2nd YEAR	IV SEM	1.	**Principles of Organic Farming** (Core subject)	4+2=6
		2.	**Fundamentals of Crop Physiology** (Core subject)	4+2=6
		3.	**Principles of Seed Technology** (Core subject)	4+2=6
		4.	**Breeding of Field Crops** (Core subject)	4+2=6
		5.	**Introduction to Production Economics and Farm Management** (Core subject)	4+2=6
		6.	**Horticulture** (Core subject)	4+2=6
				Credits 24+12=36

ANDHRA UNIVERSITY
B. Vocational course
AGRICULTURE
2020-21 Admitted Batch
II Year – Semester IV

PRINCIPLES OF ORGANIC FARMING(CREDITS 4+2=6)

UNIT - I

- Organic farming – definition – need – scope – principles – characteristics - relevance to modernagriculture.
- Different eco friendly farming systems- biological farming, natural farming, regenerativeagriculture–permaculture-biodynamicfarming.
- Relevance of organic farming to A.P, India, and global agriculture and future prospects-advantages -barriers.

UNIT - II

- Initiatives taken by the central and state governments, NGOs and other organizations for promotion of organic agriculture inIndia.
- Organic nutrient sources and their fortification – organic manures- methods of composting
- Greenmanures-biofertilisers–types,methodsofapplication–benefitsandlimitations.

UNIT - III

- Nutrient use in organic farming-scopeand limitations.
- Nutrient management in organicfarming.
- Organic ecosystem and theirconcepts.
- Choiceofcropsandvarietiesinorganicfarming–croprotations–needandbenefits – multiple cropping.

UNIT - IV

- Fundamentals of insect, disease and weed management under organic mode of production-cultural-biological methods-non chemical pest &disease management.
- Botanicals- pyrethrum, neem seed kernel extract, neem seed powder, soluble neem formulations, neemoil.
- OperationalstructureofNPOP–otheragenciesfororganicproduction.

UNIT - V

- Inspection – certification - labelling and accreditation procedures fororganic products.
- Processing, - economic consideration andviability.
- Marketingandexportpotentialoforganicproducts–nationaleconomy

PRINCIPLES OF ORGANIC FARMING (PRACTICAL)

1. Visit to organic farm to study the various components, identification and utilisation of organicproducts.
2. Compost making- aerobic and anaerobicmethods
3. Vermicompostpreparation
4. Preparation of enriched farm yardmanure
5. Visit to organic clusters and bio control lab to study the maintenance of bio-fertilizers/bio-inoculantcultures
6. Biological nitrogenfixers.
7. Methods of application of Bio-pesticides (Trichocards, BT,NPV)
8. Preparation of neem products and other botanicals for pest and diseasecontrol
9. Preparation of green pesticides (panchagavya,beezamrutam,jeevamrutam, ghanajeevamrutam,dravajeevamrutam).
10. Different methods of biofertiliserapplications.
11. Quality analysis of biofertilisers/bioinoculants andcompost
12. Case studies of Indigenous Technical knowledge e (ITK) for nutrient , insect, pest, disease and weedmanagement
13. Economic analysis of organic productionsystem
14. Study of post harvest management in organicfarming
15. Study of quality parameters of organicproduce
16. Visit to organic farms to study the various components and theirutilization

References

1. ArunK.Sharma.2002.AHandbookoforganicfarming.Agrobios,India.627p.
2. Palaniappan, S.P and Annadurai, K.1999. Organic farming-Theory and Practice. Scientific publishers, Jodhpur,India.257p.
3. Mukund Joshi and Prabhakarasetty, T.K. 2006. Sustainability through organic farming. Kalyani publishers, New Delhi.349p.
4. Balasubramanian, R., Balakishnan, K and Siva Subramanian, K. 2013. Principles and practicesoforganicfarming.SatishSerialPublishingHouse.453p
5. Tarafdar, J.C., Tripathi, K.P and Mahesh Kumar, 2009. Organic agriculture. Scientific Publishers, India.369p.
6. Tiwari, V.N., Gupta, D.K., Maloo, S.R and Somani, L.L. 2010. Natural, organic, biological, ecological and biodynamic farming. Agrotech Publishing Academy, Udaipur.420p.
7. Dushyent Gehlot. 2005. Organic farming- standards, accreditation, certification and inspection. Agrobios, India.357p

ANDHRA UNIVERSITY
B. VOCATIONAL COURSE
AGRICULTURE
2020-21 Admitted Batch
II Year Semester- IV
PRINCIPLES OF ORGANIC FARMING
MODEL QUESTION PAPER
SECTION – A

Time:3Hours Maximum: 75Marks

Answer any FIVE questions. Each question carries equal marks. (5*5=25)

1. What are the essential characteristics of Organic Farming?
2. What is Vermicomposting and write about Vermiculture.
3. What are the desirable characters of Green Manuring?
4. Write about the use of Bio fertilizers in Organic Faring?
5. Write about weed management in Organic farming.
6. Write breifly about Regenerative Agriculture.
7. Write about the Economic considerations of Organic Culture.
8. Write about different types of Biofertilizers used in Organic Farming.

SECTION-B

Answer all the questions. Each question carries TEN marks. (5*10=50)

1. a) Write about the Principles of Organic farming.

(OR)

b) What are the components in organic farming for Sustainable crop production?

2. a) What are the Advantages of Organic farming?

(OR)

b) What are the Government policies on promoting Organic farming?

3. a) Write about different types of Organic manures.

(OR)

b) Write briefly about Biological methods of Insect pest Management in Organic farming?

4. a) Write about the Operational structure of NPOP.

(OR)

b) Write about the Accredition procedures for Organic Products.

5. a) Write about the concepts of Organic ecosystem.

(OR)

b) Write about the Marketing and Export potential of Organic farming.

ANDHRA UNIVERSITY
B. VOCATIONAL COURSE
AGRICULTURE
2020-21 Admitted Batch
II Year Semester- IV
FUNDAMENTALS OF CROP PHYSIOLOGY
(CREDITS 4+2=6)

UNIT – I

Introduction to Crop Physiology and its importance in Agriculture.

Plant cell - The endomembrane system - Plasma membrane, endoplasmic reticulum, nuclear envelope, golgi apparatus, vacuole and endosomes - Structure and functionalcharacteristics -Plastids,mitochondria,oilbodies,peroxisomesandglyoxysomes-Structureandfunctions.

UNIT – II

Absorption of water - Diffusion and osmosis - water potential and its components - Importance of water potential – Active and passive uptake of water – Stomatal complex – Transpiration – Water use efficiency – Water use efficiency of C3, C4 and CAM plants – Water requirement / Transpiration ratio

Factors affecting WUE.

Mineral nutrition of plants – Essential mineral elements – Criteria of essentiality of mineral elements – Mengel`s classification of mineral nutrients - Nutrient uptake mechanisms - Functional roles of N, P, K, S Ca and Mg – Functional roles of Fe, Mn, Cu, Zn, B, Mo, Cl, Na, Co and Si –Deficiency symptoms of macro and micro nutrients.

Assimilation of mineral nutrients – Nitrate assimilation – Ammonium assimilation in plants – Biological nitrogen fixation – Free-living and symbiotic bacteria – Nodule formation – Nitrogenase enzyme complex.

UNIT – III

Photosynthesis – Reactions of photosynthesis – Energy synthesis – Principle of light absorption by plants – Light reactions - Cyclic and non cyclic photophosphorylation – CO2 fixation – C3 and C4 pathways – Significance of C4 pathway – CAM pathway and its significance – Photorespiration and its significance – Photosynthetic efficiency of C3, C4 and CAM plants - Factors affecting photosynthesis (light, CO2, temperature and water stress) - Relationship of photosynthesis and crop productivity.

Respiration – Energy balance – Significance of respiration – Oxidative Pentose Phosphate Pathway (OPPP) and its significance – Growth respiration and maintenance respiration – Alternate respiration – Salt respiration – Wound respiration.

Lipid metabolism – Biosynthesis of fatty acids in plastids – Functions of lipids Significance of lipids in plant metabolism.

UNIT – IV

Physiology of flowering – Photoperiosism and flowering – Importance of photoperiodism – Classification of plants based on photoperiodicresponses

Perception of photoperiodic stimulus – Biological clock – Phytochrome – Flowering hormones – Vernalization and flowering – importance of vernalization inagriculture.

Plant growth regulators – Auxins – Occurrence, transport, biosynthesis, mode of action and physiological roles – Commercial uses.– Gibberellins – occurrence, transport, biosynthesis, mode of action and physiological roles – Commercial uses – Cytokinins – Occurrence, transport, biosynthesis, mode of action and physiological roles – commercial uses – ABA – Occurrence, transport, biosynthesis, mode of action and physiological roles

Commercialuses–Ethylene–Ocurrence,transport,biosynthesis,modeofactionand physiological roles – Commercial uses.

Senescence and abscission – Definition – Classification of senescence – Physiological and biochemical changes that occur during senescence - Prevention of leaf and flower senescence – Abscission and its relationship withsenescence.

UNIT – V

Post harvest physiology – Dormancy – Types of dormancy – Advantages and disadvantages of dormancy - Causes of dormancy – Remedial measures for breaking seed dormancy - Fruit ripening - Climacteric and non climacteric fruits – Metabolic changes during fruit ripening - Hormonal regulation of fruit ripening – Ripening induction and ripening inhibition – Use of hormones in increasing vase life of flowers. Metabolic changes during seed development - Seed viability and seed vigor - Tests of viabilityandvigor- Physiologicalmaturity, harvestablematurity- Indices of physiological maturity in crops - Seed germination - Metabolic changes during seed germination.

FUNDAMENTALS OF CROP PHYSIOLOGY (PRACTICAL)

Solutions- Preparation, Seed vigor and viability tests, optimum conditions for seed germination,leafareameasurement,Growthanalysis,Measurementofwaterstatusinplants, Measurement of water potential, Measurement of Stomatal frequency and index photosynthetic pigments- Absorption spectrum , Leaf anatomy of C3 and C4 plants, Measurement of photosynthesis – Hill's reaction, Measurement of photosynthesis by IRGA,Effectofplantgrowthregulatorsonplantgrowth.Diagnosisofnutrientdeficiency symptoms in crops, Yieldanalysis

References

Taiz, L. and Zeiger, E. 2010. *Plant Physiology* 5th edition, Sinauer Associates, Sunderland, MA, USA.

Gardner, F.P., Pearce, R.B., and Mitchell, R.L. 1985. *Physiology of Crop Plants.* Scientific Publishers, Jodhpur.

Noggle, G.R. and Fritz, G.J., 1983. *Introductory Plant Physiology.* 2nd Edition. Prentice Hall Publishers, New Jersey, USA.

ANDHRA UNIVERSITY
B. VOCATIONAL COURSE
AGRICULTURE
2020-21 Admitted Batch
II Year Semester- IV
FUNDAMENTALS OF CROP PHYSIOLOGY
MODEL QUESTION PAPER
SECTION – A

Time:3Hours Maximum: 75Marks

Answer any FIVE questions. Each question carries equal marks. (5*5=25)

1. Write about the structure and functions of Endoplasmic Reticulum.
2. Write about the Factors effecting the Water use Efficiency.
3. Write about Non cyclic Phosphorylation.
4. Write Briefly about Biological Nitrogen fixation.
5. Describe the classification of plants based upon Photoperiodism.
6. Write about the types of Senescence.
7. What are the factors effecting Fruit ripening and write about climacteric and non-climacteric fruits.
8. Write about the metabolic changes during Seed development.

SECTION-B

Answer all the questions. Each question carries TEN marks. (5*10=50)

1. a) Elaborate the structure and function of Cell wall in plants.

(OR)

b) Write about the Chloroplasts and describe its ultra structure.

2. a) Write about the components of Water potential and its Importance.

(OR)

b) Write breifly about the Functions of NPK in nutrition of Plants.

3. a) Write about C4 Photosynthetic carbon assimilation cycle.

(OR)

b) Explain Oxidative Pentose pathway and its significance.

4. a) Write about the Physiological role of Auxins in Plants.

(OR)

b) Write about Physiological and Biochemical changes that occur during Senescence and methods to prevent leaf and flower senescence.

5. a) Elucidate the remedial measures for breaking Seed dormancy.

(OR)

b) Write about tests of seed viability and vigor.

ANDHRA UNIVERSITY

B. VOCATIONAL COURSE
AGRICULTURE
2020-21 Admitted Batch
II Year Semester- IV
PRINCIPLES OF SEED TECHNOLOGY
(CREDITS 4+2=6)

UNIT I - Introduction to seed and seed quality

Seed - definition - Seed structure - Seed development and maturation Germination - phases of seed germination

Dormancy - types of seed dormancy - Seed senescence - causes of seed senescence Seed quality characteristics - significance

Classes of seed - Generation system of seed multiplication in seed supply chain .

UNIT II - Principles of seed production

Seed replacement rate and varietal replacement - Seed Multiplication Ratio - Seed renewal period. Causes of varietal deterioration and maintenance Genetic and agronomic principles of seed production Factors affecting quality seed production

Methods of seed production of varieties andhybrids.

UNIT III - Seed production techniques of agriculturalcrops

Floralbiologyandpollinationbehavior-seedproductiontechniquesofvarietiesandhybrids of: rice, maize, cotton varieties and hybrids – Btcotton

UNIT IV - Seed production techniques of vegetable crops

Floralbiologyandpollinationbehavior-seedproductiontechniquesofvarietiesandhybrids of: tomato, snakegourd, bittergourd ,ashgourd, ribbed gourd andbottlegourd

UNIT V - Post harvest seed handling techniques Threshing - methods

Drying - methods of seed drying - advantages and disadvantages Seed processing – definition - importance

Seed cleaning and grading - upgrading - equipments - working principles

Seedtreatment-importance-types-Seedinvigourationtechniques-seedhardening-seed fortification - seed priming - Seed enhancement techniques - seed coating - seedpelleting.

PRINCIPLES OF SEED TECHNOLOGY (PRACTICAL)

1. Study of seed structure of agricultural and horticulturalcrops.
2. Seed dormancy breakingmethods.
3. Acid delinting incotton.
4. Detasseling techniques for hybrid seed production inmaize.
5. Emasculation and dusting techniques for hybrid seed production in important fieldcrops.
6. Practicing pre-germinative techniques , enhancing floral ratio and improving seed set in cucurbits
7. Fruit grading and seed extraction methods in vegetables - tomato, brinjal, chillies, bhendi andcucurbits.
8. Seed cleaning and grading techniques and detection of seed mechanicalinjury.
9. Collection ofseeds.

ANDHRA UNIVERSITY
B. VOCATIONAL COURSE
AGRICULTURE
2020-21 Admitted Batch
II Year Semester- IV
PRINCIPLES OF SEED TECHNOLOGY
MODEL QUESTION PAPER
SECTION – A

Time:3Hours Maximum: 75Marks

Answer any FIVE questions. Each question carries equal marks. (5*5=25)

1. Explain the safe guards for maintenance of genetic purity of seed.
2. Write a note on seed production methods for hybrids.
3. Explain seed production technology of Cotton.
4. What is seed dormancy? Explain different types seed dormancy?
5. Write about different classes of seeds.
6. Write about seed production technology of cucurbits.
7. What are the factors affecting quality seed production.
8. what is senescence? Write about significance along with it's causes.

SECTION-B

Answer all the questions. Each question carries TEN marks. (5*10=50)

1. a) Give a detailed note on seed production technology of Rice.

(OR)

b) Discuss the procedure followed for Maize seed production technology.

2. a) Explain generation system of seed multiplication in seed supply chain.

(OR)

b) What is seed drying and explain different methods of seed drying along with principles and requirements.

3. a) Write about seed production technology of Tomato.

(OR)

b) Describe planning, layout and establishment of seed processing plant.

4. a) Write about seed cleaning and grading.

(OR)

b) Write a detailed note on importance, types and equipment required for seed treatment.

5. a) i) Describe the causes of varietal detioration.
ii) Write the procedures for seed production of varieties.

(OR)

b) What is seed? Explain seed structure and phases of it's germination.

ANDHRA UNIVERSITY
B. VOCATIONAL COURSE
AGRICULTURE
2020-21 Admitted Batch
II Year Semester- IV
BREEDING OF FIELD CROPS
(CREDITS 4+2=6)

Place of origin – putative parents – related wild species – classification – objectives of breeding-methods of breeding – quantity – quality – stress – conventional – innovative – heterosis breeding – distant hybridization and important varieties in following crops.

UNIT–I: Cereals

Rice, Wheat, Grain and fodder Maize, Grain and fodder Sorghum

UNIT – II: Millets

Pearl millet , Finger millet , Foxtail millet, Kodo millet, Little millet, Proso millet, Barn yard millet**.**

UNIT–III : Pulses

Red gram, Bengal gram, Green gram, Black gram, Soybean, lab – lab

UNIT – IV: Oilseeds

Groundnut, Sesame, Mustard, Sunflower and Safflower, Coconut, Oil palm

UNIT–V : Fibres and Sugars Cotton, Jute, Mesta, Sugarcane, Sugar beet

BREEDING OF FIELD CROPS (PRACTICAL)

Observation on floral biology – anthesis and pollination – selfing and crossing techniques – observation on wild species – maintenance of crossing ledger – pedigree record – in following crops.

1. Rice,Wheat
2. Maize,Sorghum
3. Pearl Millet, Finger Millet, LittleMillet
4. Kodo Millet, Barn Yard Millet, Proso Millet and FoxtailMillet.
5. Red gram Bengal Gram, Green Gram, Black Gram, Soybean, Lab –Lab.
6. Groundnut, Sesame,Mustard.
7. Sunflower,Safflower.
8. Coconut And Oilpalm
9. Cotton, Jute andMesta
10. Sugarcane And SugarBeet

ANDHRA UNIVERSITY
B. VOCATIONAL COURSE
AGRICULTURE
2020-21 Admitted Batch
II Year Semester- IV
BREEDING OF FIELD CROPS
MODEL QUESTION PAPER
SECTION – A

Time:3Hours Maximum: 75Marks

Answer any FIVE questions. Each question carries equal marks. (5*5=25)

1. Draw the flowcharts for origin of Diploid, Tetraploid and Hexaploid Wheat.
2. Write about the latest classification of Sorghum given by Harlan and De Wet.
3. Write about the 3 basic type of crosses made in Hybridization of Sugar cane?
4. What are the main reasons for Low yields of Pulses compared to Cereals.
5. Write about the Prognetarors and desirable plant type in Chick pea.
6. Write about the types of cultivated species in Cotton.
7. Write about the classification of Cultivated Species of Rice?
8. Write about Breeding techniques of Finger millet.

SECTION-B

Answer all the questions. Each question carries TEN marks. (5*10=50)

1. a) Write about the breeding techniques for developing Hybrid Rice.

(OR)

b) Elucidate the Objectives of Plant Breeding.

2. a) Write about the Objectives for Breeding of Red Gram.

(OR)

b) Write about the classification of Ground Nut and why it is called as an unpredictable crop.

3. a) Explain Head to row and remnant seed method and Hetrosis breeding in Sunflower.

(OR)

b) Write about the Taxonomy of Brassica crops and their economic characters.

4. a) Write elaborately about the Breeding procedures in Cotton.

(OR)

b) Write about bolting and Photoperiod induction in Sugar beet.

5. a) Write about the Breeding procedures for disease and abiotic stress resistance in Sugar cane.

(OR)

b) Write about the Breeding objectives of Soybean.

ANDHRA UNIVERSITY
B. VOCATIONAL COURSE
AGRICULTURE
2020-21 Admitted Batch
II Year Semester- IV
INTRODUCTION TO PRODUCTION ECONOMICS AND FARM MANAGEMENT
(CREDITS 4+2=6)

UNIT 1: Production Economics and Farm Management - Nature and Scope

Production Economics: Meaning, Definition and Nature and Scope – Farm Management: Definition and Objectives of farm management – Production Economics Vs. Farm Management – Farm Management Decisions: Decision making process – Scope of farm management – Types and Systems of farming: Types – Specialized, Diversified, andMixed farming–Systemsoffarming:PeasantFarming,StateFarming,Capitalistic,Collectiveand Co – operativeFarming.

UNIT 2: Factor – Product Relationship

Factor – Product relationship: Meaning – Agricultural Production Function: Meaning, Definition – Laws of Returns: Increasing, Constant and Decreasing Returns – Classical production function and Three stages of production – Elasticity of production –Types / FormsofProductionfunctions–Linear,Cobb–DouglasandQuadratic–CostConceptsand Cost curves: Total, Average and Marginal Costs – Economies of Scale – Economies ofSize - Determination of Optimum Input and Output – Physical and Economic Optimum.

UNIT 3: Factor – Factor Relationship

Factor – Factor relationship: Meaning - Isoquant: Definition and Types, Isoquant map – MarginalRateofTechnicalSubstitution–FactorIntensity–Isocline–RidgeLine–Returns to Scale – Elasticity of Factor Substitution – Isocost line – Principle of Factor Substitution and Least Cost Combination of inputs – Expansion Path – Effect of input price changes on the least costcombination.

UNIT 4: Product – Product Relationship

Product – Product relationship: Meaning – Production Possibility Curve – Marginal Rate of Product Transformation – Enterprise relationship: Joint Products, Complementary, Supplementary and Competitive Products – Isorevenue line – Optimum Combination of Products – Principle of Equi–Marginal Returns – Principle of Opportunity Cost and Minimum Loss Principle.

UNIT 5: Farm Planning and Budgeting

Farm Planning: Importance – Characteristics of good Farm Plan – Farm planning procedure – Budgeting: Definition and Types: Partial budgeting, Enterprise budgeting, Complete budgeting and Cash flow budgeting – Limitations of budgeting – Linear Programming: Assumptions–LinearProgrammingModel:Definition,Graphicalsolution,Advantagesand Limitations – Risk and Uncertainty: Definition – Types of Risk and Uncertainty – Safeguards against Risk and Uncertainty.

INTRODUCTION TO PRODUCTION ECONOMICS AND FARM MANAGEMENT PRACTICAL

Computation of depreciation cost of farm assets. Determination of most profitable level ofinputs useinafarmproductionprocess.Applicationofequi-marginalreturns/opportunitycostprinciple in allocation of farm resources. Determination of least cost combination of inputs. Selection of most profitable enterprise combination. Farm holding survey. Application of cost principles including CACP concepts in the estimation of cost of crop and livestock enterprises. Farm business analysis, Preparation of farm plan and budget, farm records and accounts and profit & loss accounts. Collection and analysis of data on various resources in India. Seminar on selected topics.

B. Vocational course
AGRICULTURE
2020-21 Admitted Batch
II Year Semester – IV
INTRODUCTION TO PRODUCTION ECONOMICS AND FARM MANAGEMENT
MODEL QUESTION PAPER

Time:3Hours Maximum: 75Marks

SECTION – A

Answer any **FIVE** questions. Each question carries equal marks. (5*5 = 25)

1. Define farm management? Explain it's scope.
2. What is farm plan? What are the key features of good farm plan.
3. Write down the advantages and disadvantages of diversified farming.
4. Differentiate between farm budgeting and linear programming.
5. What is production economics and list out it's objectives.
6. Differentiate law of variable proportions and returns to scale.
7. What is isoquant? List out it's characteristics.
8. What are the basic production problems?

SECTION – B

Answer **All** the questions. Each question carries**TEN**marks (5*10 =50)

1. a) List out the economic principles applied in farm management. Explain in detail law of variable proportions.

   (OR)

   b) Elaborate systems of farming in detail
2. a) Explain law of returns with the help of graphs and tables.

   (OR)

   b) i) What is risk and uncertainty. Explain the sources of risk and uncertainty.
   ii) What are methods reducing the risk and uncertainty.
3. a) Explain the key features of three stages of production function.

   (OR)

   b) Explain the least cost combination of inputs by graphical, algebraic and arithmetic methods.
4. a) Explain and draw different types of product-product relationships.

   (OR)

   b) What is farm planning and budgeting. Explain the basic steps in farm planning and budgeting.
5. a) i) Production possibility curve
   ii) Ridge lines

   (OR)

   b) Determine optimum combination of products in algebraic, graphic and tabular methods.

ANDHRA UNIVERSITY
B. VOCATIONAL COURSE
AGRICULTURE
2020-21 Admitted Batch
II Year Semester- IV
HORTICULTURE
(CREDITS 4+2=6)

UNIT-I

1. Horticulture – Definition - Divisions of horticulture with suitableexamples.
2. Scope and importance of horticulture - Importance of horticulture in terms of income, employment generation, industry, religious, aesthetic, food & nutritive value andexport.
3. Horticulturalclassificationbasedonsoil,climateandbotanicalclassification.
4. Climateandsoilforhorticulturalcrops-Influenceofenvironmentalfactorsonhorticultural crop production – Temperature, humidity, wind, rainfall and solar radiation – Influence of soil factors – Soiltype, pH, EC.

UNIT-II

5. Propagating structures- Plant propagation- Methods - Sexual and asexual – Propagation by cuttings – Definition of cutting – Stem cuttings – Leaf cuttings – Root cuttings.
6. Propagation by Layering - Types of layering (tip, simple, compound, mound, trench, air layering) - Natural modifications of layering (runners, suckers, stolon, offset)- Propagation by separation - Bulbs, corms; division (rhizome, stem tuber, tuberousroots).
7. Grafting, budding -Rootstock and scion selection – Grafting methods – Attached scion methods of grafting, simple or approach grafting, detached scionmethods ofgrafting(sidegrafting-Veneergrafting,apicalgrafting-epicotylgrafting,double,soft wood grafting, cleft grafting, tongue grafting, whip grafting) - Graft incompatibility – Types – Translocated and localized incompatibility; Budding – Methods of budding – T-budding, inverted T-budding, patch budding and ringbudding - Top working.

UNIT-III

8. Principles of orchard establishment – Points to be kept in mind while selecting site for the establishment of orchards - Principles and steps in orchard establishment - Layoutoforchards–Systemsofplanting-Square,rectangle,quincunx,hexagonaland contour systems of planting-their merits anddemerits.
9. Principles and methods of training and pruning - Definition of training, objectives and training,principlesandmethodsoftrainingoffruitcrops-Opencentre,closedcentreand modified leader systems their merits and demerits - Definition of pruning, objectives of pruning, principles and methods of pruning of fruitcrops.
10. Juvenility and flower bud differentiation – Methods for shortening juvenility - Application of growth regulators (Gibberellins, Auxins, cytokinins, Abscissic acid, Ethylene), environmental methods (photoperiod, temperature) - Cultivation techniques (grafting, pruning, girdling, irrigation, nutrition) - Bearing habits of fruittrees.

UNIT-IV

11. Unfruitfulness, factors (physiological, phylogenical, management, parasitical, climatological) pollination - Self and Cross pollination, pollinizers and pollinators Fertilization and parthenocarpy –Types.
12. Types of vegetables Gardens – Kitchen Garden, market garden, truck garden, vegetable forcing, garden for processing, seed production garden and floating garden. Ornamental gardentypes–Formal–Informal –WildGarden–Parts/featuresofanornamental garden.
13. Lawn making – Selection of Grass – Bermuda grass – Korean grass – Poa grass – Fescue grass–Kentuckybluegrass-Grassesforshadyareas–SiteSelection–Soil Preparation of soil – Drainage – Digging – Manuring and grading – Methods of planting – Sowing of seeds – Dibbling – Turfing – Maintenance of lawn – Mowing – Rolling – Sweeping –Scraping – Raking – Weeding – Irrigation – Top dressing with compostandfertilizers-Diseasesandotherproblems–Fairyring–PaleYellowLaws.

UNIT-V

14. Use of plant bio-regulators (PBR) in horticulture – Introduction – Applications of PBR in fruitcrops.
15. Irrigation methods in horticulture crops - Different methods followed in horticultural crops (check basin, furrow, ring basin, basin, flood, pitcher, funnel, drip andsprinkler).
16. Fertilizer application- Different methods of application to horticultural crops- Broad casting, top dressing, localized placement, contact placement Band placement, row placement, pellet, foliar application, starter solution,fertigation.

HORTICULTURE (PRACTICAL)

1. Identification of gardentools.
2. Identification of horticulturalcrops.
3. Layout of different plantingsystems.
4. Layout of kitchengarden.
5. Preparationofnurserybed(raisedandflatbeds)andsowingofseeds.
6. Practice of different asexual methods bydivisions.
7. Practice of different asexual methods by cuttings.
8. Practice of different asexual methods by grafting.
9. Practice of different asexual methods bybudding.
10. Practice of different asexual methods bylayering.
11. Training and pruning of fruittrees.
12. Transplanting and care of vegetableseedlings.
13. Making of herbaceous and shrubberyborders.
14. Preparation of potting mixture, potting andrepotting.
15. Fertilizer application in differentcrops.
16. Visits to commercial nurseries/orchard.

References

1. Chadha,K.L.2001.*HandbookofHorticulture.*ICAR,NewDelhi.
2. Jitendra Singh,2012. *Basic Horticulture.* Kalyani Publishers. New Delhi.
3. Randhawa, G.S. and Mukhopadhyaya, A. 1994. *Floriculture in India*. Allied Publishers Pvt. Ltd., NewDelhi
4. Kumar, N. 1997. *Introduction to Horticulture*. Rajyalakshmi Publications,Nagorcoil, Tamilnadu.

ANDHRA UNIVERSITY
B. VOCATIONAL COURSE
AGRICULTURE
2020-21 Admitted Batch
II Year Semester- IV
HORTICULTURE
MODEL QUESTION PAPER
SECTION – A

Time:3Hours Maximum: 75Marks

Answer any FIVE questions. Each question carries equal marks. (5*5=25)

1. Write about the influence of Humidity and Rainfall on Horticulture crops.
2. Write about the advantages of Seed Propagation.
3. What are the types of propagation by Separation?
4. Write about T or Shield budding.
5. What are the responses of plants to pruning?
6. What are the cultural causes for unfruitfulness in fruit trees?
7. What is parthenocarpy and write about its types.
8. Write briefly about the maintenance of lawn.

SECTION-B

Answer all the questions. Each question carries TEN marks. (5*10=50)

1. a) Write about divisions of Horticulture with examples.

(OR)

b) What are the criteria for the selection of a site for orchard establishment?

2. a) Explain about different systems of planting in Horticultural crops.

(OR)

b) Explain different types of Layerings in Plant propagation.

3. a) Write about the systems of Training in Fruit crops with merits and demerits.

(OR)

b) Write about the Practical applications of Plant growth regulators in Horticulture crops.

4. a) Write briefly about the types of Vegetable gardens.

(OR)

b) Mention various methods of Irrigation of Horticultural crops and explain about Drip and sprinkler Methods.

5. a) Write about the importance of Horticulture crops in National economy.

(OR)

b) Write about different methods of fertilizer application in Horticultural crops.