealthy effects on production and distribution
3. Inflation – meaning – definition – related concepts of inflation – *deflation, disinflation,* stagflation *and reflation* – measurement of inflation -consumer price index, wholesale price index, producer price index and GDP deflator
4. Types of inflation – demand pull and cost push inflation – comprehensive and sporadic inflation – suppressed and repressed inflation – creeping, walking, running and galloping inflation – mark up inflation
5. Causes of inflation – factors causing increase in demand – increase in money supply, increase in disposable income, increase in public expenditure, increase in consumer spending, cheap monetary policy, deficit financing and increase in exports, factors causing shortage of supply – shortage of factors of production, industrial disputes, natural calamities, artificial scarcities, increase in exports, lop-sided production, Law of diminishing returns and international factors
6. Remedial measures to control inflation – monetary measures – credit control, demonetization of currency and issue of new currency – fiscal measures – reduction in unnecessary expenditure, increase taxes, increase in savings, surplus budgets and public debt.

**References Text Books:**

1. Dewett, K.K. and Chand, A. 1979. *Modern Economic Theory*.

2. S. Chand and Co., New Delhi. Dewett, K.K. and Varma, J.D. 1986. *Elementary Economics.*

3. S. Chand and Co., New Delhi. Jhingan, M.L. 1990. *Advanced Economic Theory.*Vikas

Publishing House, New Delhi.

**MODEL QUESTION PAPER**

**Subject: Agriculture and Rural Development Semester: I**

**Course Title: Fundamentals of Agricultural Economics**

**Course Code: AECO141**

**Time: 3Hrs. Max. Marks: 100**

**SECTION-A**

**Answer ALL questions:201 = 20 M**

1. The destruction of utility or use of commodities and services to satisfy human wants is called
2. Consumption
3. Production
4. Exchange
5. Distribution
6. It refers to sharing of wealth that is produced among the different factors of production
7. Consumption
8. Production
9. Exchange
10. Distribution
11. Micro economics also called as
    1. Income theory
    2. Price theory
    3. Production theory
    4. Art of theory
12. Father of economics
13. Alfred marshal
14. Lionel Robbins
15. Adam smith
16. J. M. keins
17. It is defined as the science that deals with organization and operation of the farm in the context of efficiency and continuous protests is called
18. Production
19. Farm management
20. Cost of cultivation
21. Farm budgeting
22. \_\_\_\_\_\_\_\_\_\_\_\_ goods are those which can be used repeatedly during the production and consumption process over several times
23. Mono period
24. Poly period
25. Both A &B
26. None of the above
27. The excess of price which he would be willing to payrather than go without the thing over that which he actually does pay \_\_\_\_\_\_\_\_
28. Demand
29. Supply
30. Consumer surplus
31. Producer surplus
32. Demand curve has a negative slope i.e., it slopes downwards from \_\_\_\_\_\_\_\_\_\_
33. Left to right
34. Right to left
35. Straight line
36. Horizontal line
37. Supply curve is
38. Downward slope
39. Straight line
40. Horizontal line
41. Upward slope
42. Demand is the degree of responsiveness of quantity of demand of a good to a change in its price is called
43. Price elasticity
44. Income elasticity
45. Cross elasticity
46. Consumer surplus

11. There are two methods of economic investigation that are \_\_\_\_

12. Wealth definition given by\_\_\_\_\_\_

13. \_\_\_\_\_\_ expresses the relationship between supply and the factors.

14. \_\_\_\_\_\_\_\_\_is any place where the sellers of a particular good or service can meet with the buyers of that goods and service where there is a potential for a transaction to take place.

15. \_\_\_\_\_\_\_\_\_\_\_ it refers to the process by which total resource use is divided between private and social goods by which the mix of social goods is chosen, this is done by the budgetary policy.

16. \_\_\_\_\_\_\_\_\_\_ is exempt under the Indian Income Tax Act.

17. Adam Smith’s was a pioneer in the field of taxation and made notable contributions popularly known as \_\_\_\_\_\_\_\_\_\_\_\_\_

18. \_\_\_\_\_\_\_\_\_\_\_A slowing in the rate of price inflation.

19. GDP Deflator\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

20. \_\_\_\_\_\_\_\_\_and \_\_\_\_\_\_\_\_\_\_ is another measure of direct control to check inflation.

**SECTION-B**

**Answer any FOUR questions:48 = 32 M**

21.Define and Law of Diminishing marginal utility, explain with neat labeled graphs?

22. Define Demand? Write about demand with graph?

23.Write about consumer’s surplus with graph?

24.Explain about law of Equal marginal utility?

25.Define Macroeconomics and write the importance of micro and macroeconomics?

26. Write about goods classification?

**SECTION-C**

**Answer any FOUR questions: 412 = 48 M**

27. Define Agricultural economics? Write the Aims and objectives of Agricultural economics?

28. Explain about public finance and public revenue?

29. Define supply? Explain about the law of supply with graph?

30.WriteCharacteristics of monopoly and oligopoly

31.What is public revenue? What are main sources for public revenue?

32. Write briefly about elasticity of demand?

**SYLLABUS**

**Subject: Agriculture and Rural DevelopmentSemester: I**

**Course Title: Fundamentals of HorticultureCourse Code: HORT181**

**No. of Hours:30 Hrs. Credits: 2**

**Objectives:**

* Toidentify garden tools.
* Toidentify horticultural crops.
* Topreparedifferent types nursery beds.

**Course Outcomes**

At the end of the course, students will be able to

**CO1:**Define, classify and outline the climate and soil conditions for horticultural crops.

**CO2:** Explain principles and methods of plant propagation, training and pruning.

**CO3:** Summarize principles and steps in establishment of various orchards and types and purposes of gardens.

**CO4:** Discuss unfruitfulness, pollination and fertilization.

**CO5:**List medicinal and aromatic plants, spices and condiments and explain the role of plant bio regulators, irrigation and fertilizers in horticulture crops.

**UNIT-I: (6Hrs.)**

1. Definition of Horticulture - Division of Horticulture - Pomology, Olericulture, Floriculture, spices & Condiments, Medicinal and Aromatic plants, Ornamental and Landscape architecture and Post-Harvest Technology etc. Importance of horticulture in national economy and in human nutrition. Scope ofHorticulture
2. Horticultural & Botanical classification – Fruits, Vegetables, Ornamental plants, Spices and Plantationcrops
3. Climate and soil for horticultural crops – Temperature, Rainfall, Relative humidity, Wind, Soil organic matter, Soil pH, Soil air, soil Water etc.

**UNIT-II: (6Hrs.)**

1. Plant propagation methods - sexual asexual and micro propagation. Plant Propagation structures – Polyhouses, Net houses, Plastic tunnels and Mist chambers
2. Principles of orchard establishment – selection of site – Steps in establishment of orchard

– clearing of the land – leveling – fencing – purpose of raising fence – live and non-live fences – good fence plant characters – examples of live and non-live fences – wind breaks – roads – drains – tillage – sowing green manure crops – marking plant positions – digging and filling of pits – selection of plants from the nursery – lifting and packing of plants – season of planting – planting and healinginn

1. Principles and Methods of training and pruning – training – definition – objectives of training fruit trees – reasons for training – methods of training – central leader, open center and modified leader systems with merits and demerits
2. Pruning – definition – reasons for pruning – objectives of pruning – responses of plants to pruning – activation of buds, dwarfing response, production of water shoots and delay in bearing – methods of pruning – thinning out, trimming, heading back, pollarding, pinching, disbudding and deblossoming – seasons of pruning – pruning and manuring – care of pruned woods – Juvenility and flower buddifferentiation

**UNIT-III: (6 Hrs.)**

1. Unfruitfulness in fruit trees – causes – environmental causes, nutritional causes, inherent causes, biological causes and cultural causes and theirremedies
2. Pollination, pollinizers, and pollinators
3. Fertilization and parthenocarpy

**UNIT-IV: (6 Hrs.)**

1. Kitchen gardening
2. Garden types and parts

3. Lawn making

**UNIT-V: (6 Hrs.)**

1. Medicinal & Aromaticplants
2. Spices andCondiments
3. Plant bio regulators - growth regulators and plant hormones – types of growth regulating substances – use of growth regulators in propagation – rooting of cuttings, induction of rooting in layering, union of rootstock and scion in grafting and budding, control of flowering, fruit set, fruit drop, parthenocarpy, fruit ripening, fruit size, quality and sex expression – preparation of growth regulators – powder, solution and lanolinpaste
4. Irrigation & fertilizers application – method andquantity

**References Text Books:**

1. Adams, C.R. and M. P. Early. 2004. Principles of horticulture. Butterworth – Heinemam, Oxford University Press.
2. Prasad and Kumar. 2014, Principles of Horticulture 2ndEdn. Agro bios (India)
3. Kumar, N.1997. Introduction to Horticulture, Rajalakshmi Publication, Nagercoil.

**MODEL QUESTION PAPER**

**Subject: Agriculture and Rural Development Semester: I**

**Course Title: Fundamentals of Horticulture Course Code: HORT181**

**Time: 3Hrs. Max. Marks: 100**

**SECTION-A**

**Answer ALL questions:201 = 20 M**

1. Which of the following branch deals with the raising of perennial trees meant for shade, avenue or ornamental purposes?

1. Pomology
2. Olericulture
3. Arboriculture
4. Plantation crops

2. Which of the following is the important source of vitamin –A.

1. Carrot
2. Lime
3. Lemon
4. All the above

3. Jammu & Kashmir comes under which climatic zone.

1. Tropical zone
2. Sub-tropical zone
3. Temperate zone
4. None of the above

4. Root stocks are usually propagated through.

1. Seeds
2. Stem cuttings
3. Root cuttings
4. All the above

5. Which of the following are the components of the soil.

1. Sand
2. Silt
3. Clay
4. All the above

6. Multiplication of the plants by seed is called as.

1. Sexual propagation
2. Asexual propagation
3. Both a & b
4. None of the above

7. Potatoes are propagated by.

1. Bulbs
2. Corms
3. Tubers
4. None of the above

8. Example of Rhizomes.

1. Banana
2. Ginger
3. Strawberry
4. Onion

9. In Semi-hard wood stem cuttings, which type of wood is preferred for propagation.

1. Matured
2. Partially matured
3. Succulent
4. None of the above

10.The angle made by the scaffold limb to the trunk or the secondary branch to the scaffold limb is

1. Crotch
2. Trunk
3. Head
4. Water shoot

11. Study of vegetables are called as \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

12. Trimming is a method of \_\_\_\_\_\_\_\_\_\_\_\_\_\_.

13. The term fertilization was first discovered by \_\_\_\_\_\_\_\_\_\_\_.

14. The transfer of pollen from anther to stigma called as \_\_\_\_\_\_.

15. Development of fruits without fertilization is called as \_\_\_\_\_\_\_\_\_.

16. Coffee, Tea and Rubber are the examples of \_\_\_\_\_\_\_\_\_\_\_\_\_\_.

17. The state where the plants not capable of flowering and bearing is known as\_\_\_\_\_\_\_\_\_\_\_\_\_.

18. Arrangement of plants in the orchard is known as\_\_\_\_\_\_\_\_\_\_.

19. Example for auxins\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

20. Spices add \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to the food.

**SECTION-B**

**Answer any FOUR questions: 48 = 32 M**

21. Definition of Horticulture and write down the branches of horticulture with examples.

22. Write down the importance and scope of Horticulture.

23. Explain different Horticultural zones of India.

24. Which environmental factors influence the Horticultural crop production? Explain briefly?

25. Write down the advantages and disadvantages of sexual and asexual propagation.

26. What is lay out? Explain different systems of planting with diagrams.

**SECTION-C**

**Answer any FOUR questions: 412 = 48 M**

27.Why we need to carry out the pruning and training operations and what principles need to be followed while training the plants?

28. Write down the steps in establishment and management of orchard?

29. What is unfruitfulness in fruit trees, what are the causes and their remedies?

30. Define drainage explain advantages and disadvantages of irrigation.

31. Briefly discuss about fertilization and parthenocarpy?

32. Define and list out each of ten spices and condiments?

**PRACTICAL SYLLABUS**

**Subject: Agriculture and Rural Development Semester: I**

**Course Title: Fundamentals of Horticulture-Practical**

**Course Code: HORT181P**

**No.of Hours:30 Hrs.** **Credits: 1**

**Objectives:**

* To identify of garden tools.
* To identify of horticultural crops.
* To apply grafting and budding methods.

**Course Outcomes:**

**CO1:**Students will able to identify plant vegetative structure.

**CO2:**Students will understoodto basic principles, processes and plant propagation methods.

**CO3:**Students will understand how to propagate plant, manage and harvest a variety of plant.

**CO4:**Students will understand how to propagate plant, manage and harvest a variety of plant.

**CO5:**Students will understand recognize various crop harvesting, transportation, and processing.

**EXPERIMENTS:**

1. Identification of garden tools. **(6 Hrs.)**
2. Identification of horticulturalcrops. **(6 Hrs.)**
3. Preparation of seed bed / nurserybed. **(6 Hrs.)**
4. Grafting &Budding. **(6 Hrs.)**
5. Transplanting and care of vegetableseedlings. **(6 Hrs.)**

**Scheme of Evaluation:**

|  |  |  |
| --- | --- | --- |
| **S.No.** | **Experiment** | **Marks (50)** |
| 01 | Major Experiment | 15Marks |
| 02 | Minor Experiment | 10Marks |
| 03 | Viva | 10Marks |
| 04 | Record | 10Marks |
| 05 | Skills | 05Marks |

**SYLLABUS**

**Subject: Agriculture and Rural development Semester: I**

**Course Title: Rural Sociology, Educational Psychology and Human Values**

**Course Code: AEXT191**

**No. of Hours: 30 Hrs. Credits: 2**

**Objectives:**

* To learn importance of rural sociology in agricultural extension.
* To learn culture and different cultural concepts in agricultural extension.
* To learn personality development and leadership qualities.
* To learn principals of Ethics and Morality.

**Course Outcomes**

At the end of the course, students will be able to

**CO1:**Explain the relevance of rural sociology in agricultural extension, characteristics of rural society, classification and stratification of social groups.

**CO2:** Outline cultural concepts and social values, classification and training of leaders.

**CO3:** Summarize the meaning, scope and importance of educational psychology in agricultural extension.

**CO4:**Explain meaning, definition and stepsof extension teaching and risk benefit analysis.

**CO5:** Summarize the implications of competence and professional ethics, collegiality and loyalty.

**UNIT-I: (6Hrs.)**

1. Sociology and rural sociology, extension education, agricultural extension - meaning and definitions

2. Importance of rural sociology in agricultural extension and their interrelationship

3. Characteristics of Indian, rural society - differences and relationships between rural and urban societies

4. Social group(s) - classification - formation and organization of groups role of social groups in agricultural extension

5. Social stratification - meaning - forms - class system and caste system

**UNIT-II: (6Hrs.)**

1. Culture and different cultural concepts and their role in agricultural extension

2. Social values, social control and attitudes types and their role in agricultural extension

3. Leadership - meaning - classification of leaders - roles of a leader and different methods in selection of a leader

4. Training of leaders - lay and professional leaders - advantages and limitations in using local leaders in agricultural extension

5. Psychology and educational psychology - meaning - scope and importance

**UNIT-III (6Hrs.)**

1. Intelligence - meaning - types - factors and importance in agricultural extension

2. Personality - meaning - types - factors and importance in agricultural extension

3. Perception, emotions, and frustration - meaning - types - factors and importance in agricultural extension,

4. Motivation - meaning - types of motives - theories of motivation importance of motivation in agricultural extension

5. Teaching, learning, learning experience and learning situation - meaning and definition -elements of learning situation and its characteristics

**UNIT-IV: (6Hrs.)**

1. Principles of learning and their implications in teaching - steps in extension teaching

2.Variety of moral issues (part-1): - Understanding the harmony in the society (society being an extension of the family), Integrity, work ethic, Courage, Empathy,

3.Variety of moral issues (part-2): -Self-confidence, Moral Autonomy, Concensensus and Controversy, Professional and Professionalism, Professional idea, and virtues.

4. Principles of Ethics and Morality (part-1): - Ethics as a Subset of Morality, Ethics and Organization, Employee, Duties and Rights.

5. Principles of Ethics and Morality (part 2): Discriminatory and Pre-judicial employee practices, Understanding harmony in nature, Natural acceptance of human values.

6. Risk benefit analysis (part-1): - Reducing risk, the government regulators, approach to risk, handling ethical dilemmas at work.

**UNIT-V: (6Hrs)**

1. Risk benefit analysis (part-2): - Market strategy and ethics, ethical practice in marketplace, ethics in finance,ethics in business and environment.

2. Collegiality and loyalty (part-1): - Respect of authority, collective bargaining, confidentiality, professional rights.

3. Collegiality and loyalty (part-2): -Intellectual property rights, multinational corporation and ethical investing, computer and ethics, management patterns

4. Competence and professional ethics: -

I. Ability to utilize the professional competence and augmenting universal human order

II. Ability to identify the scope and characteristic people friendly and eco-friendly production

III. Ability to identify and develop appropriate technologies and management and pattern for above production system

5. Strategy for transition from the present state to universal human order

I. At the level of individual- as socially and ecologically responsible technologies and managers

II. At the level of society- as mutually enriching institutions and organizations

1. Case studies of typical holistic technologies and management patterns.

**References Text Books:**

1. Adivi Reddy, A. 2001. Extension Education. Sri Lakshmi Press, Bapatla.
2. Chitamber, J.B. 1997. Introductory Rural Sociology. Wiley Eastern Limited, New Delhi.
3. Daivadeenam, P. 2002. Educational Psychology in Agriculture. Agrotech Publishing Academy, Udaipur.
4. Mangal, S.K. 2000. Educational Psychology. Prakash Brothers, Ludhiana.

**Model Question Paper**

**Subject: Agriculture and Rural Development Semester: I**

**Course Title: Rural Sociology, Educational Psychology and Human Values Course Code: AEXT191**

**Time: 3Hrs.Max. Marks: 100**

**SECTION-A**

**Answer ALL questions:201 = 20 M**

1. Extension education is informal education for the rural people with a view to------- rural society

1. Maintain
2. To guide
3. Develop
4. Control

2.Extension education makes use of social data as a basis for building up extension

1. Programs
2. Work
3. Knowledge
4. All the above

3. ------------ is the main economic activity of rural people.

1. Aquaculture
2. Agriculture
3. Business
4. Industries

4. The chief character of rural life in ------------------ regarding to income education. .

1. Costlier
2. Holocentric
3. Homogeneous
4. Hetrogeneous

5. Density of population is -----------in rural communities .

* 1. Less
  2. More
  3. More or less
  4. None of the above

6. Most of the people belongs to ----------type of personalitie.

1. Introvert
2. Extrovert
3. Dominant
4. Ultimate

7. Freedom speech is an example of-------- value.

* 1. Intermediate
  2. Specific
  3. Ultimate
  4. Dominant.

8. Good manners are example for

1. Ritual
2. Tradition
3. Folkways
4. Convention

9. Example of professional leader is

* 1. Politicalleader
  2. M.R.O
  3. Inspector
  4. Student leader

10. Sales man, politicians are possess------------- type of intelligence.

1. Mechanical
2. Concrete
3. Abstract
4. Social.

11. Monogamy is an example for\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

12. The last step in extension teaching is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

13. An ideal person will have \_\_\_\_\_\_\_\_\_\_\_\_intelligence.

14. Freedom of speech is example for\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

15. This values are unlimited in number \_\_\_\_\_\_\_\_\_\_.

16. Give examples of positive Emotions \_\_\_\_\_\_.

17. Alphabets and numbers are related to \_\_\_\_\_\_\_\_\_\_\_\_.

18. Good manners examples are \_\_\_\_\_\_\_\_\_\_\_\_\_\_

19. Who is the author of introductory rural sociology\_\_\_\_\_\_\_\_\_\_\_\_.

20. Examples of Professional leader\_\_\_\_\_\_\_\_\_\_\_\_.

|  |
| --- |
|  |

**SECTION-B**

**Answer any FOUR questions:48 = 32 M**

21. Explain characteristics of Indian rural society.

22. Inter relationship between rural sociology and extension.

23. Describe the social control and write the importance of social control on extension education. Explain the role of leader in a group &in extension.

24. Explain the factors affecting intelligence in human behavior.

25. The five elements of a learning situation-explain with diagram.

26. Theories of motivation according to MASLOWS classification of needs explain with diagram.

**SECTION-C**

**Answer any FOUR questions:412 = 48 M**

27. Brief note on Elements of social of social groups?

28. Write importance of employee duties.

29.Importance of psychology in agriculture extension.

30. Write about characteristics of rigid caste system in Indian society.

31. Described about democratic leader.

32. What are the principals of Ethics and Morality.

**SYLLABUS**

**Subject: Agriculture and Rural Development Semester: I**

**Course Title: Vermicompost Production Course Code: SDCVP**

**No. of Hours: 30Hrs. Credits:****2**

**Objectives:**

* To preparevermicompost pit.
* To preparevermicompost.
* To apply fertilizers to crops.

**Course Outcomes**

At the end of the course, students will be able to

**CO1:**Identify raw materials needed for vermicomposting.

**CO2**: Demonstrate the preparation and management ofvermicompost beds.

**CO3:** Explain nutrient value of vermicompost and advantages and disadvantages of vermicomposting.

**PRACTICAL**

**UNIT-I: (6 Hours)**

1. Introduction to Vermicompost - History, definition

2. Brief description methods of preparation of vermicompost

**UNIT-II: (6 Hours)**

1. Procedure for preparation of vermicompost by step by step

2. Materials used for vermicompost bed of greenhouses

**UNIT-III: (6 Hours)**

1. Maintenance of vermicompost bed

**UNIT-IV: (6 Hours)**

1. Nutrient value for vermicompost

**UNIT-V: (6 Hours)**

1. Advantages and Disadvantages in Vermicompost.

**Reference Text Books:**

1. Kurien, J., and Ramasamy, E.V. 2006. **Vermicomposting of Taro (**Colocasiaesculenta**) with two epigeic earthworm species**. Bioresource Technology **97(11):**1324-1328.
2. Monroy, F., Aira, M., Dominguez, J., and Velando, A. 2006. **Seasonal population dynamics of Eiseniafetida (Savigny, 1826) (Oligochaeta, Lumbricidae) in the field.** ComptesRendusBiologies **329(11):**912-915.
3. Nair, J., Sekiozoic, V., and Anda, M. 2006. **Effect of pre-composting on vermicomposting of kitchen waste**. Bioresource Technology **97(16):**2091-2095.
4. Suthar, S. 2006. **Potential utilization of guar gum industrial waste in vermicompost production**. Bioresource Technology **97(18):**2474-2477.