

ANDHRA UNIVERSITY

Telegrams: UNIVERSITY
Telephone: 284 4000
Fax: 0891 - 2755324



All Official letters, packages
etc, should be addressed to
the Registrar by designation
and not by name

No. LI(1)/U.G. Courses/B. Vocational Agriculture Course/CBCS Syllabus / 2020-21.

Visakhapatnam,
Dt: 31-07-2021.

From: THE REGISTRAR

To

The Principal,
A.M.A.L. College,
Anakapalle.

Sir/Madam,

Sub: Choice Based Credit System (CBCS) Syllabus of (w.e.f. 2020-21)
U.G. Courses – Orders – Issued.

Read: Letter dated: 27-07-2021 received from Principal, A.M.A.L.
College, Anakapalle, enclosed syllabus of B. Vocational
Agriculture Course along with minutes of the meeting of
the Board of Studies.

* * *

I am by direction to inform that all the Principals of the affiliated colleges to strictly adhere to the APSCHE guidelines for the revised Choice Based Credit System, syllabus of U.G. Courses B. Vocational Agriculture course (CBCS) placed in A.U. website w.e.f 2020-21.

Thanking you,

Yours faithfully,

(B.RAMACHANDER)
ASSISTANT REGISTRAR (ACADEMIC)

Copies to:

1. The Dean of Academic Affairs, A.U., VSP.
2. The Dean, U.G. & P.G, Professional Courses, A.U., Vsp.
3. The Dean, CDC, A.U., Vsp.
4. The Dean, Confidential, A.U., Vsp.
5. The Controller of Examinations, A.U., Vsp.
6. The Principal, A.M.A.L. College, Anakapalle.
7. The Secretary to V.C., Rector Table, P.A. to Registrar, A.U., Vsp.
8. The Director, Computer Centre, A.U., Vsp.
9. The Secretary to APSCHE.
10. The Chairman, Agriculture Council, A.P.
11. The Registrar, Veterinary Council. A.P.
12. The Secretary to ICAR.
13. O.C. & O.O.F.

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Visakhapatnam,
Dt: 31-07-2021.

PROCEEDINGS OF THE VICE-CHANCELLOR

Sub: Choice Based Credit System (CBCS) Syllabus of (w.e.f. 2020-21)
U.G. Courses – Orders – Issued.

Read: Letter dated: 27-07-2021 received from Principal, A.M.A.L.
College, Anakapalle, enclosed syllabus of B. Vocational
Agriculture Course along with minutes of the meeting of
the Board of Studies.

* * *

ORDER:

The Hon'ble Vice-Chancellor has ordered that the ref read above on the revised Choice Based Credit System (CBCS) syllabus of B. Vocational Agriculture course be approved (w.e.f. 2020-21) and be placed in A.U. website.

It is further ordered to place the matter before the ensuing meeting of the Academic Senate for ratification.

(BY ORDER)

(B. RAMACHANDER)
ASSISTANT REGISTRAR (ACADEMIC)

To:
The Dean, Academic Affairs, A.U. Vsp.

Copies to:

1. The Dean of Academic Affairs, A.U., VSP.
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11. The Registrar, Veterinary Council. A.P.
12. The Secretary, ICAR.
13. O.C. & O.O.F.

**ANDHRA UNIVERSITY
VISAKHAPATNAM**

**SYLLABUS OF
B. Vocational Course**

AGRICULTURE

**UGC- NATIONAL SKILLS
QUALIFICATIONS
FRAMEWORK**

2020-21

ADMITTED BATCH

1 ST YEAR	I SEM	1.	English (language)	3+0=3
		2.	Telugu (language)	3+0=3
		3.	Human Values and Professional Ethics (Skill development)	2+0=2
		4.	Plant Nursery (Skill development)	2+0=2
		5.	Introduction to Agronomy (Core subject)	4+2=6
		6.	Introduction to Soil science (Core subject)	4+2=6
		7.	Fundamentals of Genetics (Core subject)	4+2=6
		Credits=22+6= 28		
	II SEM	1.	English (language)	3+0=3
		2.	Inorganic Chemistry (General education)	3+0=3
		3.	Information & Communication Technology (Skill development)	2+0=2
		4.	Fruits and Vegetables Preservation (Skill development)	2+0=2
		5.	Agriculture Marketing (Skill development)	2+0=2
		6.	Introduction to Entomology (Core subject)	4+2=6
		7.	Introduction to Plant Pathology (Core subject)	4+2=6
		8.	Introduction to Plant Breeding (Core subject)	4+2=6
Credits=24+6=30				
2 ND YEAR	III SEM	1.	English (Language)	3+0=3
		2.	Organic Chemistry (General education)	3+0=3
		3.	Health &Hygiene (Skill development)	2+0=2
		4.	Environmental Education (Skill development)	2+0=2
		5.	Disaster Management Skill development)	2+0=2
		6.	Agronomy of Field Crops (Core subject)	4+2=6
		7.	Pests of Field Crops & their Management (Core subject)	4+2=6
		8.	Manures, Fertilizers & Soil Fertility Management (Core subject)	4+2=6
	Credits24+6=30			
	IV SEM	1.	Physical Chemistry (General education)	3+0=3
		2.	Principles of Organic Farming (Core subject)	4+2=6
		3.	Weed & Water Management (Core subject)	4+2=6
		4.	Fungicides & Plant disease Management (Core subject)	4+2=6
		5.	Farm power & Machinery (Core subject)	4+2=6
		6.	Rain fed Agriculture & Water shed Management (Core subject)	4+2=6
	Credits 23+10=33			
3 RD YEAR	V SEM	1.	Environmental Chemistry (General education)	3+0=3
		2.	Fundamentals of Crop Physiology (Core subject)	4+2=6
		3.	Principles of Seed Technology (Core subject)	4+2=6
		4.	Horticulture (Core subject)	4+2=6
		5.	Introduction to Agricultural Economics and Farm Managemer (Core subject)	4+2=6
		6.	Project work (Field work)	0+4=4
	Credits 19+12=31			
	VI SEM	1.	Production Technology for Vegetables & Spices (Core subject)	4+2=6
		2.	Pests of Horticultural Crops & Productive Entomology (Core subject)	4+2=6
		3.	Breeding of Field Crops (Core subject)	4+2=6
		4.	Production Technology of Ornamental Crops, Medicinal & Aromatic Plants (Core subject)	4+2=6
		5.	Project Work (Field work)	0+4=4
	Credits 16+12=28			
	TOTAL CREDITS 128+52= 180			

CURRICULAR FRAME WORK

B.Vocational course

AGRICULTURE

2020-21 ADMITTED BATCH

Subjects	Semes ter I	Semes ter II	Semes ter III	Semes ter IV	Semes ter V	Semes ter VI	Total Credits
English	3+0=3	3+0=3	3+0=3				9+0=9
Telugu	3+0=3						3+0=3
Organic chemistry			3+0=3				3+0=3
Inorganic chemistry		3+0=3					3+0=3
Physical chemistry				3+0=3			3+0=3
Environment al chemistry					3+0=3		3+0=3
Life skills-1	2+0=2	2+0=2	2+0=2				6+0=6
Life skills-2			2+0=2				2+0=2
Skill developm ent-1	2+0=2	2+0=2	2+0=2				6+0=6
Skill developm ent-2		2+0=2					2+0=2
Core subject-1	4+2=6	4+2=6	4+2=6		4+2=6	4+2=6	20+10=30
Core subject-2	4+2=6	4+2=6	4+2=6	4+2=6	4+2=6	4+2=6	24+12=36
Core subject-3	4+2=6	4+2=6	4+2=6	4+2=6	4+2=6	4+2=6	24+12=36
Core subject-4				4+2=6	4+2=6	4+2=6	12+6=18
Core subject-5				4+2=6			4+2=6
Core subject-6				4+2=6			4+2=6
Project work (Field work)					0+4=4	0+4=4	0+8=8
Total Credits	22+6= 28	24+6= 30	24+6= 30	23+10 =33	19+12 =31	16+12= 28	128+52= 180

1 ST YEAR	I SEM	1.	English (language)	3+0=3
		2.	Telugu (language)	3+0=3
		3.	Human Values and Professional Ethics (Skill development)	2+0=2
		4.	Plant Nursery (Skill development)	2+0=2
		5.	Introduction to Agronomy (Core subject)	4+2=6
		6.	Introduction to Soil science (Core subject)	4+2=6
		7.	Fundamentals of Genetics (Core subject)	4+2=6
Total Credits= 22+6=28				

ANDHRA UNIVERSITY
B. Vocational course
AGRICULTURE
2020-21 Admitted Batch
I Year – Semester I
English - 1
(CREDITS 3+0=3)

Learning outcome:

- ★ Use grammar effectively in writing and speaking.
- ★ Demonstrate the use of good vocabulary
- ★ Demonstrate an understating of writing skills
- ★ Acquire ability to use Soft Skills in professional and daily life.
- ★ Confidently use the tools of communication skills

UNIT-I- Listening Skills- Importance of Listening, Types of Listening, Barriers to Listening
Effective Listening

UNIT-II- Speaking Skills- Sounds of English: Vowels and Consonants, Word Accent, **Intonation**

UNIT-III- Grammar-Concord, Modals, Tenses (Present/Past/Future), Articles, Prepositions, Question Tags, Sentence Transformation (Voice, Reported Speech & Degrees of Comparison), Error Correction

UNIT-IV- Writing- Punctuation, Spelling, Paragraph Writing

UNIT-V- Soft Skills- SWOC, Attitude, Emotional Intelligence, Telephone Etiquette, Interpersonal Skills

ANDHRA UNIVERSITY
B. Vocational course
AGRICULTURE
2020-21 Admitted Batch
I Year – Semester I
ENGLISH - 1
MODEL QUESTION PAPER

Max. Marks: 50

Time: 1½ hrs (90 Minutes)

SECTION- A

(4x5M=20 Marks)

Answer any four questions. Each answer carries 5 marks
(At least 1 question should be given from each Unit)

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.

SECTION-B

(3x10M = 30 Marks)

Answer any three questions. Each answer carries 10 marks

(At least 1 question should be given from each Unit)

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

ANDHRA UNIVERSITY

B. Vocational course

AGRICULTURE

2020-21 Admitted Batch

I Year – Semester I

TELUGU

(CREDITS 3+0=3)

అంశం: జనరల్ తెలుగు

సెమిస్టర్-1

కోర్సు-1 : ప్రాచీన తెలుగు కవిత్వం

యూనిట్ల సంఖ్య: 5

పీరియడ్ల సంఖ్య: 60

✦ అభ్యసన ఫలితాలు:-

ఈ కోర్సు విజయవంతంగా ముగించాక, విద్యార్థులు క్రింది అభ్యసన ఫలితాలను పొందగలరు.

1. ప్రాచీన తెలుగుసాహిత్యం యొక్క ప్రాచీనతను, విశిష్టతను గుర్తిస్తారు. తెలుగుసాహిత్యంలో ఆదికవి నన్నయ కాలంనాటి భాషాసంస్కృతులను, ఇతిహాసకాలం నాటి రాజనీతి విషయాలపట్ల పరిజ్ఞానాన్ని సంపాదించగలరు.
2. శివకవుల కాలంనాటి మతపరిస్థితులను, భాషావిశేషాలను గ్రహిస్తారు. తెలుగు నుడికారం, సామెతలు, లోకోక్తులు మొదలైన భాషాంశాల పట్ల పరిజ్ఞానాన్ని పొందగలరు.
3. తిక్కన భారతంనాటి మత, ధార్మిక పరిస్థితులను, తిక్కన కవితాశిల్పాన్ని, నాటకీయతను అవగాహన చేసుకోగలరు.
4. ఎఱ్ఱన సూక్తివైచిత్రిని, ఇతిహాస కవిత్వంలోని విభిన్న రీతులపట్ల అభిరుచిని పొందగలరు. శ్రీనాథుని కాలం నాటి కవితావిశేషాలను, మొల్ల కవితా విశిష్టతను గుర్తించగలరు.
5. తెలుగు పద్యం స్వరూప-స్వభావాలను, సాహిత్యాభిరుచిని పెంపొందించుకుంటారు. ప్రాచీన కావ్యభాషలోని వ్యాకరణాంశాలను అధ్యయనం చేయడం ద్వారా భాషాసామర్థ్యాన్ని, రచనల మేళకువలను గ్రహించగలరు.

పాఠ్య ప్రణాళిక

యూనిట్-I

రాజనీతి

- సన్నయ

మహాభారతం-సభాపర్వం-ప్రథమాశ్వాసం-(26-57 పద్యాలు)

యూనిట్-II

దక్షయజ్ఞం

- సన్నెచోడుడు

కుమారసంభవం-ద్వితీయాశ్వాసం-(49-86 పద్యాలు)

యూనిట్-III

ధౌమ్య ధర్మోపదేశము

- తిక్కన

మహాభారతం-విరాటపర్వం-ప్రథమాశ్వాసం-(116-146) పద్యాలు

యూనిట్-IV

పలనాటి బెబ్బలి

- శ్రీనాథుడు (పలనాటి వీరచరిత్ర-ద్విపద కావ్యం పుట 108-112

‘బాలచంద్రుడు భీమంబగు సంగ్రామం జొనర్చుట.. (108)..

..... వెఱగంది కుంది’ (112) సం. అక్కిరాజు ఉమాకాంతం

ముద్రణ.వి.కె.స్వామి, బెజవాడ 1911.

యూనిట్-V

సీతారావణ సంవాదం

- మొల్ల

రామాయణము-సుందరకాండము-(40-87 పద్యాలు)

♦వ్యాకరణం

సంధులు: ఉత్ప, త్రిక, ద్రుతప్రకృతిక, నుగాగమ,ద్విరుక్తటకారాదేశ, యణాదేశ, వృద్ధి, శ్చుత్వ,

జశ్చ, అనునాసిక సంధులు.

సమాసాలు: అవ్యయిభావ, తత్పురుష, కర్మధారయ, ద్వంద్వ, ద్విగు, బహువ్రీహి.

అలంకారాలు:

అర్థాలంకారాలు : ఉపమ, ఉత్పేక్ష, రూపక, స్వభావోక్తి, అర్థాంతరవ్యాస, అతిశయోక్తి.

శబ్దాలంకారాలు : అనుప్రాస (వృత్త్యనుప్రాస, ఛేకామప్రాస లాటానుప్రాస, అంత్యానుప్రాస)

ఛందస్సు

వృత్తాలు: ఉత్పలమాల, చంపకమాల, శార్దూలము, మత్తేభము;

జాతులు : కందం, ద్విపద; ఉపజాతులు : ఆటవెలది, తేటగీతి, సీసం మరియు ముత్యాలసరాలు

ఆధార గ్రంథాలు:

1. శ్రీమదాంధ్ర మహాభారతము : సభాపర్వము-తిరుమల తిరుపతి దేవస్థానం ప్రచురణ
2. శ్రీమదాంధ్ర మహాభారతము : విరాటపర్వము-తిరుమల తిరుపతి దేవస్థానం ప్రచురణ
3. కుమార సంభవం - నన్నెచోడుడు
4. పలనాటి వీరచరిత్ర - శ్రీనాథుడు
5. రామాయణము - మొల్ల

♦ సూచించబడిన సహపాఠ్య కార్యక్రమాలు:

1. నన్నయ్య, తిక్కన, ఎఱ్ఱన మొదలైన ప్రసిద్ధ కవుల పాఠ్యాంశేతర పద్యాలను ఇచ్చి, విద్యార్థులచేత సమీక్షలు రాయించడం; ఆయా పద్యాల్లోని యతిప్రాసాది ఛందోవిశేషాలను గుర్తింపజేయడం.
2. విద్యార్థులచేత పాఠ్యాంశాలకు సంబంధించిన వ్యాసాలు రాయించడం (సెమినార్/అపైన్ మెంట్)
3. ప్రాచీన పాఠ్యాంశాలలోని సమకాలీనతను గూర్చిన బృంద చర్చ, ప్రాచీన సాహిత్యాన్ని నేటి సామాజిక దృష్టితో పునర్మూల్యాంకనం చేయించడం.
4. చారిత్రిక, సాంస్కృతిక అంశాలకు సంబంధించిన పర్యాటక ప్రదేశాలను సందర్శించడం.
5. వ్యక్తిగత/బృంద ప్రాజెక్టులు చేయించడం. ప్రశ్నాపత్ర నిర్మాతలకు సూచనలు ప్రతిపదార్థ పద్యాలు, కంఠస్థ పద్యాలు “రాజనీతి, దక్షయజ్ఞం, ధౌమ్య ధర్మోపదేశం, సీతారావణ సంవాదం” అనే నాలుగు పాఠ్యాంశాల నుండి మాత్రమే ఇవ్వాలి.

ప్రశ్నాపత్ర నమూనా

అ. ప్రతిపదార్థ పద్యాలు-(అంతర్గత ఛాయీస్) (2-1)	1×8=8 మా
ఆ. కంఠస్థ పద్యం-(అంతర్గత ఛాయీస్) (2-1)	1×3=3 మా
ఇ. సందర్భ వాక్యాలు-	(6-4) 4×3=12 మా
ఈ. సంగ్రహ సమాధాన ప్రశ్నలు (6-4)	4×3=12 మా
ఉ. వ్యాస ప్రశ్నలు (అంతర్గత ఛాయీస్) (6-3)	3×8=24 మా
ఊ. వ్యాకరణం-సంధులు (6-4)	4×1=4 మా
సమాసాలు (6-4)	4×1=4 మా
అలంకారాలు (2-1)	1×4=4 మా
ఛందస్సు (2-1)	1×4=4 మా

ANDHRA UNIVERSITY
B. Vocational course
AGRICULTURE
2020-21 Admitted Batch
I Year – Semester I
HUMAN VALUES AND PROFESSIONAL ETHICS
(CREDITS 2+0=2)

Learning Outcome:

On completion of this course, the UG students will be able to

- ★ Understand the significance of value inputs in a classroom and start applying them in their life and profession
- ★ Distinguish between values and skills, happiness and accumulation of physical facilities, the Self and the Body, Intention and Competence of an individual, etc.
- ★ Understand the value of harmonious relationship based on trust and respect in their life and profession
- ★ Understand the role of a human being in ensuring harmony in society and nature.
- ★ Distinguish between ethical and unethical practices, and start working out the strategy to actualize a harmonious environment wherever they work.

UNIT-I

Introduction – Definition, Importance, Process & Classifications of Value Education.

Understanding the need, basic guidelines, content and process for Value Education

Understanding the thought provoking issues; need for Values in our daily life

Choices making – Choosing, Cherishing & Acting

Classification of Value Education: understanding Personal Values, Social Values, Moral Values & Spiritual Values.

UNIT-II

Harmony in the Family – Understanding Values in Human Relationships

Understanding harmony in the Family- the basic unit of human interaction

Understanding the set of proposals to verify the Harmony in the Family;

Trust (*Vishwas*) and Respect (*Samman*) as the foundational values of relationship

Present Scenario: Differentiation (Disrespect) in relationships on the basis of body, physical facilities, or beliefs.

Understanding the Problems faced due to differentiation in Relationships

Understanding the harmony in the society (society being an extension of family): *Samadhan*, *Samridhi*, *Abhay*, *Sah-astitvaas* comprehensive Human Goals

Visualizing a universal harmonious order in society- Undivided Society (*AkhandSamaj*), Universal Order (*SarvabhaumVyawastha*)- from family to world family.

UNIT-III

Professional Ethics in Education

Understanding about Professional Integrity, Respect & Equality, Privacy, Building Trusting Relationships.

Understanding the concepts; Positive co-operation, Respecting the competence of other professions.

Understanding about Taking initiative and Promoting the culture of openness.

Depicting Loyalty towards Goals and objectives.

Text Books:

- ★ R R Gaur, R Sangal, G P Bagaria, 2009, A Foundation Course in Human Values and Professional Ethics.
- ★ Bhatia, R. & Bhatia, A (2015) Role of Ethical Values in Indian Higher Education.

References:

1. Ivan Illich, 1974, Energy & Equity, The Trinity Press, Worcester, and Harper Collins,
2. U E.F. Schumacher, 1973, Small is Beautiful: a study of economics as if people mattered, Blond & Briggs, Britain.
3. Susan George, 1976, How the Other Half Dies, Penguin Press. Reprinted 1986, 1991
4. Donella H. Meadows, Dennis L. Meadows, Jorgen Randers, William W. Behrens III, 1972, Limits to Growth – Club of Rome's report, Universe Books.
5. A Nagraj, 1998, Jeevan Vidya EkParichay, Divya Path Sansthan, Amarkantak.
6. P L Dhar, RR Gaur, 1990, Science and Humanism, Commonwealth Publishers.
7. A N Tripathy, 2003, Human Values, New Age International Publishers.

Mode of Evaluation:

Assignment/ Seminar/Continuous Assessment Test/Semester End Exam.

Co-curricular Activities:

1. Visit to an Old Age Home and spending with the inmates for a day.
2. Conduct of Group Discussions on the topics related to the syllabus.
3. Participation in community service activities.
4. Working with a NGO like Rotary Club or Lions International, etc.

ANDHRA UNIVERSITY
B. Vocational course
AGRICULTURE
2020-21 Admitted Batch
I Year – Semester I
HUMAN VALUES AND PROFESSIONAL ETHICS
MODEL QUESTION PAPER

Max. Marks: 50

Time: 1½ hrs (90 Minutes)

SECTION- A

(4x5M=20 Marks)

Answer any four questions. Each answer carries 5 marks
(At least 1 question should be given from each Unit)

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.

SECTION-B

(3x10M = 30 Marks)

Answer any three questions. Each answer carries 10 marks

(At least 1 question should be given from each Unit)

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

ANDHRA UNIVERSITY
B. Vocational course
AGRICULTURE
2020-21 Admitted Batch
I Year – Semester I
PLANT NURSERY
(CREDITS 2+0=2)

Learning Outcomes :

On successful completion of this course students will be able to;

- ★ Understand the importance of a plant nursery and basic infrastructure to establish it.
- ★ Explain the basic material, tools and techniques required for nursery.
- ★ Demonstrate expertise related to various practices in a nursery.
- ★ Comprehend knowledge and skills to get an employment or to become an entrepreneur in plant nursery sector.

UNIT-I

Introduction to plant nursery

Plant nursery: Definition, importance.

Different types of nurseries –on the basis of duration, plants produced, structure used.

Basic facilities for a nursery; layout and components of a good nursery.

Plant propagation structures in brief.

Bureau of Indian Standards (BIS-2008) related to nursery.

UNIT- II

Necessities for nursery

Nursery beds – types and precautions to be taken during preparation.

Growing media, nursery tools and implements, and containers for plant nursery, inbrief.

Seeds and other vegetative material used to raise nursery.in brief.

Outlines of vegetative propagation techniques to produce planting material.

Sowing methods of seeds and planting material.

UNIT-III

Management of nursery

Seasonal activities and routine operations in a nursery.

Nursery management – watering, weeding and nutrients; pests and diseases.

Common possible errors in nursery activities.

Economics of nursery development, pricing and record maintenance.

Online nursery information and sales systems.

Suggested Co-curricular activities

- ★ Assignments/Group discussion/Quiz/Model Exam.
- ★ Demonstration of nursery bed making.
- ★ Demonstration of preparation of media for nursery.
- ★ Hands on training on vegetative propagation techniques.
- ★ Hands on training on sowing methods of seeds and other material.
- ★ Invited lecture cum demonstration by local expert.
- ★ Watching videos on routine practices in plant nurseries.
- ★ Visit to an agriculture/horticulture /forest nursery.
- ★ Case study on establishment and success of a plant nursery.

Suggested text books/reference books :

- ★ Ratha Krishnan, M., et.al. (2014) Plant nursery management : Principles and practices, Central Arid Zone Research Institute (ICAR), Jodhpur, Rajasthan
- ★ Kumar, N., (1997) Introduction to Horticulture, Rajalakshmi Publications, Nagercoil.
- ★ KumarMishra, K., N.K. Mishra and Satish Chand (1994) Plant Propagation, John Wiley & Sons, New Jersey.

ANDHRA UNIVERSITY
B. Vocational course
AGRICULTURE
2020-21 Admitted Batch
I Year – Semester I
PLANT NURSERY
MODEL QUESTION PAPER

Max. Marks: 50

Time: 1½ hrs (90 Minutes)

SECTION- A

(4x5M=20 Marks)

Answer any four questions. Each answer carries 5 marks
(At least 1 question should be given from each Unit)

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.

SECTION- B

(3x10M = 30 Marks)

Answer any three questions. Each answer carries 10 marks(At
least 1 question should be given from each Unit)

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

ANDHRA UNIVERSITY
B. Vocational course
AGRICULTURE
2020-21 Admitted Batch
I Year Semester – I
INTRODUCTION TO AGRONOMY
(CREDITS 4+2=6)

UNIT- I- Importance and scope Agriculture – Definition- Branches of agriculture- History of agricultural development in the World and India.

UNIT – II- Agroclimatic zones- Agronomy - Definition - Importance - Meaning and scope Agro-climatic zones of Andhra Pradesh & India-Crops and their classification- Factors affecting crop production

UNIT – III- Tillage- Types - Objectives - Modern concepts of tillage-Crop establishment methods

UNIT – IV- Manures and fertilizers- Irrigation management -Fertilizer application

UNIT – V- Cropping patterns and cropping systems-Weed management- Sustainable agriculture- Integrated farming systems- Organic agriculture

Reference Books

1. Reddy , S R and Reddi Ramu 5th edition 2016, -kalyani publishers, Ludhiana.

INTRODUCTION TO AGRONOMY (PRACTICAL)

1. Visit to college farm & study of farm features and measurements
2. Identification of crops and seeds
3. Study of seed treatment practices
4. Study of tillage implements- practicing ploughing, puddling operations.
5. Calculation of the seed rate and fertilized requirements.
6. Different methods of seeds sowing and planting.
7. Methods of inter – cultivation implements
8. Fertilizer applications and participation in field operations

ANDHRA UNIVERSITY
B. Vocational course
AGRICULTURE
2020-21 Admitted Batch
I Year Semester – I
INTRODUCTION TO AGRONOMY
MODEL QUESTION PAPER

Maximum: 75 Marks

SECTION – A

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

1. Define Agronomy? Discuss about its scope & importance briefly.
2. Write a note on Agro Climatic Zones of Andhra Pradesh.
3. What do you mean by sustainable Agriculture? Mention the Features of Sustainable Agriculture.
4. Write a note on tillage and list out the importance of tillage.
5. Discuss about zero tillage and Stubble nuclear tillage.
6. Differentiate between manures and fertilizers.
7. What do you mean by Cropping system and Cropping pattern.
8. What is a Crop? Classify the crops.

SECTION – B

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

1. a) Write a detailed note on Integrated Farming System (IFS).

(OR)

- b) Discuss about Organic Farming.

2. a) What do you mean by fertilizers? Write a note on methods of fertilizer application.

(OR)

- b) Future Scope of Organic Agriculture.

3. a) What is a Weed? Describe the methods of Weed control.

(OR)

- b) What do you mean by manures? List out the most Familiar manures.

4. a) Write a detailed note on modern concepts of tillage.

(OR)

- b) Write an essay on Crop establishment methods.

5. a) What is irrigation? List out the methods or types of irrigation.

(OR)

- b) Mention the objectives and importance of tillage.

ANDHRA UNIVERSITY
B. Vocational course
AGRICULTURE
2020-21 Admitted Batch
I Year Semester – I
INTRODUCTION TO SOIL SCIENCE
(CREDITS 4+2=6)

UNIT – I- Introduction

Definition of soil, Soil as a Natural Body

UNIT – II- Soil Components

Soil air, Soil water, Organic and inorganic solids

UNIT – III- Physical Properties:

Soil separates, texture, Aggregation and Structural Characters, Temperature, Colour, Properties of Soil Mixture, Pore Space, Bulk Density, Particle Density, Aeration, Drainage, compaction, Surface area, Soil water relations.

UNIT - IV. Morphology of Colloids & Biological Properties of Soil

Chemistry of clays, Ionic exchange, Acidity, alkalinity, PH, and salinity relations, Liming and Acidification, Soil Organic matter, C:N relations, N Transformations, Soil organisms, Sulphur transformation.

UNIT – V- Genesis and Classification

Profile, Soil forming factors, Soil Survey methods, Soil survey Reports, Soil distribution, Classification of Systems, Drainage, Erosion: Mechanisms and Control.

References

1. Indian Society of Soil Science.2012. Fundamentals of Soil Science. IARI, New Delhi.
2. Yawalkar K.S, Agarwal, T.P and Bokde, S 1995. Manures and Fertilisers. Agril. Publishing House, Nagpur
3. Samuel Tisdale, Nelson Werner L, Beaton James D and Havlin John L. 2005. Soil Fertility and Fertilizers: An Introduction to Nutrient Management, Macmillian Publishing Co., New York.
4. D. K .Das 2014. Introductory Soil Science. Kalyani Publishers, New Delhi

INTRODUCTION TO SOIL SCIENCE (PRACTICAL)

1. Soil sampling procedures for field and horticultural crops
2. Determination of EC.
3. Determination of PH of soil.
4. Land use, texture bulk density, Definition of Soil Physical properties.
5. Determination of N, P and K of the soil
6. Determination of Sulphur.
7. Fertilizer recommendations.
8. Soil health card, parameters, EC, PH and their Importance

ANDHRA UNIVERSITY
B. Vocational course
AGRICULTURE
2020-21 Admitted Batch
I Year Semester – I
INTRODUCTION TO SOIL SCIENCE
MODEL QUESTION PAPER

Time: 3 Hours

Maximum: 75 Marks

SECTION – A

Answer any **FIVE** questions. Each question carries equal marks.

(5*5 = 25)

1. Define Soil? Why it is called OS natural body?
2. Discuss about the profile of the Soil.
3. What do you mean by soil texture and soil structure?
4. Write a note on soil Air and Soil water.
5. What do you mean by soil colour? What was the impact of soil colour on crop growth.
6. Define Soil Science and mention the importance of soil science knowledge.
7. What is Soil survey and dismiss about soil survey reports.
8. Write a note on classification of soil.

SECTION – B

Answer **All** the questions. Each question carries **TEN** marks

(5*10 = 50)

1. a) What do you mean the seep out of top soil? What were types of it.
(OR)
- b) What is drainage? Write its types.
2. a) Write a detailed note on soil relations.
(OR)
- b) What is ion? What do you mean by ionic exchanger? Discuss about cat ion exchange capacity.
3. a) Write an essay on soil organic matter? Its importance for flora & Fauna of soil.
(OR)
- b) Write about the chemistry of soil? Discuss about bulk and practical density.
4. a) Write a note on Porosity of soil.
(OR)
- b) Discuss about nitrogen transformation in detailed manner.
5. a) Scope and importance of soil sciences and how it helps for future agriculture.
(OR)
- b) Write a note on sulphur transformation.

ANDHRA UNIVERSITY
B. Vocational course
AGRICULTURE
2020-21 Admitted Batch
I Year Semester – I
FUNDAMENTALS OF GENETICS
(CREDITS 4+2=6)

UNIT – I

- ★ De-oxyribo Nucleic Acid (DNA) and its structure – Watson and Crick model functions and types of DNA
- ★ Modes of DNA replication – semi-conservative DNA replication – experimental proof; Ribo Nucleic Acid (RNA) – structure, function and types – messenger RNA (mRNA), ribosomal RNA (rRNA) and transfer RNA (tRNA) – differences between DNA and RNA
- ★ Genetic code – properties of genetic code – central dogma – outline of protein synthesis – transcription and translation

UNIT - II

- ★ Gene expression and differential gene activation – Operon concept – Lac Operon
- ★ Meiosis – definition – process – differences between mitosis and meiosis – significance in plant breeding
- ★ Arrangement of genes on chromosomes – linkage – definition – linkage groups
- ★ coupling phase and repulsion phase – types of linkage – distinction between linkage and pleiotropism
- ★ Crossing over – mechanism of crossing over – types of crossing over – factors effecting crossing over – crossing over at four strand stage – cytological proof of crossing over in *Drosophila* – significance of crossing over in plant breeding – coincidence – interference

UNIT - III

- ★ Mendel's Laws – Law of segregation – Law of independent assortment – Principle of dominance – Principle of unit characters – exceptions to Mendel's Laws
- ★ Monohybrid and dihybrid ratios – modifications of F₂ ratio in monohybrid and dihybrid crosses and lethal factors
- ★ Gene action – types of gene action – pleiotropism – alleles – characteristic features of alleles – multiple alleles (blood groups in human beings, fur / coat colour in rabbits and self-incompatibility alleles in plants) – characteristic features of multiple alleles – pseudo-alleles – penetrance (complete penetrance and incomplete penetrance) and expressivity (uniform expressivity and variable expressivity)

UNIT - IV

- ★ Cytoplasmic inheritance – definition – chloroplast inheritance (leaf variegation in *Mirabilis jalapa* and iojap in maize) – mitochondrial inheritance (cytoplasmic male sterility in maize and pokyness in neurospora) – characteristic features
- ★ of cytoplasmic inheritance – differences between chromosomal and extrachromosomal inheritance
- ★ Gene mutations – introduction – definition – brief history – terminology – classification of mutations – characteristic features of mutations – spontaneous mutations and induced mutations
- ★ Gene mutations – artificial induction of mutations – physical and chemical mutagens –

molecular basis of mutations – detection of sex linked lethals in *Drosophila* by CLB technique
– detection of mutations in plants – importance of mutation in plant breeding programmes –
chimeras – xenia and metaxenia

- ★ Structural chromosomal aberrations – breakage-fusion-bridge cycle – deletions (deficiencies), duplications and their significance in plant breeding

UNIT - V

- ★ Numerical chromosomal aberrations – terminology – classification – euploidy and aneuploidy – kinds of polyploids – autopolyploids, allopolyploids and segmental allopolyploids
- ★ Numerical chromosomal aberrations – euploidy – monoploids – haploids – differences between monoploids and haploids – diploidy – polyploidy – origin of polyploidy – induction of polyploidy – triploids – tetraploids – cytological behaviour and their significance in plant breeding
- ★ Numerical chromosomal aberrations – polyploidy and evolution of crop species – wheat, cotton, tobacco, *Triticale*, *Brassica* etc.
- ★ Numerical chromosomal aberrations – aneuploidy – types of aneuploids – monosomics, double monosomics, nullisomics, double nullisomics, trisomics (primary, secondary and tertiary trisomics) and tetrasomics – their cytological behaviour and significance in plant breeding – effects of polyploidy
- ★ Genomic approaches in agriculture – definitions of genomics, structural genomics and functional genomics – Human Genome Project – genome size – brief outline

References

1. Gupta, P.K. 1985. *Cytology, Genetics and Cytogenetics*. Rastogi Publications, Meerut. Gupta, P.K. 2007. *Genetics*. Rastogi Publications, Meerut.
2. Pundhan Singh, 2000. *Elements of Genetics*. Kalyani Publishers, Ludhiana.
3. Singh, B.D. 2007. *Fundamentals of Genetics*. Kalyani Publishers, Ludhiana.
4. Strickberger, M.W. 2004. *Genetics*. Prentice – Hall of India Pvt. Ltd., New Delhi.
5. Verma, P.S. and Agarwal, V.K. 2005. *Cell Biology, Genetics, Molecular Biology, Evolution and Ecology*. S. Chand and Co., New Delhi.

FUNDAMENTALS OF GENETICS (PRACTICAL)

1. Study of microscope.
2. Study of cell structure.
3. Practice on mitotic cell division.
4. Practice on meiotic cell division.
5. Practice on meiotic cell division.
6. Probability and Chi-square test.
7. Monohybrid and its modifications.
8. Dihybrid.

ANDHRA UNIVERSITY
B. Vocational course
AGRICULTURE
2020-21 Admitted Batch
I Year Semester – I
FUNDAMENTALS OF GENETICS
MODEL QUESTION PAPER

Time: 3 Hours

Maximum: 75 Marks

SECTION – A

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

1. What are the characteristics of Mutations.
2. Explain lac operon concept of general regulation with neat labeled diagram.
3. Differentiate between linkage & Crossing over.
4. Explain Mendel's law of heredity with suitable examples.
5. Write the Properties of Genetic code.
6. Write about types of DNA & RNA.
7. Explain the experiment to show cytological proof of crossing over.
8. Explain the different types of structural chromosomal aberration with suitable illustrations.

SECTION – B

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

1. a) Explain Semi Conservative method of replication.
(OR)
b) Explain the experiment for identification of recessive lethal mutations in Drosophila.
2. a) Differentiate between mitosis & meiosis.
(OR)
b) Explain lethal gene action with the help of suitable example.
3. a) Define gene interaction? Explain any two of the gene interactions with help of suitable examples.
(OR)
b) Explain different models of sex determination in plants.
4. a) Explain about the special types of chromosomes.
(OR)
b) Describe the effects of various factors that affect the frequency of recombination.
5. a) Explain the Phenomenon of multiple allele with the help of an appropriate example.
(OR)
b) Write about classification, Characteristics of linkage

	II SEM	1.	English (language)	3+0=3
		2.	Inorganic Chemistry (General education)	3+0=3
		3.	Information & Communication Technology (Skill development)	2+0=2
		4.	Fruits and Vegetables Preservation (Skill development)	2+0=2
		5.	Agriculture Marketing (Skill development)	2+0=2
		6.	Introduction to Entomology (Core subject)	4+2=6
		7.	Introduction to Plant Pathology (Core subject)	4+2=6
		8.	Introduction to Plant Breeding (Core subject)	4+2=6
		Total Credits=24+6=30		

ANDHRA UNIVERSITY
B. Vocational course
AGRICULTURE
2020-21 Admitted Batch
I Year Semester – II
ENGLISH-2
(CREDITS 3+0=3)

Learning Outcomes:

- ★ Use reading skills effectively
- ★ Comprehend different texts
- ★ Interpret different types of texts
- ★ Write well for any purpose
- ★ Improve writing skills independently for future needs

I. UNIT

- Prose** : 1. How to Avoid Foolish Opinions Bertrand Russell
- Skills** : 2. Vocabulary: Conversion of Words
- : 3. One Word Substitutes
- : 4. Collocations

II. UNIT

- Prose** : 1. The Doll's House Katherine Mansfield
- Poetry** : 2. Ode to the West Wind P B Shelley
- Non-Detailed Text** : 3. Florence Nightingale Abrar Mohsin
- Skills** : 4. Skimming and Scanning

III. UNIT

- Prose** : 1. The Night Train at Deoli Ruskin Bond
- Poetry** : 2. Upagupta Rabindranath Tagore
- Skills** : 3. Reading Comprehension
- : 4. Note Making/Taking

IV. UNIT

- Poetry** : 1. Coromandel Fishers Sarojini Naidu
- Skills** : 2. Expansion of Ideas
- : 3. Notices, Agendas and Minutes

V. UNIT

- Non-Detailed Text** : 1. An Astrologer's Day R K Narayan
- Skills** : 2. Curriculum Vitae and Resume
- : 3. Letters
- : 4. E-Correspondence

ANDHRA UNIVERSITY
B. Vocational course
AGRICULTURE
2020-21 Admitted Batch
I Year – Semester II
ENGLISH - 2
MODEL QUESTION PAPER

Max. Marks: 50

Time: 1½ hrs (90 Minutes)

SECTION- A

(4x5M=20 Marks)

Answer any four questions. Each answer carries 5 marks

(At least 1 question should be given from each Unit)

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.

SECTION-B

(3x10M = 30 Marks)

Answer any three questions. Each answer carries 10 marks

(At least 1 question should be given from each Unit)

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

ANDHRA UNIVERSITY
B. Vocational course
AGRICULTURE
2020-21 Admitted Batch
I Year – Semester II
INORGANIC CHEMISTRY
(CREDITS 3+0=3)

UNIT –I

P-BLOCK ELEMENTS

Group-13: Synthesis and structure of diborane and boron- nitrogen compounds ($B_3N_3H_6$ and BN) and Group - 14: Preparation and applications of silanes, silicones and Group - 15: Preparation and reactions of hydrazine, hydroxylamine.

UNIT-II

P-BLOCK ELEMENTS -II

Group - 16: Classifications of oxides based on (i) Chemical behaviour and (ii) Oxygen content, Oxyacids of sulphur (structures only). Group-17: Inter halogen compounds, pseudo halogens and comparison with halogens.

UNIT-III

Organometallic Chemistry

Definition - classification of Organometallic compounds - nomenclature, preparation, properties and applications of alkyls of Li and Mg.

UNIT –IV

1. Chemistry of d-block elements:

Characteristics of d-block elements with special reference to electronic configuration, variable valence, magnetic properties, catalytic properties and ability to form complexes. Stability of various oxidation states.

2. Theories of bonding in metals:

Metallic properties and its limitations, Valence bond theory, Free electron theory, Explanation of thermal and electrical conductivity of metals, limitations, Band theory, formation of bands, explanation of conductors, semiconductors and insulators.

UNIT – V

1. Metal carbonyls: EAN rule, classification of metal carbonyls, structures and shapes of metal carbonyls of V, Cr, Mn, Fe, Co and Ni.

2. Chemistry of f-block elements: Chemistry of lanthanides - electronic structure, oxidation states, lanthanide contraction, consequences of lanthanide contraction, magnetic properties. Chemistry of actinides - electronic configuration, oxidation states, actinide contraction, comparison of lanthanides and actinides.

List of Reference Books

1. Selected topics in inorganic chemistry by W.D.Malik, G..D.Tuli,R.D.Madan
2. Inorganic Chemistry J E Huheey, E A Keiter and R L Keiter
3. Advanced Inorganic chemistry by Gurudeep Raj
4. Basic Inorganic Chemistry by Cotton and Wilkinson
5. Concise Inorganic Chemistry by J.D.Lee

INORGANIC CHEMISTRY (PRACTICAL) QUALITATIVE INORGANIC ANALYSIS

Analysis of mixture salt containing two anions and two cations (From two different groups) from the following:

Anions: Carbonate, sulphate, chloride, bromide, acetate, nitrate, borate, phosphate.

Cations: Lead, copper, iron, aluminium, zinc, manganese, calcium, strontium, barium, potassium and ammonium.

ANDHRA UNIVERSITY
B. Vocational course
AGRICULTURE
2020-21 Admitted Batch
I Year – Semester II
INORGANIC CHEMISTRY
MODEL QUESTION PAPER

Max. Marks: 50

Time: 1½ hrs (90 Minutes)

SECTION- A

(4x5M=20 Marks)

Answer any four questions. Each answer carries 5 marks

(At least 1 question should be given from each Unit)

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.

SECTION B

(3x10M = 30 Marks)

Answer any three questions. Each answer carries 10 marks

(At least 1 question should be given from each Unit)

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

ANDHRA UNIVERSITY
B. Vocational course
AGRICULTURE
2020-21 Admitted Batch
I Year – Semester II
INFORMATION AND COMMUNICATION
TECHNOLOGY
(CREDITS 2+0=2)

Learning outcomes:

- ★ Understand the literature of social networks and their properties.
- ★ Explain which network is suitable for whom.
- ★ Develop skills to use various social networking sites like twitter, flickr, etc.
- ★ Learn few GOI digital initiatives in higher education.
- ★ Apply skills to use online forums, docs, spreadsheets, etc for communication, collaboration and research.
- ★ Get acquainted with internet threats and security mechanisms.

UNIT-I- Fundamentals of Internet: What is Internet?, Internet applications, Internet Addressing – Entering a Web Site Address, URL–Components of URL, Searching the Internet, Browser –Types of Browsers, Introduction to Social Networking: Twitter, Tumblr, LinkedIn, Facebook, flickr, Skype, yahoo, YouTube, WhatsApp .

UNIT-II- E-mail: Definition of E-mail -Advantages and Disadvantages –User Ids, Passwords, Email Addresses, Domain Names, Mailers, Message Components, Message Composition, Mail Management, G-Suite: Google drive, Google documents, Google spread sheets, Google Slides and Google forms.

UNIT-III- Overview of Internet security, E-mail threats and secure E-mail, Viruses and antivirus software, Firewalls, Cryptography, Digital signatures, Copyright issues. What are GOI digital initiatives in higher education? (SWAYAM, Swayam Prabha, National Academic Depository, National Digital Library of India, E-Sodh-Sindhu, Virtual labs, e- acharya, e-Yantra and NPTEL).

RECOMMENDED CO-CURRICULAR ACTIVITIES:

(Co-curricular activities shall not promote copying from textbook or from others work and shall encourage self/independent and group learning)

- ★ Assignments(in writing and doing forms on the aspects of syllabus content and outside the syllabus content. Shall be individual and challenging)
- ★ Student seminars (on topics of the syllabus and related aspects (individual activity)
- ★ Quiz and Group Discussion
- ★ Slip Test
- ★ Try to solve MCQ's available online.
- ★ Suggested student hands on activities :
 - a. Create your accounts for the above social networking sites and explore them, establish a video

conference using Skype.

- b. Create an Email account for yourself- Send an email with two attachments to another friend. Group the email addresses use address folder.
- c. Register for one online course through any of the online learning platforms like NPTEL, SWAYAM, Alison, Codecademy, Coursera. Create a registration form for your college campus placement through Google forms.

Reference:

- 1. In-line/On-line : Fundamentals of the Internet and the World Wide Web, 2/e –by Raymond Greenlaw and Ellen Hepp, Publishers : TMH
- 2. Internet technology and Web design, ISRD group, TMH.
- 3. Information Technology – The breaking wave, Dennis P.Curtin, Kim Foley, Kunai Sen and Cathleen Morin, TMH.

ANDHRA UNIVERSITY
B. Vocational course
AGRICULTURE
2020-21 Admitted Batch
I Year – Semester II
INFORMATION AND COMMUNICATION TECHNOLOGY
MODEL QUESTION PAPER

Time: 1 1/2 hrs (90 Minutes)

Max. Marks: 50

SECTION -A

(Total: 4x5=20 Marks)

(Answer any **four questions**. Each answer carries **5 marks**)

(Total 8 questions. At least 1 question should be given from each Unit)

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.

SECTION- B

(Total: 3x10 = 30 Marks)

(Answer any **three questions**. Each answer carries **10 marks**)

(Total five questions. At least 1 question should be given from each Unit)

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

ANDHRA UNIVERSITY
B. Vocational course
AGRICULTURE
2020-21 Admitted Batch
I Year – Semester II
FRUITS AND VEGETABLES PRESERVATION
(CREDITS 2+0=2)

Learning Outcomes:

On successful completion of this course the students will be able to;

- ★ Identify various types of fruits and vegetables and explain their nutritive value.
- ★ Understand the fragile nature of fruits and vegetables and causes for their damage.
- ★ Explain various methods of preservation for fresh fruits and vegetables.
- ★ Get to know the value-added products made from fruits and vegetables.

UNIT – I- Introduction to fruits and vegetables

1. Fruits: Definition, elementary knowledge on types of fruits (fleshy and dry) with local /common examples.
2. Vegetables: Definition, elementary knowledge on types of vegetables (root, leafy, stem, flower and fruit) with local/ common examples.
3. Importance of fruits and vegetables in human nutrition.
4. Concept of perishable plant products – maturation and spoilage, shelf life; preservation – definition and need for preservation of fruits and vegetables.

UNIT – II- Preservation of Fruit

1. Fruits – ripening and biological aging; storage and preservation concerns.
2. Preservation of fresh fruits at room temperature and in cold storage.
3. Fruit preservation at room temperature as juices, squashes and syrups.
4. Preservation of fruits by application of heat; making of fruit products (jams, jellies and fruit slices in processing factories).
5. Preservation by dehydration (Eg. banana chips), application of sugar (Eg. mango candy), application of salt (pickling).
6. Fruit preservation by freezing – storage at the lowest temperatures.

UNIT – III- Preservation of vegetables

1. Vegetables – losses after harvesting and causes; problems in handling and storage.
2. Modern methods of packaging and storage to reduce losses.
3. Trimming of vegetables and packing in cartons; dehydration technique -factory processing.
4. Making of vegetable products (flakes/chips of potato and onion; garlic powder).
5. Frozen vegetables – Carrots, Cauliflower, Okra and Spinach.
6. Preservation of sliced vegetables in factories by canning and bottling.

Suggested Co-curricular activities

1. Assignments/Group discussion/Quiz/Model Exam.
2. Invited lecture and demonstration by local expert
3. Exhibition of various types of locally available fruits and vegetables.
4. Hands on training on handling and packaging methods of fresh fruits and vegetables.
5. Hands on training on making fruit juices.
6. Display of various preserved fruit products available in local markets.
7. Hands on training on making of potato, yam, onion chips.
8. Display of various preserved vegetable products available in local markets.
9. Watching videos on preservation of fruits and vegetables.
10. Visit to Horticulture University or research station to learn about value added products of fruits and vegetables.

Suggested text books/reference books :

1. Giridharilal, G. S. Siddappa and G.L.Tandon(2007) *Preservation of Fruits andVegetables*, Indian Council of Agri. Res., New Delhi
2. Srivastava, R.P., and Sanjeev Kumar (2019) *Fruit and Vegetable Preservation :Principles and Practices*, CBS Publishers & Distributors Pvt., Ltd., New Delhi
3. Thompson, A.K. (1995) *Post Harvest Technology ofFruits and Vegetables*. BlackwellSci.,U.K.
4. Verma, L.R. and V.K. Joshi (2000) *Post Harvest Technology of Fruits and Vegetables*. Indus Publ., New Delhi

ANDHRA UNIVERSITY
B. Vocational course
AGRICULTURE
2020-21 Admitted Batch
I Year – Semester II
FRUITS AND VEGETABLES PRESERVATION
MODEL QUESTION PAPER

Max. Marks: 50

Time: 1½ hrs (90 Minutes)

SECTION- A

(4x5M=20 Marks)

Answer any four questions. Each answer carries 5 marks

(At least 1 question should be given from each Unit)

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.

SECTION B

(3x10M = 30 Marks)

Answer any three questions. Each answer carries 10 marks(At least 1 question should be given from each Unit)

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

ANDHRA UNIVERSITY
B. Vocational course
AGRICULTURE
2020-21 Admitted Batch
I Year – Semester II
AGRICULTURE MARKETING
(CREDITS 2+0=2)

Learning Outcomes:

By the successful completion of this course, the student will be able to;

- ★ Know the kinds of agricultural products and their movement
- ★ Understand the types, structure and functioning of agricultural marketing system
- ★ Comprehend related skills and apply them in sample situations
- ★ Extend this knowledge and skills to their production/consumption environment

UNIT- I- Introduction of Agriculture and agricultural products (including agriculture, horticulture, sericulture, floriculture, aquaculture- genetic culture and dairy product) - Agricultural Marketing- Role of marketing - Concepts - Goods and services - Movement of product from farm to consumer –Middlemen – Moneylenders - Types of agricultural markets (basic classification).

UNIT- II- Basic structure and facilities of an agricultural market – Primary, secondary and tertiary markets–Functioning of Market Yards–Market information – Rythu Bharosa Kendras (RBK) – Govt market policies and regulations- Contract farming -Govt Apps for marketing of agri products.

UNIT- III- Planning production – assembling – grading - transportation– storage facilities. Price fixation. Dissemination of market information –and role of ICT. Marketing - Mix- Product element- Place element- Price element- Promotion element. Selection of target market. Government programs in support of Agricultural marketing in India.

Suggested Co-curricular Activities

1. Study visit to agricultural markets and Rythu Bharosa Kendras (RBK)
2. Invited lecture by field expert
3. Survey of various involved activities e.g.assembling, grading, storage, transportation and distribution
4. Identify the demand for food processing units
5. Application of Govt Apps as one Nation and one Market
6. Assignments, Group discussion, Quiz etc.

Reference books

- 1.S.S. Acharya & N.L.Agarwala, Agricultural Marketing in India - Oxford and IBH Publications
2. K.S.Habeeb - Ur - Rahman Rural Marketing in India - Himalaya publishing
3. S.S.Chinna Agricultural Marketing in India - KALYANI publishers
4. Publications of National Institute of Agricultural Marketing, Odisha
5. Wikipedia and other websites on Agricultural Marketing.

ANDHRA UNIVERSITY
B. Vocational course
AGRICULTURE
2020-21 Admitted Batch
I Year – Semester II
AGRICULTURE MARKETING
MODEL QUESTION PAPER

Max. Marks: 50

Time: 1 1/2 hrs (90 Minutes)

SECTION A

(Total: 4x5=20 Marks)

Answer any four questions. Each answer carries 5 marks

(At least 1 question should be given from each Unit)

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.

SECTION B

(Total: 3x10 = 30 Marks)

(Answer any three questions. Each answer carries 10 marks)

(At least 1 question should be given from each Unit)

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

ANDHRA UNIVERSITY
B. Vocational course
AGRICULTURE
2020-21 Admitted Batch
I Year – Semester II
INTRODUCTION TO ENTOMOLOGY
(CREDITS 4+2=6)

UNIT I- History and importance

History of Entomology in India; Position of insects in the animal kingdom and their relationship with other classes of Arthropoda; Reasons for insect dominance.

UNIT II- Morphology

General organisation of insect body wall - structure and function, cuticular appendages, moulting; Body regions - insect head, thorax and abdomen, their structure and appendages.

UNIT III- Anatomy and physiology

Digestive, excretory, respiratory, circulatory, nervous and reproductive systems in insects in brief

UNIT IV-Taxonomy of Apterygota and Exopterygota

Insect systematics; Distinguishing characters of agriculturally important orders and families of Hexapoda. Characters of Apterygota, Exopterygota (Ephemeroptera, Odonata, Orthoptera, Phasmida, Dictyoptera, Embioptera, Dermaptera, Hemiptera, Isoptera, Psocoptera, Mallophaga, Thysanoptera and Siphunculata).

UNIT V- Taxonomy of Endopterygota

Distinguishing characters of agriculturally important families of Lepidoptera, Coleoptera, Diptera, Hymenoptera, Siphonaptera, Neuroptera and Strepsiptera.

INTRODUCTION TO ENTOMOLOGY (PRACTICAL)

1. Observations on external features of grasshopper / cockroach,
2. Methods of insect collection, preservation – Preparation of Riker mount.
3. Types of insect head, antenna, mouth parts – Structure of thorax.
4. Types of insect legs, wings and their modifications – wing coupling.
5. Structure of abdomen, and its modifications.
6. Metamorphosis in insects – immature stages in insects.
7. Study of digestive and reproductive systems of grasshopper / cockroach
8. Observing the characters of agriculturally important orders and families.

ANDHRA UNIVERSITY
B. Vocational course
AGRICULTURE
2020-21 Admitted Batch
I Year Semester – II
INTRODUCTION TO ENTOMOLOGY
MODEL QUESTION PAPER

SECTION – A

Answer any **FIVE** questions. Each question carries equal marks.

(5*5 = 25)

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.

SECTION – B

Answer **All** the questions. Each question carries **TEN** marks

(5*10 = 50)

1. a)
- b)
2. a)
- b)
3. a)
- b)
4. a)
- b)
5. a)
- b)

(OR)

(OR)

(OR)

(OR)

(OR)

ANDHRA UNIVERSITY
B. Vocational course
AGRICULTURE
2020-21 Admitted Batch
I Year – Semester II
INTRODUCTION TO PLANT PATHOLOGY
(CREDITS 4+2=6)

UNIT 1: Introduction to plant diseases and their causal organisms

History, Importance of plant diseases, scope and objectives of Plant Pathology. Important plant pathogenic organisms, Classification of Plant Diseases Binomial system of nomenclature, rules of nomenclature

UNIT 2 : Fungi

Fungi: General characters, definition of fungus, somatic structures, 2.2Types of fungal thalli, fungal tissues, modifications of thallus, 2.3Reproduction (asexual and sexual)

UNIT 3 : Bacteria and Mollicutes

Bacteria – General Characters, Classification of plant pathogenic bacteria Important plant bacterial diseases and their causal agents

Mollicutes :Phyto plasma and Spiroplasma – General characters and important diseases and vectors

UNIT4 : Plant Viruses

Fastidious vascular Bacteria – general characters and important diseases and vectors

Viruses: General characters of plant viruses, nature, architecture

Symptoms of various viral diseases, transmission of plant viruses. Important plant viral diseases and their vectors.

UNIT 5: Viroids, phanerogamic plant parasites and plant parasitic nematodes, Viroids – General characters and important diseases

Phanerogamic plant parasites – general characters, propagation, survival and their hosts

Plant parasitic nematodes–general characters and important plant parasitic nematodes.

INTRODUCTION TO PLANT PATHOLOGY (PRACTICAL)

1. Study of lab equipments.
2. Preparation of PDA (Potato Dextrose Agar).
3. Preparation of NA (Nutrient Agar).
4. General study of different structures of fungi.
5. Study of symptoms of various plant diseases.
6. Staining and identification of plant pathogenic bacteria.
7. Study of phanerogamic parasites.
8. 30 Herbarium.

ANDHRA UNIVERSITY
B. Vocational course
AGRICULTURE
2020-21 Admitted Batch
I Year Semester – II
INTRODUCTION TO PLANT PATHOLOGY
MODEL QUESTION PAPER

SECTION – A

Answer any **FIVE** questions. Each question carries equal marks.

(5*5 = 25)

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.

SECTION – B

Answer **All** the questions. Each question carries **TEN** marks

(5*10 = 50)

9. a)

(OR)

- b)

10. a)

(OR)

- b)

11. a)

(OR)

- b)

12. a)

(OR)

- b)

13. a)

(OR)

- b)

ANDHRA UNIVERSITY
B. Vocational course
AGRICULTURE
2020-21 Admitted Batch
I Year Semester – II
INTRODUCTION TO PLANT BREEDING
(CREDITS 4+2=6)

UNIT-I-

Historical development, concept, nature and role of plant breeding, major achievements and future prospects; Genetics in relation to plant breeding; Heritability and genetic advance; modes of reproduction and apomixes; self – incompatibility and male sterility- genetic consequences, cultivar options;

UNIT-II-

Domestication, Acclimatization, introduction, Centre of origin/diversity; Genetic basis and breeding methods in self-pollinated crops-mass and pure line selection, hybridization techniques and handling of segregating population; Multiline concept; Concepts of population genetics and Hardy Weinberg Law;

UNIT-III-

Genetic basis and methods of breeding cross pollinated crops, modes of selection; Heterosis and inbreeding depression, development of inbred lines and hybrids, composite and synthetic varieties;

UNIT-IV-

Breeding methods in asexually propagated crops, clonal selection and hybridization; Wide hybridization and pre-breeding; Polyploidy in relation to plant breeding; mutation breeding-methods and uses;

UNIT-V

Breeding for important biotic and abiotic stresses; Biotechnological tools-DNA markers and marker assisted selection. Participatory plant breeding.

INTRODUCTION TO PLANT BREEDING (PRACTICAL)

- Plant Breeder's kit; Study of germplasm of various crops;
- Study of floral structure of self-pollinated and cross pollinated crops;
- Emasculation and hybridization techniques in self & cross pollinated crops;
- Consequences of inbreeding on genetic structure of resulting populations;
- Study of male sterility system; Handling of segregation populations;
- Methods of calculating mean, range, variance, standard deviation.
- Designs used in plant breeding experiment, analysis of Randomized Block Design;
- Estimation of heterosis, inbreeding depression and heritability;
- Layout of field experiments;
- Work out the mode of pollination in a given crop and extent of natural out crossing;
- Prediction of performance of double cross hybrids.

ANDHRA UNIVERSITY
B. Vocational course
AGRICULTURE
2020-21 Admitted Batch
I Year Semester – II
INTRODUCTION TO PLANT BREEDING
MODEL QUESTION PAPER

SECTION – A

Answer any **FIVE** questions. Each question carries equal marks.

(5*5 = 25)

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.

SECTION – B

Answer **All** the questions. Each question carries **TEN** marks

(5*10 = 50)

9. a)

(OR)

b)

10. a)

(OR)

b)

11. a)

(OR)

b)

12. a)

(OR)

b)

13. a)

(OR)

b)

ON JOB TRAINING – II

- I. **FIELD TRIP (3)** : 3 trips X 5 M = 15 Marks (Attendance for each trip 5 marks)
- II. **PROJECT REPORT** : 10 Marks
- III. **FIELD WORK** : 10 X 1M Per Practcal= 10 Marks
- IV. **ECONOMICAL SURVEY** : 2.5M X2 FARMERS=5 MARKS (Interaction with two farmers and gathering the data)
- V. **SEMINAR** : 5 Marks
- VI. **VIVA** : 5 Marks

- TOTAL MARKS** : **50 Marks**

2ND YEAR	III SEM	1.	English (Language)	3+0=3
		2.	Organic Chemistry (General education)	3+0=3
		3.	Health & Hygiene (Skill development)	2+0=2
		4.	Environmental Education (Skill development)	2+0=2
		5.	Disaster Management (Core subject)	4+2=6
		6.	Agronomy of Field Crops (Core subject)	4+2=6
		7.	Pests of Field Crops & their Management (Core subject)	4+2=6
		8.	Manures, Fertilizers & Soil Fertility Management (Core subject)	4+2=6
		Total Credits 24+6=30		

ANDHRA UNIVERSITY

B. Vocational course

AGRICULTURE

2020-21 Admitted Batch

II Year – Semester III

English - 3

(CREDITS 3+0=3)

Learning Outcomes

By the end of the course the learner will be able to :

- ★ Speak fluently in English
- ★ Participate confidently in any social interaction
- ★ Face any professional discourse
- ★ Demonstrate critical thinking
- ★ Enhance conversational skills by observing the professional interviews

I. UNIT

- Speech** : 1. Tryst with Destiny Jawaharlal Nehru
- Skills** : 2. Greetings
- : 3. Introductions

II. UNIT

- Speech** : 1. Yes, We Can Barack Obama
- Interview** : 2. A Leader Should Know How to Manage Failure
Dr.A.P.J.Abdul Kalam/ India Knowledge at Wharton
- Skills** : 3. Requests

III. UNIT

- Interview** : 1. Nelson Mandela's Interview With Larry King
- Skills** : 2. Asking and Giving Information
- : 3. Agreeing and Disagreeing

IV. UNIT

- Interview** : 1. JRD Tata's Interview With T.N.Ninan
- Skills** : 2. Dialogue Building
- : 3. Giving Instructions/Directions

V. UNIT

- Speech** : 1. You've Got to Find What You Love Steve Jobs
- Skills** : 2. Debates
- : 3. Descriptions
- : 4. Role Play

ANDHRA UNIVERSITY
B. Vocational course
AGRICULTURE
2020-21 Admitted Batch
II Year – Semester III
ENGLISH - 3
MODEL QUESTION PAPER

Max. Marks: 50

Time: 1½ hrs (90 Minutes)

SECTION- A

(4x5M=20 Marks)

Answer any four questions. Each answer carries 5 marks (At least 1 question should be given from each Unit)

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.

SECTION B

(3x10M = 30 Marks)

Answer any three questions. Each answer carries 10 marks (At least 1 question should be given from each Unit)

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

ANDHRA UNIVERSITY
B. Vocational course
AGRICULTURE
2020-21 Admitted Batch
II Year – Semester III
ORGANIC CHEMISTRY
(CREDITS 3+0=3)

UNIT-I

Structural theory in Organic Chemistry. Types of bond fission and organic reagents (Electrophilic, Nucleophilic, and free radical reagents including neutral molecules like H_2O , NH_3 & AlCl_3). Bond polarization: Factors influencing the polarization of covalent bonds, electro negativity - inductive effect. Application of inductive effect (a) Basicity of amines (b) Acidity of carboxylic acids (c) Stability of carbonium ions. Resonance or Mesomeric effect, application to (a) acidity of phenol, and (b) acidity of carboxylic acids. Hyperconjugation and its application to stability of carbonium ions, Free radicals and alkenes, carbanions, carbenes and nitrenes. Types of Organic reactions : Addition - electrophilic, nucleophilic and free radical. Substitution - electrophilic, nucleophilic and free radical. Elimination- Examples.

UNIT-II

Acyclic Hydrocarbons

Alkenes - Preparation of alkenes. Properties: Addition of hydrogen - heat of hydrogenation and stability of alkenes. Addition of halogen and its mechanism. Addition of HX , Markonikov's rule, addition of H_2O , HOX , H_2SO_4 with mechanism and addition of HBr in the presence of peroxide (anti - Markonikov's addition). Dienes - Types of dienes, reactions of conjugated dienes - 1,2 and 1,4 addition of HBr to 1,3 – butadiene and Diel's - Alder reaction.

Alkynes - Preparation by dehydrohalogenation of dihalides, dehalogenation of tetrahalides, Properties; Alicyclic hydrocarbons (Cycloalkanes) Nomenclature, Preparation by Freunds method, Wislicenus method. Properties - reactivity of cyclopropane and cyclobutane by comparing with alkanes, Stability of cycloalkanes - Baeyer's strain theory.

UNIT-III

Benzene and its reactivity. Concept of resonance, resonance energy. Heat of hydrogenation, heat of combustion of Benzene, mention of C-C bond lengths and orbital picture of Benzene. Concept of aromaticity - aromaticity (definition), Huckel's rule - application to Benzenoid (Benzene, Naphthalene) and Non - Benzenoid compounds (cyclopropenyl cation, cyclopentadienyl anion and tropylium cation) Reactions - General mechanism of electrophilic substitution, mechanism of nitration, Friedel Craft's alkylation and acylation. Orientation of aromatic substitution – Definition of ortho, para and meta directing groups. Ring activating and deactivating groups with examples (Electronic interpretation of various groups like NO_2 and Phenolic). Orientation of (i) Amino, methoxy and methyl groups (ii) Carboxy, nitro, nitrile, carbonyl and sulphonic acid groups (iii) Halogens (Explanation by taking minimum of one example from each type)

UNIT – IV

Halogen compounds

Nomenclature and classification of alkyl (into primary, secondary, tertiary), aryl, aryl alkyl, allyl, vinyl, benzyl halides. Nucleophilic aliphatic substitution reaction- classification into SN^1 and SN^2 – reaction mechanism with examples – Ethyl chloride, t-butyl chloride.

Hydroxy compounds

Nomenclature and classification of hydroxy compounds. Alcohols: Preparation with hydroboration reaction, Grignard synthesis of alcohols. Phenols: Preparation i) from diazonium salt, ii) from aryl sulphonates, iii) from cumene. Special reaction of phenols: Bromination, Kolbe-Schmidt reaction, Reimer-Tiemann reaction, Fries rearrangement, azocoupling, Pinacol-Pinacolone rearrangement.

UNIT-V

Carbonyl compounds

Nomenclature of aliphatic and aromatic carbonyl compounds, structure of the carbonyl group. Synthesis of aldehydes from acid chlorides, synthesis of aldehydes and ketones using 1,3-dithianes, synthesis of ketones from nitriles and from carboxylic acids.

Nucleophilic addition reaction with a) $NaHSO_3$, b) HCN , c) $RMgX$, d) NH_2OH , e) $PhNHNH_2$, f) 2,4 DNPH, g) Alcohols-formation of hemiacetal and acetal. Base catalysed reactions: a) Aldol, b) Cannizzaro's reaction, c) Perkin reaction, d) Benzoin condensation, e) Haloform reaction, f) Knoevenagel reaction. Oxidation of aldehydes-Baeyer-Villiger oxidation of ketones. Reduction: Clemmensen reduction, Wolf-Kishner reduction, MPV reduction, reduction with $LiAlH_4$ and $NaBH_4$.

List of Reference Books

1. A Text Book of Organic Chemistry by B.S. Bahl and Arun Bahl
2. A Text Book of Organic chemistry by Vol I by I.L. Finar Vol I
3. Organic chemistry by Bruice
4. Organic chemistry by Clayden
5. A Text Book of Organic Chemistry by B.S. Bahl and Arun Bahl

ORGANIC CHEMISTRY (PRACTICAL) ORGANIC QUALITATIVE ANALYSIS:

Analysis of an organic compound through systematic qualitative procedure for functional group identification of following compounds.

Alcohols, Phenols, Aldehydes, ketones, carboxylic Acids and Amides.

ANDHRA UNIVERSITY
B. Vocational course
AGRICULTURE
2020-21 Admitted Batch
II Year – Semester III
ORGANIC CHEMISTRY
MODEL QUESTION PAPER

Max. Marks: 50

Time: 1½ hrs (90 Minutes)

SECTION- A

(4x5M=20 Marks)

Answer any four questions. Each answer carries 5 marks (At least 1 question should be given from each Unit)

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.

SECTION B

(3x10M = 30 Marks)

Answer any three questions. Each answer carries 10 marks (At least 1 question should be given from each Unit)

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

ANDHRA UNIVERSITY
B. Vocational course
AGRICULTURE
2020-21 Admitted Batch
II Year – Semester III
HEALTH & HYGIENE
(CREDITS 2+0=2)

Learning / Course Outcomes: On completion of this course, the students will be able to understand -

- ★ What is a healthy diet
- ★ How can we use available information to optimize our diet?
- ★ Can nutrition be used for a healthy life?
- ★ Is there a one-size-fits-all “good” diet or should we individualize our dietary goals?
- ★ Disaster management and responsiveness of public in pandemic and epidemic diseases
- ★ Assess the impact of policies on health and hygiene Health measures to consider while travelling
- ★ Awareness in public through digital media viz., mobile apps

UNIT I: Basics of Nutrition

- Nutrition – definition, importance, Good nutrition and mal nutrition; Balanced Diet: Basics of Meal Planning
- Carbohydrates – functions, dietary sources, effects of deficiency.
- Lipids – functions, dietary sources, effects of deficiency.
- Proteins – functions, dietary sources, effects of deficiency.
- Brief account of Vitamins- functions, food sources, effects of deficiency,
- Macro and micro minerals – functions, effects of deficiency; food sources of Calcium, Potassium and Sodium; food sources of Iron, Iodine and Zinc
- Importance of water – functions, sources, requirement and effects of deficiency.

UNIT II: Health

- Health - Determinants of health, Key Health Indicators, Environment health & Public health; Health-Education: Principles and Strategies
- Health Policy & Health Organizations: Health Indicators and National Health Policy of Govt. of India-2017; Functioning of various nutrition and health organizations in India viz., NIN (National Institution of Nutrition), FNB (Food and Nutrition Board), ICMR (Indian Council of Medical Research), IDA (Indian Dietetics Association), WHO-India, UNICEF-India
- National Health Mission: National Rural Health Mission (NRHM) Framework, National Urban Health Mission (NUHM) Framework
- Women & Child Health Care Schemes: Reproductive, Maternal, Newborn, Child and Adolescent Health (RMNCH+); Janani Shishu Suraksha Karyakaram (JSSK); Rashtriya Bal Swasthya Karyakram (RBSK); India Newborn Action Plan (INAP); Adolescent Health- Rashtriya Kishor Swasthya Karyakram (RKSK)
- Disaster Management – Containment, Control and Prevention of Epidemics and Pandemics – Acts, Guidelines and Role of Government and Public

UNIT III: Hygiene

- Hygiene – Definition; Personal, Community, Medical and Culinary hygiene; WASH (WAter, Sanitation and Hygiene) programme
- Rural Community Health: Village health sanitation & Nutritional committee (Roles & Responsibilities); About Accredited Social Health Activist (ASHA); Village Health Nutrition Day, Rogi Kalyan Samitis
- Community & Personal Hygiene: Environmental Sanitation and Sanitation in Public places
- Public Awareness through Digital Media - An Introduction to Mobile Apps of Government of India: NHP, Swasth Bharat, No More Tension, Pradhan Mantri Surakshit Mantritva Abhiyan (PM Suman Yojana), My Hospital (Mera aspaatal), India fights Dengue, JSK Helpline, Ayushman Bhava, Arogya Setu, Covid 19AP

REFERENCES

1. **Bamji, M.S., K. Krishnaswamy & G.N.V. Brahman (2009)** *Textbook of Human Nutrition(3rd edition)* Oxford and IBH Publishing Co. Pvt. Ltd., New Delhi
2. **Swaminathan (1995)***Food & Nutrition*(Vol I, Second Edition) The Bangalore Printing &Publishing Co Ltd., , Bangalore
3. **Vijaya Khader (2000)**Food, nutrition & health, Kalyan Publishers, New Delhi
4. **Srilakshmi, B., (2010)***Food Science, (5th Edition)* New Age International Ltd., New Delhi
5. Weblinks: <https://nhm.gov.in/>
 - National Rural Health Scheme:
<https://nhm.gov.in/index1.php?lang=1&level=1&sublinkid=969&lid=49>
 - National Urban Health Scheme:
<https://nhm.gov.in/index1.php?lang=1&level=1&sublinkid=970&lid=137>
 - Village health sanitation & Nutritional committee
<https://nhm.gov.in/index1.php?lang=1&level=1&sublinkid=149&lid=225>
 - About Accredited Social Health Activist (ASHA)
<https://nhm.gov.in/index1.php?lang=1&level=1&sublinkid=150&lid=226>
 - Village Health Nutrition Day
<https://nhm.gov.in/index1.php?lang=1&level=1&sublinkid=152&lid=228>
 - Rogi Kalyan Samitis
<https://nhm.gov.in/index1.php?lang=1&level=1&sublinkid=153&lid=229>
 - Health Impact Assessment - <https://www.who.int/hia/about/faq/en/> (suggested information only)
http://www.euro.who.int/_data/assets/pdf_file/0011/261929/Health-in-Impact-Assessments-final-version.pdf?ua=1
 - WASH
<https://www.unicef.org/wash/and>
[https://www.unicef.org/wash/files/UNICEF Strategy for WASH 2016 203 0.PDF](https://www.unicef.org/wash/files/UNICEF_Strategy_for_WASH_2016_203_0.PDF)
 - Healthy Living <https://www.nhp.gov.in/healthylivingViewall>

ANDHRA UNIVERSITY
B. Vocational course
AGRICULTURE
2020-21 Admitted Batch
II Year – Semester III
HEALTH & HYGIENE
MODEL QUESTION PAPER

Max. Marks: 50

Time: 1½ hrs (90 Minutes)

SECTION- A

(4x5M=20 Marks)

Answer any four questions. Each answer carries 5 marks (At least 1 question should be given from each Unit)

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.

SECTION B

(3x10M= 30 Marks)

Answer any three questions. Each answer carries 10 marks (At least 1 question should be given from each Unit)

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

ANDHRA UNIVERSITY
B. Vocational course
AGRICULTURE
2020-21 Admitted Batch
II Year – Semester III
ENVIRONMENTAL EDUCATION
(CREDITS 2+0=2)

Learning outcomes: On completion of this course the students will be able to

- ★ Understand the nature, components of an ecosystem and that humans are an integral part of nature.
- ★ Realize the importance of environment, the goods and services of a healthy biodiversity, dependence of humans on environment.
- ★ Evaluate the ways and ill effects of destruction of environment, population explosion on ecosystems and global problems consequent to anthropogenic activities.
- ★ Discuss the laws/ acts made by government to prevent pollution, to protect biodiversity and environment as a whole.
- ★ Acquaint with international agreements and national movements, and realize citizen's role in protecting environment and nature.

UNIT I- Environment and Natural Resources

- Multidisciplinary nature of environmental education; scope and importance.
- Man as an integral product and part of the Nature.
- A brief account of land, forest and water resources in India and their importance.
- Biodiversity : Definition; importance of Biodiversity – ecological, consumptive, productive, social, ethical and moral, aesthetic, and option value.
- Levels of Biodiversity: genetic, species and ecosystem diversity.

UNIT-II- Environmental degradation and impacts

- Human population growth and its impacts on environment; land use change, land degradation, soil erosion and desertification.
- Use and over-exploitation of surface and ground water, construction of dams, floods, conflicts over water (within India).
- Deforestation: Causes and effects due to expansion of agriculture, firewood, mining, forest fires and building of new habitats.
- Non-renewable energy resources, their utilization and influences.
- A brief account of air, water, soil and noise pollutions; Biological, industrial and solid wastes in urban areas. Human health and economic risks.
- Green house effect - global warming; ocean acidification, ozone layer depletion, acid rains and impacts on human communities and agriculture.
- Threats to biodiversity: Natural calamities, habitat destruction and fragmentation, over exploitation, hunting and poaching, introduction of exotic species, pollution, predator and pest control.

UNIT III- Conservation of Environment

- Concept of sustainability and sustainable development with judicious use of land, water and forest resources; afforestation.
- Control measures for various types of pollution; use of renewable and alternate sources of energy.
- Solid waste management: Control measures of urban and industrial waste.
- Conservation of biodiversity: In-situ and ex-situ conservation of biodiversity.
- Environment Laws: Environment Protection Act; Act; Wildlife Protection Act; Forest Conservation Act.
- International agreements: Montreal and Kyoto protocols; Environmental movements: Bishnois of Rajasthan, Chipko, Silent valley.

Suggested activities to learner

- Visit to an area to document environmental assets: river/ forest/ flora/fauna, etc
- Visit to a local polluted site-Urban/Rural/Industrial/Agricultural site.
- Study of common plants, insects, birds and basic principles of identification.
- Study of simple ecosystems-forest, tank, pond, lake, mangroves etc.
- Case study of a Forest ecosystem or a pond ecosystem.

Suggested text book :

1. Erach Barucha (2004) *Text book of Environmental Studies for Undergraduate courses* (Prepared for University Grants Commission) Universities Press.
2. Purnima Smarath (2018) *Environmental studies* Kalyani Publishers, Ludhiana

Reference books :

- Odum, E.P., Odum, H.T. & Andrews, J. (1971) *Fundamentals of Ecology*. Philadelphia: Saunders.
- Pepper, I.L., Gerba, C.P. & Brusseau, M.L. (2011). *Environmental and Pollution Science*. Academic Press.
- Raven, P.H., Hassenzahl, D.M. & Berg, L.R. (2012) *Environment. 8th edition*. John Wiley & Sons.
- Singh, J.S., Singh, S.P. and Gupta, S.R. (2014) *Ecology, Environmental Science and Conservation*. S. Chand Publishing, New Delhi.
- Sengupta, R. (2003) *Ecology and economics: An approach to sustainable development*. OUP.
- Wilson, E. O. (2006) *The Creation: An appeal to save life on earth*. New York: Norton.
- Groom, Martha J., Gary K. Meffe, and Carl Ronald Carroll (2006) *Principles of Conservation Biology*. Sunderland: Sinauer Associates

ANDHRA UNIVERSITY
B. Vocational course
AGRICULTURE
2020-21 Admitted Batch
II Year – Semester III
ENVIRONMENTAL EDUCATION
MODEL QUESTION PAPER

Max. Marks: 50

Time: 1½ hrs (90 Minutes)

SECTION- A

(4x5M=20 Marks)

Answer any four questions. Each answer carries 5 marks
(At least 1 question should be given from each Unit)

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.

SECTION B

(3x10M= 30 Marks)

Answer any three questions. Each answer carries 10 marks(At
least 1 question should be given from each Unit)

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

ANDHRA UNIVERSITY
B. Vocational course
AGRICULTURE
2020-21 Admitted Batch
II Year – Semester III
DISASTER MANAGEMENT
(CREDITS 2+0=2)

Learning Outcomes:

After successful completion of the course, the students are able to;

- ★ Understand the nature, cause and effects of disasters
- ★ Comprehend the importance of Disaster Management and the need of awareness
- ★ Acquire knowledge on disaster preparedness, recovery remedial measures and personal precautions
- ★ Volunteer in pre and post disaster management service activities

UNIT-I-

Introduction of Disaster - Different types of disasters- Natural- (flood, cyclone, earthquake, famine and pandemic) - Accidental- (Fire, Blasting, Chemical leakage, Rail, Aviation, Road boat tragedies and nuclear pollution) - Disaster Management Act 2005

UNIT-II-

Causes and immediate effects of Disasters - Preparedness of disasters –Precautions – Dissemination of information - Nature and concepts - Role of National Disaster Management Authority and Role of Government and non-governmental organizations in protecting human livestock and natural resources.-Use of technology -Role of Citizens and Youth in the prevention.

UNIT-III -

Post disaster effects - short term - Procedures for Rehabilitation and Recovery - Role of volunteers and Safety Precautions - Long term remedial and preventive measures – Collection, filing and storage of information - Case studies

Suggested co curriculum Activities:

1. Invite lectures by local experts
2. Training on preparedness, post disaster services
3. Analysis of Case studies
4. Visit to a disaster management office and facility
5. Assignments, Group discussion, quiz etc.

References:

1. Jagbirsingh - Disaster Management Future challenges and opportunities- -K.W.Publishers
2. GOI - UNDP Disaster Management Guidelines
3. J.P.Singhal - Disaster Management - Laxmi Publications
4. www.ndma.gov.in
5. Wikipedia and other websites on Disaster management

ANDHRA UNIVERSITY
B. Vocational course
AGRICULTURE
2020-21 Admitted Batch
II Year – Semester III
DISASTER MANAGEMENT
MODEL QUESTION PAPER

Max Marks: 50

Time: 1 ½ hr (90 Min)

SECTION A

(Total: 4x5=20 Marks)

(Answer any four questions. Each answer carries 5 marks
(At least 1 question should be given from each Unit)

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.

SECTION B

(Total: 3x10 = 30 Marks)

(Answer any three questions. Each answer carries 10 marks
(At least 1 question should be given from each Unit)

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.

ANDHRA UNIVERSITY
B. Vocational course
AGRICULTURE
2020-21 Admitted Batch
II Year – Semester III
AGRONOMY OF FIELD CROPS
(CREDITS 4+2=6)

UNIT-I: CEREALS : Rice, wheat.

UNIT-II: MILLETS : Maize, sorghum, Pearl millet, Finger millet, Proso millet, Kodo millet, Foxtail millet, Little millet, Barnyard millet

UNIT-III: PULSES: Pigeon pea, Green gram, Black gram, Bengal gram, Peas, Horse gram, Cowpea

UNIT-IV: OIL SEEDS: Ground nut , Sesame, Sunflower, Castor, Rape seed, mustard, safflower, niger, Coconut and oil palm

UNIT-V:SUGAR & FIBER CROPS: Sugarcane, Sweet sorghum, Cotton, Jute, Mestha, Sunhemp

UNIT-VI: OTHER CROPS AND FODDER CROPS:: Tobacco, Fodder, sorghum, cowpea, napier, lucern, berseam, oats

Reference Books

1. Reddy , S R and Reddi Ramu 5th edition 2016, Agronomy of Field Crops- kalyani publishers, Ludhiana.
2. Chidida Singh, singh ,P and Singh R, Modern Techniques of Raising field crops-oxford publishing house, New Delhi.
 3. Rajendra Prasad 2004 text book of Field Crop Production Volume i, Volume ii
 4. Panda S C 2014 Agronomy of Fodder a forage crops, kalyani publishers Ludhiana

AGRONOMY OF FIELD CROPS (PRACTICAL)

1. Identification of cereals, millets, pulses, oil seed, sugar and fibre crops in the crop cafeteria.
2. Practicing various nursery types and main field preparation for field crops.
3. Acquiring skill in different seed treatment techniques in important field crops.
4. Estimation of plant population, seed rate and fertilizer requirement for important field crops.
5. Acquiring skill in field preparation, sowing and manuring of crops under pure and intercropping situations for field crops.
6. Acquiring skill in using seed drill for sowing operations.
7. Observations on growth parameters of cereals, millets, pulses, green manures and forage crops.
8. Study on yield parameters and estimation of yield in field crops.
9. Working out cost and returns of important cereals, millets and pulses.
10. Collection of seeds of field crops.

ANDHRA UNIVERSITY
B. Vocational course
AGRICULTURE
2020-21 Admitted Batch
II Year – Semester III
AGRONOMY OF FIELD CROPS
MODEL QUESTION PAPER

Time: 3 Hours

Maximum: 75 Marks

SECTION – A

Answer any **FIVE** questions. Each question carries equal marks.

(5*5 = 25)

1. Differentiate between *Corchorus capsularis* & *Corchorus Olitorius*.
2. Explain about Sorghum effect.
3. Write about Retting process of Jute.
4. Write down the Nutritional values of Bajra & finger millet
5. Classification of wheat with scientific names
6. Write briefly about different types of nurseries practiced in Rice.
7. Write down some varieties of Wheat, Maize, Sunflower, Cotton & Sorghum.
8. Write down common names, scientific names and their origins of all major & minor millets.

SECTION – B

Answer **All** the questions. Each question carries **TEN** marks

(5*10 = 50)

1. a) Write down the importance of pulses in india.
(OR)
b) Write down the importance of oilseeds in india.
2. a) Write about SRI Method of rice cultivation.
(OR)
b) Write about all planting methods of sugarcane.
3. a) Write general package of practices of millets.
(OR)
b) Write general package of practices of oilseeds.
4. a) Write about nutrient management of Rice, wheat & Maize.
b) Write about nutrient management of Groundnut, Cotton & Sunflower.
5. a) Write Seed rate, sowing, nutrient management, water Management, Weed Management, harvesting & yield of groundnut.
(OR)
b) Write seed rate, sowing, nutrient Management, Water Management, Weed Management, harvesting & yield of Rice.

ANDHRA UNIVERSITY
B. Vocational course
AGRICULTURE
2020-21 Admitted Batch
II Year – Semester III
PESTS OF FIELD CROPS AND THEIR MANAGEMENT
(CREDITS 4+2=6)

- UNIT: I-** Pests of Cereals and Millets Distribution, bionomics, symptoms of damage and management strategies for insect pests and integrated pest management of rice, wheat, maize, sorghum and ragi.
- UNIT II-** Pests of Pulses and Oilseeds Distribution, bionomics, symptoms of damage and management strategies of insect pests and integrated pest management of pulses (grams, cowpea.), groundnut, castor, gingelly, sunflower, safflower, soybean and mustard.
- UNIT III-** Pests of Cotton and Sugarcane Distribution, bionomics, symptoms of damage and management strategies of insect pests and integrated pest management of cotton and sugarcane.
- UNIT IV-** Pests of Green Manures, Stored Products, bionomics, symptoms of damage and management strategies of pests of green manures (Sunnhemp, Sesbania, Daicha) and stored products.
- UNIT V-** Rodents and birds of agricultural importance and their management. Locusts and their management.

PESTS OF FIELD CROPS AND THEIR MANAGEMENT
(PRACTICAL)

1. Pests of rice
2. Pests of maize, sorghum
3. Pests of wheat and ragi
4. Pests of grams and cowpea
5. Pests of groundnut, gingelly and sunflower
6. Pests of castor, soybean, safflower and mustard
7. Pests of cotton
8. Pests of sugarcane
9. Pests of stored products
10. Gadgets for management of stored product insects.
11. Calculation on the doses and their application techniques
12. Assessment of losses in stored grain pests, fumigation of grains stored in godowns
13. Visit to nearest FCI/AWC/SWC godown.

Reference Books

1. Vasanthraj David. B and Rama murthy VV 2016 Elements of Economic Entomology, popular book depot, Coimbatore
2. Vasanthraj David. B and Ananthakrishnan T.N. 2016. General and applied Entomology, Tata McGraw-Hill publishing house, New Delhi.
3. Nair MRGK 1986, Insects and Mites of Crops in India, ICAR, New Delhi.
4. Khare, S.P 1993 Stored Grain Pests and their Management, kalyani publishers, Ludhiana.

ANDHRA UNIVERSITY
B. Vocational course
AGRICULTURE
2020-21 Admitted Batch
II Year – Semester III
PESTS OF FIELD CROPS AND THEIR MANAGEMENT
MODEL QUESTION PAPER

Time: 3 Hours

Maximum: 75 Marks

SECTION – A

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

1. Write down symptoms and management for Brown Plant Hopper and Green Leaf Hopper of paddy.
2. Write down symptoms and management for Stem borer and Corn worm or ear worm of maize.
3. Write down symptoms and management for Red hairy caterpillar and leaf hopper.
4. Write down symptoms and management for Leaf eating caterpillar and Diamond back moth.
5. Write down symptoms and management for Root grub and Leaf miner of groundnut.
6. Write down symptoms and management for Pink bollworm and American boll worm of cotton.
7. Write down symptoms and management for Sugarcane scales and sugarcane pyrilla
8. List out the Internal and External feeders with their scientific names of stored grain pest.

SECTION – B

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

9. a) Write down IPM practices of Paddy.

(OR)

b) Write down symptoms and management for Mustard saw fly, Groundnut aphid and sorghum gall fly.

10.a) Write down IPM practices of Pulses.

(OR)

b) Write down symptoms and management for termites, castor shoot borer, and castor jassids.

11. a) Write down IPM practices of Cotton.

(OR)

b) Write down symptoms and management for spotted boll worm, Red cotton bug, and cotton thrips.

12. a) Write down IPM practices of Stored grain pest.

(OR)

b) Write down symptoms and management for Ragi pink borer, sorghum ear head bug, and sorghum midge.

13. a) Write down the management practices for Rodents

(OR)

b) List out the pests of birds and locusts with their scientific names and their management.

ANDHRA UNIVERSITY
B. Vocational course
AGRICULTURE
2020-21 Admitted Batch
II Year – Semester III
MANURES, FERTILIZERS AND SOIL FERTILITY MANAGEMENT
(CREDITS 4+2=6)

UNIT–I : Essential Nutrients Soil fertility and productivity-

Essential nutrients – functions, deficiency and toxicities. Concepts and methods of soil fertility evaluation.

UNIT–II : Nutrient Dynamics

Nutrients – sources, forms, mobility, transformations, fixation, losses and availability of nitrogen, phosphorus, potassium, calcium, magnesium, sulphur, iron, manganese, zinc, copper, boron, molybdenum, nickel, chloride in soils – Beneficial elements – Nutrient interactions.

UNIT–III : Classification of Fertilizers

Fertilizers – Definition and classification, sources, properties and reactions of primary, secondary and micro nutrient fertilizers in soil – Manufacture of urea, ammonium sulphate, SSP, DAP, MOP and SOP. Complex, mixed fertilizers, customized/Specialty fertilizers – Water soluble fertilizers, liquid fertilizers. Micro nutrient mixtures and chelated micronutrients – Preparation, characteristics and compatibility – Fertilizer Control Order (FCO). Manures – classification, nutrient content. Composting techniques.

UNIT–IV : Application Methods

Methods of fertilizer application – Seed coating, pelletization, seedling dipping – Nutriseed pack – Soil Application – Foliar spray – Fertigation – water soluble fertilizers, fertigation scheduling (Fertilizer – water interaction, fertilizer solubility, comparison of fertilizer application methods).

UNIT–V : Nutrient Management

Nutrient management concepts – INM, STCR, IPNS, SSNM and RTNM. Nutrient use efficiencies of major and micronutrients and enhancement techniques (Soil, Cultural and Fertilizer strategies). Soil health – Quality indices and their management – Long term effect of fertilization on soil.

UNIT–VI : Compost and composting- Green manures- Definitions of penning -Introduction and importance of organic manures- Bulky organic manures- Different methods of composting including the starters and raw materials

References

1. Indian Society of Soil Science. 2012. Fundamentals of Soil Science. IARI, New Delhi.
2. Yawalkar K.S, Agarwal, T.P and Bokde, S 1995. Manures and Fertilisers. Agril. Publishing House, Nagpur
3. Samuel Tisdale, Nelson Werner L, Beaton James D and Havlin John L. 2005. Soil Fertility and Fertilizers: An Introduction to Nutrient Management, Macmillan Publishing Co., New York.
4. D. K .Das 2014. Introductory Soil Science. Kalyani Publishers, New Delhi

MANURES, FERTILIZERS AND SOIL FERTILITY MANAGEMENT (PRACTICAL)

1. Introduction to analytical instruments and principles-spectrometry and flame photometry
2. Estimation of available N in soils
3. Estimation of available P in soils
4. Estimation of available K in soils
5. Estimation of available S in soils
6. Estimation of available Ca and Mg in soils
7. Estimation of available Zn in soils
8. Basics of plant analysis and estimation of N in plant samples
9. Estimation of P in plant samples
10. Estimation of K&S in plant samples
11. Identification of acid radicals in fertilizers / salts
12. Identification of basic radicals in fertilizers / salts
13. Estimation of N in Ammonium sulphate
14. Estimation of N in Urea and FYM
15. Estimation of water soluble P₂O₅ SSP
16. Estimation of K Muriate of potash or Sulphate of potash by using flame photometer.

ANDHRA UNIVERSITY
B. Vocational course
AGRICULTURE
2020-21 Admitted Batch
II Year Semester – III
MANURES, FERTILIZERS AND SOIL FERTILITY MANAGEMENT
MODEL QUESTION PAPER

SECTION – A

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

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.

SECTION – B

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

- | | | |
|----|----|------|
| 1. | a) | (OR) |
| | b) | |
| 2. | a) | (OR) |
| | b) | |
| 3. | a) | (OR) |
| | b) | |
| 4. | a) | (OR) |
| | b) | |
| 5. | a) | (OR) |
| | b) | |

ON JOB TRAINING - III

- I. FIELD TRIP (3) : 3 trips X 5 M = 15 Marks**
- II. PROJECT REPORT : 15 Marks**
- III. FIELD WORK : 10 X 1M = 10 Marks 1.**
- IV. SEMINAR : 5 Marks**
- V. VIVA : 5 Marks**
- VI. TOTAL MARKS : 50 Marks**

	IV SEM	1.	Physical Chemistry (General education)	3+0=3
		2.	Principles of Organic Farming (Core subject)	4+2=6
		3.	Weed & Water Management (Core subject)	4+2=6
		4.	Fungicides & Plant disease Management (Core subject)	4+2=6
		5.	Farm power & Machinery (Core subject)	4+2=6
		6.	Rain fed Agriculture & Water shed Management (Core subject)	4+2=6

ANDHRA UNIVERSITY
B. Vocational course
AGRICULTURE
2020-21 Admitted Batch
II Year – Semester IV
PHYSICAL CHEMISTRY
(CREDITS 3+0=3)

UNIT-I
SOLID-STATE

Symmetry in crystals. Law of constancy of interfacial angles. The law of rationality of indices. The law of symmetry. Definition of lattice point, space lattice, unit cell. Bravais lattices and crystal systems. X-ray diffraction and crystal structure. Bragg's law. Defects in crystals. Stoichiometric and non-stoichiometric defects.

UNIT-II

1. GASEOUS STATE

Deviation of real gases from ideal behavior. Vander Waal's equation of state. Andrew's isotherms of carbon dioxide. Critical phenomena. The Vander Waal's equation and the critical state. Law of corresponding states. Relationship between critical constants and Vander Waal's constants. Joule Thomson effect.

2. LIQUID STATE

Liquid crystals, the mesomorphic state. Classification of liquid crystals into Smectic and Nematic. Differences between liquid crystal and solid/liquid. Application of liquid crystals as LCD devices.

UNIT-III

DILUTE SOLUTIONS

Colligative properties. Raoult's law, relative lowering of vapour pressure, its relation to molecular weight of non-volatile solute. Elevation of boiling point and depression of freezing point. Experimental methods of determination. Osmosis, osmotic pressure, experimental determination. Abnormal Colligative properties- Van't Hoff factor.

UNIT-IV

Electrochemistry-I

Specific conductance, equivalent conductance. Variation of equivalent conductance with dilution. Migration of ions, Kohlrausch's law. Arrhenius theory of electrolyte dissociation and its limitations. Ostwald's dilution law. Debye- Huckel-Onsager's equation for strong electrolytes (elementary treatment only). Application of conductivity measurements- conductometric titrations.

UNIT-V

Electrochemistry - II

Single electrode potential, sign convention, Reversible and irreversible cells Nernst Equation- Reference electrode, Standard Hydrogen electrode, calomel electrode, Determination of EMF of cell, Applications of EMF measurements - Potentiometric titrations.

Phase rule

Concept of phase, components, degrees of freedom. Thermodynamic Derivation of Gibbs phase rule. Phase equilibrium of one component system - water system. Phase equilibrium of two- component system, solid-liquid equilibrium. Simple eutectic diagram of Pb-Ag system, simple eutectic diagram, Freezing mixtures.

List of Reference Books

1. Modern Electrochemistry by J.O. M. Bockris and A.K.N.Reddy
2. Advanced Physical Chemistry by Atkins 3.Introduction to Electrochemistry by S. Glasstone
4. Text Book of Physical Chemistry by Puri and Sharma

PHYSICAL CHEMISTRY (PRACTICAL)

1. Critical Solution Temperature- Phenol-Water system
2. Effect of NaCl on critical solution temperature (Phenol-Water system)
3. Determination of concentration of HCl conductometrically using standard NaOH solution.
4. Determination of concentration of acetic acid conductometrically using standard NaOH Solution.

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 modern agriculture.
- Different eco friendly farming systems- biological farming, natural farming, regenerative agriculture – permaculture - biodynamic farming.
- 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 in India.
- Organic nutrient sources and their fortification – organic manures- methods of composting
- Green manures- bio fertilisers – types, methods of application – benefits and limitations.

UNIT - III

- Nutrient use in organic farming-scope and limitations.
- Nutrient management in organic farming.
- Organic ecosystem and their concepts.
- Choice of crops and varieties in organic farming – crop rotations – need and benefits – multiple cropping.

UNIT - IV

- Fundamentals of insect, disease and weed management under organic mode of production- cultural- biological methods-non chemical pest and disease management.
- Botanicals- pyrethrum, neem seed kernel extract, neem seed powder, soluble neem formulations, neem oil.
- Operational structure of NPOP – other agencies for organic production.

UNIT - V

- Inspection – certification - labelling and accreditation procedures for organic products.
- Processing, - economic consideration and viability.
- Marketing and export potential of organic products – national economy.

PRINCIPLES OF ORGANIC FARMING (PRACTICAL)

1. Visit to organic farm to study the various components, identification and utilisation of organic products.
2. Compost making- aerobic and anaerobic methods
3. Vermicompost preparation
4. Preparation of enriched farm yard manure
5. Visit to organic clusters and bio control lab to study the maintenance of bio-fertilizers/bio-inoculant cultures
6. Biological nitrogen fixers.
7. Methods of application of Bio-pesticides (Trichocards, BT, NPV)
8. Preparation of neem products and other botanicals for pest and disease control
9. Preparation of green pesticides (panchagavya, beezamrutam, jeevamrutam, ghanajeevamrutam, dravajeevamrutam).
10. Different methods of biofertiliser applications.
11. Quality analysis of biofertilisers/bioinoculants and compost
12. Case studies of Indigenous Technical knowledge e (ITK) for nutrient , insect, pest, disease and weed management
13. Economic analysis of organic production system
14. Study of post harvest management in organic farming
15. Study of quality parameters of organic produce
16. Visit to organic farms to study the various components and their utilization

References

1. Arun K. Sharma. 2002. A Hand book of organic farming. 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 practices of organic farming. Satish Serial Publishing House. 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
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AGRICULTURE
2020-21 Admitted Batch
II Year Semester – IV
PRINCIPLES OF ORGANIC FARMING
MODEL QUESTION PAPER

SECTION – A

Answer any **FIVE** questions. Each question carries equal marks.

(5*5 = 25)

- 1.
- 2.
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SECTION – B

Answer **All** the questions. Each question carries **TEN** marks

(5*10 = 50)

1. a)

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ANDHRA UNIVERSITY
B. Vocational course
AGRICULTURE
2020-21 Admitted Batch
II Year – Semester IV
WEED AND WATER MANAGEMENT
(CREDITS 4+2=6)

UNIT-I : Weed Biology and Ecology Weeds:

Introduction, Definitions; harmful and beneficial effects, classification, propagation, dissemination and weed seed dormancy; Weed biology and ecology; Critical periods of crop weed competition and allelopathy. Principles of Weed Management Concepts of weed prevention, control and eradication; Methods of weed management: cultural, mechanical, chemical, biological and biotechnological methods; Integrated weed management.

UNIT-II : Herbicides

Herbicides: Definition – advantages and limitation of herbicide usage in India; Herbicide classification, formulations, methods of application; Introduction to Adjuvants and their use in herbicides. Weed management in field crops; aquatic, problematic, invasive alien weeds and their management.

UNIT-III : Importance and History of Irrigation

Role of water in plant growth – Importance of irrigation – Water resources and irrigation potential of India – History and development of irrigation in India – Irrigation systems of India. Soil – water– plant relationship – Soil Plant Atmospheric Continuum (SPAC) – Hydrological cycle – Moisture extraction pattern – Absorption of water – Evapotranspiration – Plant water stress and its effect and methods to overcome stress.

UNIT-IV : Crop Water Requirement and Management

Crop water requirement – Potential evapotranspiration (PET) and consumptive use – Definition and estimation – Factors affecting water requirement – Effective rainfall – Critical stages for irrigation – Water requirement of crops – Water management for major field crops.

UNIT-V : Methods of Irrigation

Scheduling of irrigation – Different approaches – Methods of irrigation: surface, sub – surface, sprinkler and drip irrigation – Micro irrigation: layout, suitability, merits and demerits – Fertigation – Water use efficiency – Methods to improve WUE – Conjunctive use of surface and ground water. Quality of irrigation water – Agronomic practices for use of poor quality water (saline, effluent and sewage water) for irrigation.

WEED AND WATER MANAGEMENT (PRACTICAL)

1. Identification, classification and characterization of terrestrial weeds.
2. Identification, classification and characterization of aquatic weeds and parasitic weeds.
3. Estimation of soil weed seed bank.
4. Identification, classification and characterization of herbicides.
5. Herbicide residue determination by bioassay techniques.
6. Practicing Skill development on herbicide application techniques and spray equipments.
7. Calculation on irrigation water based on source, water flow, soil moisture status and depth of irrigation and WUE.
8. Land leveling and land shaping – Beds and channels – check basin – ridges and furrows-border strips – broad bed furrow method of irrigation.
9. Operation and maintenance of sprinkler irrigation systems and drip irrigation systems.
10. Scheduling of irrigation based on simple techniques and devices.
11. Weed herbarium collection.

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2020-21 Admitted Batch
II Year Semester – IV
WEED AND WATER MANAGEMENT
MODEL QUESTION PAPER

SECTION – A

Answer any **FIVE** questions. Each question carries equal marks.

(5*5 = 25)

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SECTION – B

Answer **All** the questions. Each question carries **TEN** marks

(5*10 = 50)

1. a)

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ANDHRA UNIVERSITY
B. Vocational course
AGRICULTURE
2020-21 Admitted Batch
II Year – Semester IV
FUNGICIDES AND PLANT DISEASE MANAGEMENT
(CREDITS 4+2=6)

UNIT I

Introduction to plant pathology, terms and concepts used in plant pathology, history of plant pathology. Survival of plant pathogens. Dispersal of plant pathogens

UNIT II

Infection process – pre-penetration, penetration and post-penetration. Role of enzymes in pathogenesis. Role of toxins in pathogenesis

UNIT III

Defense mechanism in plants – structural, induced defense in plants. Plant disease epidemiology. Remote sensing

UNIT IV

Principles of plant disease management. Physical methods and biological methods. Protection – Classification of fungicides based on chemical nature and method of application

UNIT V

Host plant resistance. Integrated disease management. Application of bio-technology in plant disease management

FUNGICIDES AND PLANT DISEASE MANAGEMENT (PRACTICAL)

1. Survey and assessment of important plant diseases
2. Seeds health tests – dry seed examination, seed washing, blotter test
3. Preparation of bordeaux mixture
4. Methods of application of fungicides
5. Special methods of application – acid delinting, pseudostem injection, root feeding, pairing and pralinage, trunk injection
6. Mass multiplication of Trichoderma spp and method of application
7. Cross protection
8. Preparation of leaf extracts

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AGRICULTURE
2020-21 Admitted Batch
II Year Semester – IV
FUNGICIDES AND PLANT DISEASE MANAGEMENT
MODEL QUESTION PAPER

SECTION – A

Answer any **FIVE** questions. Each question carries equal marks.

(5*5 = 25)

- 1.
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SECTION – B

Answer **All** the questions. Each question carries **TEN** marks

(5*10 = 50)

1. a)

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AGRICULTURE
2020-21 Admitted Batch
II Year – Semester IV
FARM POWER AND MACHINERY
(CREDITS 4+2=6)

UNIT I:

Farm Power in INDIA – Introduction- Different sources of farm power- Merits and demerits of farm sources- status of farm power in India. Farm mechanization- Scope- Concept of farm mechanization Classifications of energy sources- Renewable- Non- renewable- Need of renewable energy sources- Types of renewable energy sources- Solar energy- Wind energy- Biogas.

UNIT II:

Heat engines- Introduction- Types- External combustion engine- Internal combustion engine- Classification of IC engine - Two stroke and Four stroke engine- Diesel engine- Petrol engine, Components of IC engine. Valve working and valve timing diagram.

UNIT III:

Tillage- Objectives- Classification- Primary Tillage and Secondary tillage implements, Types of tillage. Primary tillage implements- Mouldboard Plough, Disc Plough, Chisel Plough, Subsoiler, Components and Functions, Types, Advantages and Disadvantages.

UNIT IV:

Secondary Tillage implement– Harrows- Types- Animal drawn harrow- Tractor drawn harrow, cultivators- Types Land Forming Equipment-Wetland Equipment –Puddlers and Green Manure Trampers - cage wheels.

UNIT V:

Planting and fertilizing equipments- Methods of sowing- study of animal drawn seed cum ferti drill- study of tractor drawn seed cum ferti drill. Planters- potato, sugarcane planter, study of intercultivation equipments- weeders.

FARM POWER AND MACHINERY (PRACTICALS)

Study of different components of I.C. engine - To study air cleaning and cooling system of engine - Familiarization with clutch– Transmission - Differential and final drive of a tractor - Familiarization with lubrication and fuel supply system of engine - Familiarization with brake – Steering - Hydraulic control system of engine - Learning of tractor driving - Familiarization with operation of power tiller - Implements for hill agriculture - Familiarization with different types of primary and secondary tillage implements - Mould plough - Disc plough and disc harrow - Familiarization with seedcum-fertilizer drills their seed metering mechanism and calibration - Planters and transplanter - Familiarization with different types of sprayers and dusters - Familiarization with different inter-cultivation equipment - Familiarization with harvesting and threshing machinery.

TEXT BOOKS:

1. Jagdishwar Sahay (1977), Elements of Agricultural Engineering, Standard Publications, New Delhi.
2. Pakirappa and Naresh V (2014), Energy sources and power plant engineering, radiant Publishing House, Hyderabad.
3. Michel A.M, and Ojha T.P, Principles of Agricultural Engineering, Vol.I, Jain Brothers, New Delhi.

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AGRICULTURE
2020-21 Admitted Batch
II Year Semester – IV
FARM POWER AND MACHINERY
MODEL QUESTION PAPER

SECTION – A

Answer any **FIVE** questions. Each question carries equal marks.

(5*5 = 25)

- 1.
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SECTION – B

Answer **All** the questions. Each question carries **TEN** marks

(5*10 = 50)

1. a)

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ON JOB TRAINING – IV

- I. FIELD TRIP (3) : 3 trips X 5 M = 15 Marks**
- II. PROJECT REPORT : 15 Marks**
- III. FIELD WORK : 10 X 1M = 10 Marks 1.**
- IV. SEMINAR : 5 Marks**
- V. VIVA : 5 Marks**
- VI. TOTAL MARKS : 50 Marks**

ANDHRA UNIVERSITY
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AGRICULTURE
2020-21 Admitted Batch
II Year – Semester IV
RAIN FED AGRICULTURE AND WATERSHED MANAGEMENT
(CREDITS 4+2=6)

UNIT - I

1. Rainfed agriculture – introduction and definition – dimensions of the problem – area and production from dry lands in India and Andhra Pradesh –History of rainfed agriculture and watersheds in India.
2. Problems and prospects of rainfed agriculture in India – climate – rainfall pattern – distribution – variabilities of rainfall – short rainy season – high intensity rainfall
3. Problems and prospects of rainfed agriculture in India - soil characteristics – soil fertility status –soil moisture storage and retention capacity – heavy weed infestation-soil crust and their effect on crop growth and soils-its management.

UNIT - II

4. Drought – definition – types of drought – effect of water deficits on physio- morphological characteristics of the plants- mechanism of crop adaptation under moisture deficit condition - management strategies for drought.
5. Tillage for rainfed crops – off-season tillage – primary tillage –secondary tillage – year round tillage – sub soiling – setline cultivation – modern concepts of tillage- minimum tillage and zero tillage.
6. Soil erosion – definition – losses due to erosion – types of water and wind erosion – nature and extent of wind and water erosion – factors affecting erosion – universal soil loss equation

UNIT - III

7. Management of crops in rainfed areas - Agronomic measures of soil and water conservation – choice of crop – crop geometry – tillage – contour cultivation – strip cropping – cover cropping – mulching – cropping systems and weed control - Mechanical measures of soil and water management.
8. Watershed – definition – concept— objectives and principles of water shed management components of watershed development programme – factors affecting watershed management.
9. Water harvesting – importance, its techniques- Water harvesting structures – arid region – runoff farming – water spreading – micro catchments – semi arid region – farm ponds, check dams – percolation tank – dug wells – life saving irrigation

UNIT - IV

10. *In-situ* moisture conservation measures – bund forming – bunding, ridge and furrow system – conservation furrows- inter plot water harvesting, mulching – Broad Bed and Furrow (BBF) and leveling.
11. Fertilizer use in rainfed areas – use of organic manures – introduction of legumes in crop rotation– organic recycling and bio-fertilizer use in rainfed agriculture – time and method of fertilizer application
12. Efficient crops and varieties – cropping systems in rainfed areas – intercropping – advantages – efficient inter cropping systems in different rainfed regions of Andhra Pradesh

UNIT - V

13. Contingent crop planning for aberrant weather conditions in red and black soils.
14. Evapotranspiration – measures to reduce evapotranspiration – weeding, use of mulches, chemicals, windbreaks and shelterbelts
15. Land capability classification – alternate land use system
16. Efficient utilization of water through soil and crop management practices - agronomic measures - mechanical measures for soil and water conservation – gully control – bench terraces – contour terracing – graded bund

RAIN FED AGRICULTURE AND WATERSHED MANAGEMENT (PRACTICAL)

1. Climate classification.
2. Rainfall analysis - Mean, standard deviation, variance and CV.
3. Onset and withdrawal of monsoons and determination of length of growing crop season.
4. Study on cropping pattern of different dryland areas.
5. Mapping of dryland areas in India.
6. Interpretation of meteorological data for rainfall variability.
7. Scheduling of supplemental irrigation based on crop ET demand.
8. Critical analysis of rainfall and calculation of wet spells, dry spells, and length of growing season.
9. Calculation of effective rainfall.
10. Determination of moisture availability index.
11. Study of cultural practices for mitigating moisture stress (mulching, plant density, depth of sowing, thinning and leaf removal).
12. Visit to watershed.
13. Field demonstration on soil & moisture conservation measures.
14. Field demonstration of water harvesting structures.
15. Study of farm ponds as a source of supplemental irrigation.
16. Visit to rainfed research station.

References

1. Reddy, S. R. and Prabhakar Reddy, G. 2015. Dryland Agriculture. Kalyani Publishers.
2. Arnon, I. 1972. Crop Production in Dry Regions (Vol.I), Leonard Hill Pub. Co, London.
3. Dhruva Narayana, V.V., Sastry, G.S. and Patnaik, V.S. 1999. Watershed Management in India. ICAR, New Delhi.
4. Jeevananda Reddy, S. 2002. Dryland Agriculture in India: An agro-climatological and agro-meteorological perspective. B S publications.

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AGRICULTURE
2020-21 Admitted Batch
II Year Semester – IV
RAIN FED AGRICULTURE AND WATER SHED MANAGEMENT
MODEL QUESTION PAPER

SECTION – A

Answer any **FIVE** questions. Each question carries equal marks.

(5*5 = 25)

- 1.
- 2.
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SECTION – B

Answer **All** the questions. Each question carries **TEN** marks

(5*10 = 50)

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3RD YEAR	V SEM	1.	Environmental Chemistry (General education)	3+0=3
		2.	Fundamentals of Crop Physiology (Core subject)	4+2=6
		3.	Principles of Seed Technology (Core subject)	4+2=6
		4.	Horticulture (Core subject)	4+2=6
		5.	Introduction to Agricultural Economics and Farm Management (Core subject)	4+2=6
		6.	Project work (Field work)	0+4=4
		Total Credits 19+12=31		

ANDHRA UNIVERSITY
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2020-21 Admitted Batch
III Year Semester – V
ENVIRONMENTAL CHEMISTRY
(CREDITS 3+0=3)

UNIT-I- Introduction

Concept of Environmental chemistry - Scope and importance of environment in now a days – Nomenclature of environmental chemistry – Segments of environment - Natural resources – Renewable Resources – Solar and biomass energy and Non-renewable resources – Thermal power and atomic energy – Reactions of atmospheric oxygen and Hydological cycle.

UNIT-II- Air Pollution

Definition – Sources of air pollution – Classification of air pollution – Acid rain – Photochemical smog – Green house effect – Formation and depletion of ozone – Bhopal gas disaster – Controlling methods of air pollution.

UNIT-III- Water pollution

Unique physical and chemical properties of water – water quality and criteria for finding of water quality – Dissolved oxygen – BOD, COD, Suspended solids, total dissolved solids, alkalinity – Hardness of water – Methods to convert temporary hard water into soft water – Methods to convert permanent hard water into soft water – eutrophication and its effects – principal wastage treatment – Industrial waste water treatment.

UNIT-IV- Chemical Toxicology

Toxic chemicals in the environment – effects of toxic chemicals – cyanide and its toxic effects – pesticides and its biochemical effects – toxicity of lead, mercury, arsenic and cadmium.

UNIT-V- Ecosystem and biodiversity

Ecosystem: Concepts – structure – Functions and types of ecosystem – Abiotic and biotic components – Energy flow and Energy dynamics of ecosystem – Food chains – Food web – Tropic levels – Biogeochemical cycles (carbon, nitrogen and phosphorus)

Biodiversity: Definition – level and types of biodiversity – concept - significance – magnitude and distribution of biodiversity – trends - biogeographical classification of India – biodiversity at national, global and regional level.

REFERENCE BOOKS

1. Fundamentals of Ecology by M.C.Dash
2. A Text book of Environmental chemistry by W. Moore and F.A. Moore
3. Environmental Chemistry by Samir K. Banerji

ENVIRONMENTAL CHEMISTRY (PRACTICAL)

1. Determination of carbonate and bicarbonate in water samples (acidity and alkalinity)
2. Determination of hardness of water using EDTA
 - a) Permanent hardness
 - b) Temporary hardness
3. Determination of Acidity
4. Determination of Alkalinity
5. Determination of chlorides in water samples

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2020-21 Admitted Batch
III Year Semester – V
ENVIRONMENTAL CHEMISTRY
MODEL QUESTION PAPER

Max. Marks: 50

Time: 1½ hrs
(90 Minutes)

SECTION- A

(4x5M=20 Marks)

Answer any four questions. Each answer carries 5 marks

(At least 1 question should be given from each Unit)

- 1.
- 2.
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SECTION B

(3x10M = 30 Marks)

Answer any three questions. Each answer carries 10 marks

(At least 1 question should be given from each Unit)

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

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AGRICULTURE
2020-21 Admitted Batch
III Year Semester – V
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 functional characteristics - Plastids, mitochondria, oil bodies, peroxisomes and glyoxysomes - Structure and functions.

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 – Photoperiodism and flowering – Importance of photoperiodism – Classification of plants based on photoperiodic responses

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

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 – Commercial uses – Ethylene – Occurrence, transport, biosynthesis, mode of action and

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 with senescence.

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 viability and vigor - Physiological maturity, harvestable maturity - 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, leaf area measurement, Growth analysis, Measurement of water status in plants, 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, Effect of plant growth regulators on plant growth. Diagnosis of nutrient deficiency symptoms in crops, Yield analysis

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
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AGRICULTURE
2020-21 Admitted Batch
III Year Semester – V
FUNDAMENTALS OF CROP PHYSIOLOGY
MODEL QUESTION PAPER

SECTION – A

Answer any **FIVE** questions. Each question carries equal marks.

(5*5 = 25)

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SECTION – B

Answer **All** the questions. Each question carries **TEN** marks

(5*10 = 50)

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ANDHRA UNIVERSITY
B. Vocational course
AGRICULTURE
2020-21 Admitted Batch
III Year Semester – V
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 and hybrids.

UNIT III - Seed production techniques of agricultural crops

Floral biology and pollination behavior - seed production techniques of varieties and hybrids of: rice, maize, cotton varieties and hybrids – Bt cotton

UNIT IV - Seed production techniques of vegetable crops

Floral biology and pollination behavior - seed production techniques of varieties and hybrids of: tomato, snakegourd, bittergourd ,ashgourd, ribbed gourd and bottlegourd

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

Seed treatment - importance - types - Seed invigouration techniques - seed hardening - seed fortification - seed priming - Seed enhancement techniques - seed coating - seed pelleting.

PRINCIPLES OF SEED TECHNOLOGY (PRACTICAL)

1. Study of seed structure of agricultural and horticultural crops.
2. Seed dormancy breaking methods.
3. Acid delinting in cotton.
4. Detasseling techniques for hybrid seed production in maize.
5. Emasculation and dusting techniques for hybrid seed production in important field crops.
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 and cucurbits.
8. Seed cleaning and grading techniques and detection of seed mechanical injury.
9. Collection of seeds.

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AGRICULTURE
2020-21 Admitted Batch
III Year Semester – V
PRINCIPLES OF SEED TECHNOLOGY
MODEL QUESTION PAPER

SECTION – A

Answer any **FIVE** questions. Each question carries equal marks.

(5*5 = 25)

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SECTION – B

Answer **All** the questions. Each question carries **TEN** marks

(5*10 = 50)

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B. Vocational course
AGRICULTURE
2020-21 Admitted Batch
III Year Semester – V
HORTICULTURE
(CREDITS 4+2=6)

UNIT-I

1. Horticulture – Definition - Divisions of horticulture with suitable examples.
2. Scope and importance of horticulture - Importance of horticulture in terms of income, employment generation, industry, religious, aesthetic, food & nutritive value and export.
3. Horticultural classification based on soil, climate and botanical classification.
4. Climate and soil for horticultural crops - Influence of environmental factors on horticultural crop production – Temperature, humidity, wind, rainfall and solar radiation – Influence of soil factors – Soil type, 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, tuberous roots).
7. Grafting, budding -Rootstock and scion selection – Grafting methods – Attached scion methods of grafting, simple or approach grafting, detached scion methods of grafting (side grafting - Veneer grafting, apical grafting- epicotyl grafting, 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 ring budding - 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 - Layout of orchards – Systems of planting - Square, rectangle, quincunx, hexagonal and contour systems of planting-their merits and demerits.
9. Principles and methods of training and pruning - Definition of training, objectives and training, principles and methods of training of fruit crops - Open centre, closed centre and modified leader systems their merits and demerits - Definition of pruning, objectives of pruning, principles and methods of pruning of fruit crops.
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 fruit trees.

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 garden types – Formal – Informal – Wild Garden – Parts/ features of an ornamental garden.
13. Lawn making – Selection of Grass – Bermuda grass – Korean grass – Poa grass – Fescue grass – Kentucky blue grass - Grasses for shady areas – Site Selection – 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 compost and fertilizers - Diseases and other problems – Fairy ring – Pale Yellow Laws.

UNIT-V

14. Use of plant bio-regulators (PBR) in horticulture – Introduction – Applications of PBR in fruit crops.
15. Irrigation methods in horticulture crops - Different methods followed in horticultural crops (check basin, furrow, ring basin, basin, flood, pitcher, funnel, drip and sprinkler).
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 garden tools.
2. Identification of horticultural crops.
3. Layout of different planting systems.
4. Layout of kitchen garden.
5. Preparation of nursery bed (raised and flat beds) and sowing of seeds.
6. Practice of different asexual methods by divisions.
7. Practice of different asexual methods by cuttings.
8. Practice of different asexual methods by grafting.
9. Practice of different asexual methods by budding.
10. Practice of different asexual methods by layering.
11. Training and pruning of fruit trees.
12. Transplanting and care of vegetable seedlings.
13. Making of herbaceous and shrubbery borders.
14. Preparation of potting mixture, potting and repotting.
15. Fertilizer application in different crops.
16. Visits to commercial nurseries/orchard.

References

1. Chadha, K.L. 2001. *Handbook of Horticulture*. ICAR, New Delhi.
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., New Delhi
4. Kumar, N. 1997. *Introduction to Horticulture*. Rajyalakshmi Publications, Nagorcoil, Tamilnadu.

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2020-21 Admitted Batch
III Year Semester – V
HORTICULTURE
MODEL QUESTION PAPER

SECTION – A

Answer any **FIVE** questions. Each question carries equal marks.

(5*5 = 25)

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SECTION – B

Answer **All** the questions. Each question carries **TEN** marks

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2020-21 Admitted Batch
III Year Semester – V
INTRODUCTION TO AGRICULTURAL 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, and Mixed farming – Systems of farming: Peasant Farming, State Farming, Capitalistic, Collective and Co – operative Farming.

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 / Forms of Production functions – Linear, Cobb–Douglas and Quadratic – Cost Concepts and Cost curves: Total, Average and Marginal Costs – Economies of Scale – Economies of Size - 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 – Marginal Rate of Technical Substitution – Factor Intensity – Isocline – Ridge Line – 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 cost combination.

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 – Linear Programming Model: Definition, Graphical solution, Advantages and Limitations – Risk and Uncertainty: Definition – Types of Risk and Uncertainty – Safeguards against Risk and Uncertainty.

INTRODUCTION TO AGRICULTURAL ECONOMICS AND FARM MANAGEMENT (PRACTICAL)

Computation of depreciation cost of farm assets. Determination of most profitable level of inputs use in a farm production process. Application of equi-marginal returns/ opportunity cost principle 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.

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III Year Semester – V
INTRODUCTION TO AGRICULTURAL ECONOMICS AND FARM MANAGEMENT
MODEL QUESTION PAPER

SECTION – A

Answer any **FIVE** questions. Each question carries equal marks.

(5*5 = 25)

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SECTION – B

Answer **All** the questions. Each question carries **TEN** marks

(5*10 = 50)

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III Year Semester – V
PROJECT WORK-I
(CREDITS 0+4=4)

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| 1. Presentation of synopsis: | 20 Marks |
| 2. Desertation and evaluation : | 50 Marks |
| 3. Seminar : | 20 Marks |
| 4. Viva voice : | 5 Marks |
| 5. TOTAL MARKS : | 100 Marks |

	VI SEM	1.	Production Technology for Vegetables & Spices (Core subject)	4+2=6
		2.	Pests of Horticultural Crops & Productive Entomology (Core subject)	4+2=6
		3.	Breeding of Field Crops (Core subject)	4+2=6
		4.	Production Technology of Ornamental Crops, Medicinal & Aromatic Plants (Core subject)	4+2=6
		5.	Project Work (Field work)	0+4=4
		Total Credits 16+12=28		

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2020-21 Admitted Batch
III Year Semester – VI
PRODUCTION TECHNOLOGY FOR VEGETABLES AND SPICES
(CREDITS 4+2=6)

UNIT - I

Importance of vegetables and spices in human nutrition and national economy – Classification of vegetables - 1) Botanical 2) Based on Hardiness 3) Parts Used 4) Method of culture 5) Season.

Tomato- Botanical Name – Family – Origin – Area – Production- Improved varieties and cultivation practices such as time of sowing - Sowing - Transplanting techniques - Planting distance - Fertilizer requirements - Irrigation - Weed management - Harvesting - Yield - Storage - Physiological disorders - Disease and pest control and seed production.

Brinjal and Chilli - Botanical name – Family - Origin - Area - Production - Improved varieties and cultivation practices such as time of sowing - Sowing - Transplanting techniques - Planting distance - Fertilizer requirements - Irrigation - Weed management - Harvesting - Yield - Storage - Disease and pest control and seed production.

UNIT - II

Okra and Leafy vegetables (Amaranthus and Gogu) - Botanical name – Family - Origin - area - Production - Improved varieties and cultivation practices such as time of sowing - Sowing - Planting distance - Fertilizer requirements - Irrigation

Weed management - Harvesting - Yield - Storage - Disease and pest control and seed production.

Cucurbits – Flowering, sex expression, sex ratio - Cucumber, Ridge gourd, Bitter gourd, Bottle gourd- Botanical name – Family - Origin - Area - Production - improved varieties and cultivation practices such as time of sowing - Sowing - Planting distance - Fertilizer requirements - Irrigation - Weed management - Harvesting - Yield - Storage - Physiological disorders - Disease and pest control and seed production.

Melons – Watermelon and Muskmelon - Botanical name – Family - Origin - Area - Production - Improved varieties and cultivation practices such as time of sowing

sowing - Planting distance - Fertilizer requirements - Irrigation - Weed management - Harvesting - Yield – Production of seedless watermelons - Storage

Physiological disorders - Disease and pest control and seed production.

UNIT - III

Cole crops- Cabbage and Cauliflower -Botanical name – Family - Origin - Area - production - Improved varieties and cultivation practices such as time of sowing

Planting distance - Fertilizer requirements - Irrigation - Weed management - Harvesting - Yield –Storage - Physiological disorders - Disease and pest control and seed production.

Peas and beans (Cluster bean, French bean, Dolichos) - Botanical name – Family - Origin - Area - Production - Improved varieties and cultivation practices such as time of Sowing - sowing - Planting distance - Fertilizer requirements - Irrigation

Weed management - Harvesting - Yield –Storage - Physiological disorders - Disease and pest control and seed production.

Root crops (Carrot and Radish) - Botanical name – Family - Origin - Area - Production

Improved varieties and cultivation practices such as time of sowing - Sowing - Planting distance - Fertilizer requirements - Irrigation - Weed management - Harvesting - Yield - Storage - Physiological disorders (splitting, forking and cavity spot) - Disease and pest control and seed production.

UNIT - IV

Tapioca and Sweet potato - Botanical name – Family - Origin - Area - Production

Improved varieties and cultivation practices such as time of sowing - Sowing - Planting distance - Fertilizer requirements - Irrigation - Weed management - Harvesting - Yield - Storage - Physiological disorders - Disease and pest control and seed production.

Perennial vegetables – Drumstick and Curry Leaf- Botanical name – Family - Origin

Area - Production - Improved varieties and cultivation practices such as time of sowing - Sowing - Planting distance - Fertilizer requirements - Irrigation - Weed management - Harvesting - Yield - Storage - Physiological disorders - Disease and pest control and seed production.

Bulb crops – Onion and Garlic - Botanical name – Family - Origin - Area - Production

Improved varieties and cultivation practices such as time of sowing - Sowing - Planting distance - Fertilizer requirements - Irrigation - Weed management - Harvesting - Yield - Storage - Physiological disorders - Disease and pest control and seed production.

UNIT - V

Black pepper - Botanical name – Family - Origin - Introduction - Varieties - Climate- Soil – Systems of cultivation -Propagation - Planting - Shade regulation

Training and pruning - Fertilizer requirements - Irrigation - Intercultural operations - Harvesting – Processing - Yield - Pests and diseases.

Cardamom - Botanical name – Family - Origin - Introduction - Varieties - Climate- soil – Systems of cultivation - Propagation - Planting - Shade regulation – Fertilizer requirement - Irrigation - Intercultural operations - Harvesting – Processing - Yield - Pests and diseases.

Ginger and Turmeric – Botanical name – Family - Origin - Introduction - Varieties

Climate- Soil – Systems of cultivation - Propagation - Planting - Mulching – Fertilizer requirement - Irrigation - Intercropping - intercultural operations - Harvesting – Processing - yield - Pests and diseases – Preservation of seed rhizomes.

Cinnamon - Coriander and Fenugreek- Botanical name – Family - Origin - Area - Production - Improved varieties and cultivation practices such as time of sowing

Transplanting techniques - Fertilizer requirements - Irrigation - Intercultural operations - Harvesting - Pests and Diseases.

PRODUCTION TECHNOLOGY FOR VEGETABLES AND SPICES (PRACTICAL)

1. Identification of vegetables and their seeds.
2. Identification of spices crops and their seeds.
3. Nursery raising techniques of vegetable crops.
4. Direct seed sowing and transplanting.
5. Study of morphological characters of different vegetables.
6. Study of morphological characters of different spices.
7. Physiological disorders of vegetable crops.
8. Intercultural operations in vegetable crops.
9. Fertilizers application methods.
10. Seed extraction methods in vegetables.
11. Seed extraction methods in spices.
12. Harvest indices and maturity standards of vegetable crops.
13. Harvesting and preparation for market.
14. Economics of vegetables and spices cultivation.
15. Visit to vegetable farmer fields.
16. Visit to vegetable markets to study marketing problems.

References

1. Pranab Hazra, A. Chattopadhyay, K. Karmakar and S. Dutta. 2010. *Modern Technology in Vegetable Production*. New India Publishing Agency, New Delhi.
2. Neeraj Pratap Singh, .2007. *Basic Concepts of Vegetable Science*. International Book Distributing Co. New Delhi. Academic Press, New Delhi.
3. Nempal Singh, Singh, D.K., Singh, Y.K. and Virendra Kumar. 2006. *Vegetable Seed Production Technology*. International Book Distributing Co. Lucknow.
4. Prem Singh Arya and S. Prakash 2002. *Vegetables Growing in India*. Kalyani publishers, New Delhi

ANDHRA UNIVERSITY
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AGRICULTURE
2020-21 Admitted Batch
III Year Semester – VI
PRODUCTION TECHNOLOGY FOR VEGETABLES AND SPICES
MODEL QUESTION PAPER

SECTION – A

Answer any **FIVE** questions. Each question carries equal marks.

(5*5 = 25)

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SECTION – B

Answer **All** the questions. Each question carries **TEN** marks

(5*10 = 50)

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III Year Semester – VI
PESTS OF HORTICULTURAL CROPS & PRODUCTIVE ENTOMOLOGY
(CREDITS 4+2=6)

UNIT I

Importance and history of sericulture – organizations involved in sericulture – silkworm types-mulberry cultivation – varieties - morphology of mulberry plant – identification of popular mulberry genotypes – methods of propagation – nursery and main field preparation – planting methods – identification of nutrient deficiency symptoms – identification of weeds – herbicide application methods – irrigation methods and management practices

UNIT II

Rearing house – types – disinfection – room and bed disinfectants – egg incubation methods – chawki rearing – feeding, cleaning and spacing – rearing of late age worms – feeding, cleaning, spacing and moulting care different stages – spinning – mountages – harvesting. Visit to sericulture farms – interaction with sericulturists- visit to grainage and cocoon market-economics of mulberry silkworm rearing Pests and diseases of silkworm and their management – post cocoon technology – stifling to weaving. By products of sericulture - non –mulberry silkworms – eri, tasar and muga silkworms.

UNIT III

Apiculture - Bee species – comparison- castes of bees, bee behaviour and bee dance; Apiary management practices – bee pasturage, foraging, seasonal variations; Bee products, properties and uses; Effect of agricultural inputs on bee activity – pesticide poisoning; Lac insect- biology-strains-natural enemies of lac insect and lac products;

UNIT IV

Pests of vegetable crops – Distribution, bionomics, symptoms of damage and management strategies for insect, pest and integrated management of solanaceous, cucurbits, crucifers, root crops, leafy vegetables and bhendi

UNIT IV

Pests of fruit crops – Distribution, bionomics, symptoms of damage and management strategies for insect, pest and integrated management of mango, citrus, banana, guava, sapota, papaya, pomegranate, apple

PESTS OF HORTICULTURAL CROPS & PRODUCTIVE ENTOMOLOGY (PRACTICAL)

1. Morphology of mulberry plant – description – distinguishing characters of promising mulberry genotypes. Nursery bed preparation – care in selection of planting materials – Biofertilizer treatment in nursery.
2. Main field preparation – methods of planting, methods of irrigation - Identification of nutrient deficiency symptoms – corrective measures.
3. Identification of weeds – Herbicide application method. Pruning methods – leaf / shoot harvest–

preservation of leaves.

4. Identification of pests of mulberry and damage symptoms.
5. Identification of symptoms of diseases and nematodes of mulberry.
6. Morphology of silkworm – different stages – Identification of races by cocoon shape, colour and larval marking –Dissection of mouth parts and silk glands.
7. Rearing house and appliances – Methods of disinfection. Incubation of eggs – methods – Chawki rearing – brushing – feeding.
8. Silkworm rearing – shelf and shoot rearing – skill involved in brushing – feeding moulting care – bed cleaning – spacing – mountages — spinning and cocoon harvest.
9. Identification of pests and diseases of silkworm – damage – symptoms - Mass multiplication of hyperparasitoid.
10. Integrated Farm System with Sericulture in Integrated Farming system – Mechanization in sericulture.
11. Eri silkworm – morphology – food plants – methods of rearing – methods of spinning – Tasar silkworm – morphology – food plants – early and late instar larval rearing.
12. Apiculture - Bee species – comparison- castes of bees, bee behaviour and bee dance; Apiary management practices – bee pasturage, foraging, seasonal variations; Bee products – properties and uses; Effect of agricultural inputs on bee activity – pesticide poisoning;
13. Lac insect- biology-strains-natural enemies of lac insect and lac products;

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2020-21 Admitted Batch
III Year Semester – VI
PESTS OF HORTICULTURAL CROPS & PRODUCTIVE ENTOMOLOGY
MODEL QUESTION PAPER

SECTION – A

Answer any **FIVE** questions. Each question carries equal marks.

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SECTION – B

Answer **All** the questions. Each question carries **TEN** marks

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2020-21 Admitted Batch
III Year Semester – VI
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, Little Millet
4. Kodo Millet, Barn Yard Millet, Proso Millet and Foxtail Millet.
5. Red gram Bengal Gram, Green Gram, Black Gram, Soybean, Lab – Lab.
6. Groundnut, Sesame, Mustard.
7. Sunflower, Safflower.
8. Coconut And Oil palm
9. Cotton, Jute and Mesta
10. Sugarcane And Sugar Beet

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2020-21 Admitted Batch
III Year Semester – VI
BREEDING OF FIELD CROPS
MODEL QUESTION PAPER

SECTION – A

Answer any **FIVE** questions. Each question carries equal marks.

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SECTION – B

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III Year Semester – VI
PRODUCTION TECHNOLOGY FOR ORNAMENTAL CROPS MEDICINAL AND
AROMATIC PLANTS
(CREDITS 4+2=6)

UNIT - I

Importance and scope of ornamental crops and landscaping - Landscape uses of trees, shrubs and climbers. Principles of landscaping - Initial approach – Axis – Focal Point – Mass effect – Unity – Space – Divisional Lines – Proportion and Scale – Texture – Time and Light– Tone and Colour – Mobility – Rhythm – Balance – Contrast – Harmony- Vista – Style. Production technology of cut flowers under protected conditions -Rose – Introduction- origin and distribution- Classification- Species and varieties- Climate and soil requirements- Propagation – Rootstocks- Stock scion compatibility- Land preparation- planting- Manures and fertilizers- Cultural operations (pruning- pinching and mulching) harvesting- Post harvest management- Yield and rose bi-products.

UNIT – II

Gerbera - Introduction- Origin and distribution- Classification- Species and varieties- Climate and soil requirements- Propagation- Land preparation- Planting- Manures and fertilizers- Cultural operations -Defoliation- Soil loosening- Shading- use of growth regulators- Physiological disorders- Harvesting- Post harvest management and yield. Carnation - Introduction- Origin and distribution- Classification- Species and varieties- Climate and soil requirements- Propagation- Land preparation- Planting- Manures and fertilizers- Cultural operations- (Pinching and disbudding) use of growth regulators- Physiological disorders- Harvesting- Post harvest management and yield. Lilium and Orchids - Introduction- Origin and distribution- Classification- Species and varieties- Climate and soil requirements- Propagation- Land preparation- Planting- Manures and fertilizers- Cultural operations- Use of growth regulators- Physiological disorders- Harvesting- Post harvest management and yield.

UNIT – III

Production technology of cut flowers under open conditions - Gladiolus and Tuberose- Introduction- Origin and distribution- Classification of varieties- Species and varieties- Climate and soil requirements- Propagation- Land preparation- Planting- Manures and fertilizers- Cultural operations- Use of growth regulators- Physiological disorders- Harvesting- Post harvest management and yield. Chrysanthemum - Introduction- Origin and distribution- Classification- Species and varieties- Climate and soil requirements- Propagation- Land preparation- Planting, Manures and fertilizers- Cultural operations- Pinching and disbudding - Use of growth regulators- Harvesting- Post harvest management and yield. Loose flowers - Marigold and Jasmine under open conditions - Introduction- Origin and distribution- Species and varieties- F1 hybrids- Climate and soil requirements- Propagation- Land preparation- Planting- Manures and fertilizers- Cultural operations- Pinching and disbudding - Use of growth regulators- Harvesting- Post harvest management and yield

UNIT – IV

Medicinal plants – Scope and Importance – Production technology of Asparagus, Aloe, Costus - Botanical name – Family - Origin - Economic part - Introduction – Climate – Soil - Varieties – Propagation – Planting - Manuring - Irrigation - Intercultural operations - Harvesting - Yield. Periwinkle, Isabgol - Botanical name – Family - Origin - Economic part - Introduction – Climate – Soil - Varieties – Propagation – Planting - Manuring - Irrigation - Intercultural operations - Harvesting - Yield. Aromatic plants – Importance – Essential oil industry in India – Properties of essential oils – Production technology of Mint and Ocimum - Botanical name – Family - Origin - Economic part - Introduction – Climate – Soil - Varieties – Propagation – Planting - Manuring - Irrigation - Intercultural operations - Harvesting - Yield.

UNIT – V

Lemongrass, Citronella, Palmarosa - Botanical name – Family - Origin - Economic part - Introduction – Climate – Soil - Varieties – Propagation – Planting - Manuring - Irrigation - Intercultural operations - Harvesting - Yield. Geranium and Vettiver - Botanical name – Family - Origin - Economic part - Introduction – Climate – Soil - Varieties – Propagation – Planting - Manuring - Irrigation - Intercultural operations - Harvesting – Yield. Processing and value addition in ornamental crops and MAPs produce – Dry flower making - Extraction methods of essential oils.

References

1. Bose, T.K. 1999. *Floriculture and Landscaping*. Naya Prakash, Kolkatta.
2. Bose, T.K. and Yadav, L.P. 1992. *Commercial Flowers*. Naya Prakash, Kolkatta.
3. Randhawa, G.S. and Mukhopadhyaya, A. 1994. *Floriculture in India*. Allied Publishers Pvt. Ltd., New Delhi
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6. Kumar, N., Abdul Khader, J.B.M, Rangaswamy, P and Irulappan, I. 2004. *Introduction to Spices, Plantation Crops, Medicinal and Aromatic Crops*. Oxford and IBH publishing Co, New Delhi.

PRODUCTION TECHNOLOGY FOR ORNAMENTAL CROPS MEDICINAL AND AROMATIC PLANTS (PRACTICAL)

1. Identification of ornamental plants.
2. Identification of Medicinal and Aromatic Plants.
3. Nursery bed preparation and flower seed sowing.
4. Training and pruning of roses.
5. Planning and layout of ornamental garden.
6. Bed preparation and planting of Medicinal and Aromatic Plants.
7. Protected structures – Care and maintenance.
8. Intercultural operations in flowers crops.
9. Intercultural operations in Medicinal and Aromatic plants.
10. Harvesting and post harvest handling of cut and loose flowers.
11. Floral preservatives to prolong vase-life of cut flowers.
12. Drying / dehydration techniques for flower drying.

13. Processing of Medicinal and Aromatic Plants.
14. Extraction of essential oils.
15. Visit to commercial flower unit.
16. Visit to commercial MAP unit.

ANDHRA UNIVERSITY
B. Vocational course
AGRICULTURE
2020-21 Admitted Batch
III Year Semester – VI
PRODUCTION TECHNOLOGY FOR ORNAMENTAL CROPS MEDICINAL AND
AROMATIC PLANTS
MODEL QUESTION PAPER

SECTION – A

Answer any **FIVE** questions. Each question carries equal marks.

(5*5 = 25)

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8

SECTION – B

Answer **All** the questions. Each question carries **TEN** marks

(5*10 = 50)

- | | | |
|----|----|------|
| 1. | a) | |
| | | (OR) |
| | b) | |
| 2. | a) | |
| | | (OR) |
| | b) | |
| 3. | a) | |
| | | (OR) |
| | b) | |
| 4. | a) | |
| | | (OR) |
| | b) | |
| 5. | a) | |
| | | (OR) |
| | b) | |

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B. Vocational course
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III Year Semester – VI
PROJECT WORK-II
(CREDITS 0+4=4)

- | | |
|---------------------------------------|------------------|
| 1. Presentation of synopsis: | 20 Marks |
| 2. Desertation and evaluation: | 50 Marks |
| 3. Seminar : | 20 Marks |
| 4. Viva voice : | 5 Marks |
| 5. TOTAL MARKS : | 100 Marks |