BOARD OF STUDIES IN B.Voc HORTICULTURE
2019-2020

DEPARTMENT OF BOTANY, MICROBIOLOGY AND HORTICULTURE

SYLLABUS FOR B.Voc HORTICULTURE

Pithapur Rajahs Government College

Autonomous NAAC Re – accredited at A by NAAC (3.17 CGPA)

KAKINADA – 533 001, E.G.Dt., Andhra Pradesh

P R GOVERNMENT COLLEGE (AUTONOMOUS), KAKINADA, E.G.DT.

Department of Botany, Microbiology and Horticulture

The Board of Studies meeting for **Horticulture** subject during the academic year 2018-2019 is conducted at the Dept. of Botany and Microbiology on **November 2018** with Smt. P.Sara, Lecturer –in-Charge in the chair along with the following members.

Name, designation and address **Signature**

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1. **Principal:**
   Dr.C.Krishna
   P.R Government Degree College
   Kakinada-533001.

2. **Chair Person :**
   Smt P.Sara
   Lecturer in-Charge
   Dept. of Botany and Microbiology
   P.R.G.C.(A),
   Kakinada

3. **AdiKavi Nannyya University Nominee :**
   Dr. S. Sai Durga Prasad,
   Principal
   K.G.R.L College (A),
   Bhimavaram, West Godavari District
   Mobile: 9948411470
   E-Mail: durgaprasad23@gmail.com

4. **Members nominated by Executive council of the College :**
   a. **Member from Research Organisation:**
      Smt M Sailaja
      Horticulture officer, horticulture dept
      Kakinada-533001
      East Godavari District
      Mobile : 7995086765
      E-Mail : adhkakinada@gmail.com

   b. **Subject Expert 1 :**
      Prof. B.V.Raghava Rao
      Former Dean Horticulture
      Horticultural University
      Pedavegi

   c. **Subject Expert 2 :**
      Dr. Veerabramhachari,
      HOD of Biotechnology,
      Krishna University, Machilipatnam.
      Krishna District.
      Mobile : 7981386667
      E-Mail : veerabramha@gmail.com

Name, designation and address **Signature**

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d. Subject Expert 3 :

Dr. A.Srinivasa Rao, Lecturer in charge of Botany,
Govt Degree college, Mandapeta.
Mobile : 8309843949
E-Mail : drannabattulasrao@gmail.com

e. Alumni member :

Sri A.R.K.Sastry
Former JD BSI
Yechuri Towers
Kakinada

5. Members from the College:

a. Faculty member:

Mr Y.T.Rajesh, Guest faculty in Horticulture

b. Student members:

Ms.G.J. Sivani IHBC –EM

P.R.GOVERMENT COLLEGE (AUTONOMOUS), KAKINADA – 533 001, A.P.

The **Board of Studies in B.Voc Horticulture** for the academic year 2018- 2019 held in November 2018 in Dept. of Botany and Microbiology, PRGC(A), Kakinada.

AGENDA :

1. The board of studies of a department in the college shall:
   A) Prepare syllabus and various courses keeping in view the objectives of the college interest of the stake holders and national requirement for consideration and approval of the academic council.
   B) Suggest methodologies for innovative teaching and evaluation techniques.
   C) Suggest Panel of names to the academic council for appointment of examiners.
   D) Coordinate research, teaching, extension and other academic activities in the department/college.

The members of B.O.S in Horticulture discussed all the issues kept in agenda at length and taken following resolutions.

RESOLUTIONS:

1. Unanimously resolved to approve the curriculum for B.Voc (Horticulture)
2. Resolved to approve the core component (Horticulture domain) offered for the semesters I and II. The syllabus, Blue Prints of the question papers for both theory and practical are approved
3. It is resolved to stress upon the skill component of the core subject through vigorous practical/hands on training.
4. Resolved to approve the syllabus, blue prints of the question papers of both theory and practical's for Botany (Non core) during I and II semesters.

Smt P.Sara
Chair Person,
BOS in Horticulture
Lecturer In-Charge
Dept. of Botany & Microbiology
P.R.Govt. College (A), Kakinada

Dr. Veerabramhachari
HOD of Biotechnology
Krishna University
Machilipatnam
Krishna District

Dr.A.Srinivasa Rao
Lecturer in charge of
Botany,
Govt. Degree College,
Mandapeta

Smt M.Sailaja
Horticulture officer
Horticulture dept
Kakinada-533001
East Godavari District

Prof. B.V.Raghava Rao
Former Dean Horticulture
Horticultural University
Pedavegi

Dr. S. Sai Durga Prasad,
Principal
K.G.R.L College(A),
Bhimavaram,
West Godavari District

A.R.K.Sastry
Former JD BSI
Yechuri
Towers

S.No	CORE SUBJECTS		MARKS	CREDITS	NON-CORE SUBJECTS	MARKS	CREDITS	NSQF & NSDC LEVELS OF ASSESMENT (UGC)
1.	**I Year**	**Semester-I**						
	Core I	Fundamentals of horticulture	60	4	Botany I	50	2	Certificate
		Skill components	50	3	Practical I	50	2	
	Core II	Soil science and fertility management for horticultural crops	60	4	Chemistry I	50	2	
		Skill components	50	3	Practical I	50	2	
	Core III	Crop physiology of horticultural crops	60	4	General English	50	2	
		Skill components	50	3				
		Semester-II						
	Core IV	Plant propagation and nursery management	60	4	Botany II	50	2	Diploma
		Skill components	50	3	Practical II	50	2	
	Core V	Seed production technology of horticultural crops	60	4	Chemistry II	50	2	
		Skill components	50	3	Practical II	50	2	
	Core VI	Protective cultivation of horticultural crops	60	4	Environment studies	50	2	
		Skill components	50	3	CSS I	50	2	
2.	**II Year**	**Semester-III**						
	Core VII	Fruit crops production technology	60	4	Botany III	50	2	Advanced Diploma
		Skill components	50	3	Practical III	50	2	
	Core VIII	Vegetable crop production technology	60	4	Chemistry III	50	2	
		Skill components	50	3	Practical III	50	2	
	Core IX	Commercial floriculture	60	4	ICT	50	2	
		Skill components	50	3	CSS II	50	2	
		Semester-IV						
	Core X	Plantation crops and medicinal crops	60	4	Botany IV	50	2	

		Skill components	50	3	Practical IV	50	2	
	Core XI	Pests and disease management of horticultural crops	60	4	Chemistry IV	50	2	
		Skill components	50	3	Practical IV	50	2	
	Core XII	Basics of ornamental and landscape gardening	60	4	HVPE	50	2	
		Skill components	50	3	CSS III	50	2	
3.	**III Year**	**Semester-V**						
	Core XIII	Farm management and marketing	60	4	Soil Microbiology	50	2	
		Skill components	50	3	Practical	50	2	
	Core XIV	General principles of fruit and vegetable preservation	60	4	Chemistry V	50	2	
		Skill components	50	3	Practical V	50	2	
	Core XV	Organic forming	60	4	Botany V	50	2	
		Skill components	50	3	Practical V	50	2	
		Semester-VI						B.Voc Degree
	Core XVI	Recent advances in horticulture	60	4	Agricultural microbiology	50	2	
		Skill components	50	3	Practical VI	50	2	
	Core XVII	Post-harvest technology in horticultural crops	60	4	Botany VI	50	2	
		Skill components	50	3	Practical VI	50	2	
	Core XVIII	Project work	60	4	Chemistry VI	50	2	
					Practical	50	2	

Total Credits : 193
Total Marks : 3680

Index

B.voc Horticulture

HORTICULTURE

P.R. GOVERNMENT COLLEGE (A), KAKINADA

B. Voc (Horticulture)

SEMESTER-I CORE -I

FUNDAMENTALS OF HORTICULTURE

UNIT–I

Scope and importance of horticulture, Division of horticulture, classification of Horticultural plants, Brief note on some families of Horticultural importance. Agroecological regions of India, major Horticultural crops grown in different Agroecological regions of India.

UNIT-II

Tools, machinery and implements used in horticultural operations.

UNIT-III

Weed and water management in horticultural crops.
Weed – Definition, classification and characteristics of weeds. Principles and methods of weed management; preventive, cultural, mechanical, chemical, biological and alternate methods – IWM for horticultural crops – management of problematic, parasitic and aquatic weeds.
Irrigation methods – surface, sub-surface, and advance methods - drip, sprinkler and greenhouse and landscape irrigations.

UNIT-IV

Special cultural practices for horticultural crops – Training, Pruning, Staking, Pinching, Disbudding, Mulching, Trellising, Caging, Earthing up, Trenching and Raking.

PRACTICALS:

1. Study of tools and implements – their uses and identification
2. Study of different methods of Training and Pruning
3. Lay out of different irrigation systems
4. Mapping of horticultural zones of India and Andhra Pradesh
5. Explain about micro irrigation methods
6. Classification and identification of weeds
7. Practices of mechanical methods of weed control
8. Practices of manual methods of weed control
9. Identification of herbicides – and practicing herbicide application techniques.
10. Visit nearest micro irrigated field.

SUGGESTED READINGS

- Edmond, J.B., Senn, T. L., Andrews, F. S and Halfacre, R. G. 1963. Fundamentals of Horticulture. Tata Mac Graw Hill Publishing Co. New Delhi.
- Kumar, N. 1990. Introduction to Horticulture. Rajyalakshmi Publications Nagarcoil, Tamilnadu.
- ICAR. Hand Books of Horticulture

BLUE PRINT FOR QUESTION SETTER

UNIT NO.	ESSAY QUESTIONS 10 MARKS	SHORT ANSWER QUESTIONS 5 MARKS	VERY SHORT ANSWER QUESTIONS 2 MARKS	MARKS ALLOTED TO THE UNIT
UNIT – 1	2	1	2	29
UNIT-2	1	1	2	19
UNIT-3	1	2	2	24
UNIT-4	1	2	2	24
Total no.of Questions	5	6	8	
Total Marks including choice				96

P.R.GOVERNMENT COLLEGE (A), KAKINADA
B. Voc (Horticulture)
SEMESTER-I CORE -II

SOIL SCIENCE AND FERTILITY MANAGEMENT FOR HORTICULTURAL CROPS

UNIT-I

Soil – definition – components – pedology –Edaphology. Physical properties of soil – Colour, Texture, structure, Bulk density, Particle density, Pore space; soil water, soil air, soil temperature and their significance in crop production.

UNIT-II

Soil chemical properties – Soil reaction, EC and CEC. Soil Organic Matter and its importance on soil properties – Essential nutrients for crop plants - Major, secondary and micro nutrients – Soils of Andhra pradesh.

UNIT-III

Manures and fertilizers –Types – Straight, Complex, Compound, Mixed, Fortified and chelated fertilizers and their reactions in soil. Techniques to enhance fertilizer use efficiency.

UNIT-IV

Soil fertility – INM and IPNS – Problem soils – acid, saline and alkaline soils- their formation, reclamation and management

PRACTICALS

1. Study of different soils
2. Skill learning in soil sampling
3. Determination of soil texture by feel method
4. Determination of Bulk density, Particle density, Pore space by cylinder method.
5. Determination of soil moisture by oven dry method and soil pH and EC.
6. Identification of major and secondary nutrient deficiencies / disorders in crops.
7. Identification micronutrient deficiencies/ disorders in crops
8. Preparation of enriched FYM & MN mixtures
9. Visit to compost preparation unit
10. Visit to local problem soil areas

SUGGESTED READINGS

1. T. Biswas, M.S. Mukherjee 2001. A text book of Soil Science
2. www.icar.org.in
3. www.epa.gov

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UNIT NO.	ESSAY QUESTIONS 10 MARKS	SHORT ANSWER QUESTIONS 5 MARKS	VERY SHORT ANSWER QUESTIONS 2 MARKS	MARKS ALLOTED TO THE UNIT
UNIT – 1	02	01	02	29
UNIT -2	01	01	02	19
UNIT -3	01	02	02	24
UNIT -4	01	02	02	24
Total no.of Questions	**05**	**06**	**08**	
Total Marks	**Including**	**Choice**		**96**

P.R.GOVERNMENT COLLEGE (A), KAKINADA

B. Voc (Horticulture)

SEMESTER-I CORE -III

CROP PHYSIOLOGY

Unit –I Plant water relations

Importance of crop physiology in horticulture, role of water, water potential and components – Definitions –field capacity of soil and permanent wilting point, absorption and translocation of water and solutes, transpiration –significance – antitranspirants.

Unit –II Nutrio physiology

Mineral nutrition – mobility and mechanism of uptake – physiological role of nutrients, physiological disorders – nutritional disorders – difference between physiological and nutritional disorders – diagnosis, identification of disorders – foliar. Management techniques – foliar feeding, root feeding, trunk feeding and fertigation.

Unit –III Growth phyiology

Growth – growth analysis – LAI, LAD, SLW,SLA, LAR, NAR, RGR and CGR in relation to crop productivity. Photoperiodism, vernalisation, devernalisation. Role of plant growth regulators – their uses in crop productivity, post harvest physiology, physiology of seed.

Unit –IV Stress physiology

Environmental stresses – water stress, physiological changes- adaption to drought and its amelioration, temperature stress – physiological changes – low and high temperature – chilling injury – tolerance, low light and UV radiation stresses, physiological effect on crop productivity.

PRACTICALS

1. Measurement of plant water status by different methods.
2. Estimation of stomatal index and stomatal frequency.
3. Measurement of leaf area by different methods.
4. Physiological disorders in crop plants.
5. Nutritional disorders in crop plants.
6. Application of auxins to stem cuttings and observation on rooting studies.
7. Study on Delaying of fruit ripening by applications of gibberellins in fruit crops.
8. Study on applications of gibberellins in flower crops.
9. Study on the sex expression studies on vegetables by application of gibberellins.

SUGGESTED READINGS

1. Jain, J.K, 2007. Fundamentals of plant physiology, S. Chand & Co. Ltd, New Delhi.

2. http:/ /www.plantphys.org

3. http:/ /www.botany.org

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UNIT NO.	ESSAY QUESTIONS 10 MARKS	SHORT ANSWER QUESTIONS 5 MARKS	VERY SHORT ANSWER QUESTIONS 2 MARKS	MARKS ALLOTED TO THE UNIT
UNIT – 1	02	01	02	29
UNIT -2	01	01	02	19
UNIT -3	01	02	02	24
UNIT -4	01	02	02	24
Total no.of Questions	**05**	**06**	**08**	
Total Marks	**Including**	**Choice**		**96**

P.R.GOVERNMENT COLLEGE (A), KAKINADA
I B.Voc., HORTICULTURE SEMESTER-I,
MODEL QUESTION PAPER

Time: 3 hrs. **TITLE: ----------** **Marks: 60**

PART – 1

Note: Answer any <u>THREE</u> questions. Draw a neat labeled diagrams wherever necessary **3x10= 30**

1. Long answer question from UNIT-1
2. Long answer question from UNIT-2
3. Long answer question from UNIT-3
4. Long answer question from UNIT-4
5. Long answer question from any one of the UNIT

Part – II

Answer any **FOUR** Questions. Draw diagrams wherever necessary **4x5=20**

6. SAQ from UNIT-1
7. SAQ from UNIT-2
8. SAQ from UNIT-3
9. SAQ from UNIT-4
10. SAQ from UNIT-1
11. SAQ from UNIT-2
12. SAQ from UNIT-3
13. SAQ from UNIT-4

Part – III

Answer all **FIVE** Questions. **5x2=10**

14. VSAQ from UNIT-1
15. VSAQ from UNIT-2
16. VSAQ from UNIT-3
17. VSAQ from UNIT-4
18. VSAQ from any one of the UNIT

P.R.GOVERNMENT COLLEGE (A), KAKINADA

I B.Voc., HORTICULTURE SEMESTER-I,

PRACTICAL MODEL QUESTION PAPER

Time: 2 hrs. **TITLE: ----------** **Marks: 50**

A. Major experiment	:	1x10m	=	10marks
B. Minor experiment	:	3x6m	=	18marks
C. Spotters	:	6x2m	=	12marks
D. Record & Viva	:	5+5m	=	10marks

		Total	-	50marks

P.R.GOVERNMENT COLLEGE (A), KAKINADA
B. Voc (Horticulture)
SEMESTER-II CORE -IV
PLANT PROPAGATION AND NURSERY MANAGEMENT

UNIT – I

Propagation, Need and Potentialities for plant multiplication, sexual and asexual methods of propagation, advantages and disadvantages, Propagation by division – suckers, rhizomes, corms, tubers, cloves and bulbs.

UNIT – II

Methods of grafting – Approach grafting; Veneer grating; Wedge grafting; Saddle grafting; Tongue grafting; Whip grafting; Bridge grafting; Epi-cotyl grafting; Soft wood grafting. Methods of budding – 'T' budding, Inverted 'T' budding, Shield budding; Chip budding; Flute budding; Ring budding; 'I' budding. Selection of mother plant –Establishment of progeny orchard/mother plant block; - pre-curing of scion

Propagation by cutting – Hard wood, Semi-hard wood, Herbaceous – physiological and bio-chemical basis of rooting; Use of growth regulators in rooting of cuttings. Propagation by layering – types of layering; establishment of layers in the field; Use of growth regulators in layering

UNIT – III

Micro propagation – Choice of explant (totipotency); media-MS-media, Growth regulators in culture, sterilization of the explant, sub-culturing of the callus, Hardening of plants

UNIT – IV

Definition of a nursery, different types of nursery beds-flat beds, raised beds and sunken beds, their merits and demerits. Different nursery techniques and their management, Propagation structures: Mist chamber, humidifier, greenhouses, glasshouses, cold frames, hot beds and poly houses.

PRACTICALS

1. Study of various propagation media for nursery beds, pots and mist chamber.
2. Preparation of nursery beds (raised and flat beds) and sowing of seeds.
3. Raising of root stocks of different fruit plants like Mango, Citrus, Cashew etc.
4. Preparation of plant material for planting
5. Hardening of plants in the nursery – different methods like reducing Irrigation, Shade, exposure for short periods to sun etc.
6. Study and practicing of different propagation methods by cutting.
7. Study and practicing of different propagation methods by layering.
8. Study and practicing of different propagation methods by grafting
9. Study and practicing of different propagation methods by budding
10. Study and practicing of different propagation methods by divisions
11. Application of nutrients and plant protection chemicals in the nursery

SUGGESTED READINGS

- Garmer, R. J and Choudhri, S. A. 1972. Propagation of Tropical Fruit Trees. Oxford & IBH Publishing Co., New Delhi.
- Mukherjee, S. K and Majumder, P. K. 1973. Propagation of Fruit Crops. ICAR, New Delhi.
- Hartman, H. T and Kester, D. E. 1976. Plant Propagation – Principles and Practices Prentice Hall of India Pvt. Ltd. Bombay.
- Sadhu, M. K. 1996. Plant Propagation. New Age International Publishers, New Delhi.

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UNIT NO.	**ESSAY QUESTIONS 10 MARKS**	**SHORT ANSWER QUESTIONS 5 MARKS**	**VERY SHORT ANSWER QUESTIONS 2 MARKS**	**MARKS ALLOTED TO THE UNIT**
UNIT – 1	02	01	02	29
UNIT -2	01	01	02	19
UNIT -3	01	02	02	24
UNIT -4	01	02	02	24
Total no.of Questions	**05**	**06**	**08**	
Total Marks	**Including**	**Choice**		**96**

P.R.GOVERNMENT COLLEGE (A), KAKINADA
B. Voc (Horticulture)
SEMESTER-II CORE -V
SEED PRODUCTION TECHNOLOGY OF HORTICULTURAL CROPS

UNIT-I

Seed - definition - importance - quality characteristics - generation system – seed multiplication ratio –Seed production - importance - difference between seed and crop, production difference between variety and hybrid seed production - Basic principles of seed

UNIT - II

production in tropical vegetables -tomato, brinjal and chillies - bhendi and vegetable cowpea, lablab and cluster bean – some of cucurbitaceae crops. onion, amaranthus and moringa.
Seed production temperate vegetables in cabbage, cauliflower - carrot and beetroot - potato.Seed production in papaya and coconut .

UNIT - III

Seed production in spices - coriander and fenugreek. Flower crops - marigold, gampherina and cockscomb. Medicinal plants - ashwagandha , periwinkle and senna.

UNIT - IV

Seed certification - phases and procedures - Seed testing– principles and utility of seed testing.Seed Act and Rules and Seed law enforcement - duties and responsibilities of seed inspector.

PRACTICALS

1. Identification and study on seed structure in horticultural crops
2. Practicing emasculation and dusting techniques (tomato / brinjal /okra)
3. Studies on physiological and harvestable maturity in vegetable crops
4. Practicing different seed extraction methods
5. Practicing seed grading techniques
6. Practicing pre-storage seed treatment, packing materials and maintenance of seed godown
7. Visit to vegetable seed production plots and processing unit
8. Study on seed sampling, mixing and dividing
9. Conducting germination test and seedling evaluation
10. Practicing Quick viability test

SUGGESTED READINGS

1. Thompson, H. C and Kelly, W. C. 1959. Vegetable Crops. Tata Mc Graw Hill Publishing Co. Ltd., Bombay.
2. Bose, T. K et al. 2003. Vegetables Crops. Naya Udyog Publishers, Kolkata.
3. Shanmugavelu, K. G. 1989. Production Technology of Vegetable Crops. Oxford & IBH Publishing Co. Pvt. Ltd, New Delhi.
4. Choudhury, B. (ICAR). 1990. Vegetables. 8th Edition, National Book Trust, New Delhi.

P.R.GOVERNMENT COLLEGE (A), KAKINADA

B. Voc (Horticulture)

SEMESTER-II CORE -VI

GREENHOUSE MANAGEMENT

UNIT-I

Introduction to green houses – history – definition – greenhouse effect – advantages of green houses 114. Brief description of types of green houses – greenhouses based on shape, utility, construction, covering materials and cost, shade net.

UNIT – II

Plant response to greenhouse environments – light, temperature, relative humidity, ventilation and carbon dioxide and environmental requirement of agriculture and horticulture crops inside green houses.

Equipment required for controlling green house environment – summer cooling and winter heating, natural ventilation, forced ventilation and computers.

UNIT – III

Planning of green house facility – site selection and orientation, structural design and covering materials.

Greenhouse heating and distribution systems – greenhouse utilization – off-season drying of agricultural produce

UNIT – IV

Irrigation system used in greenhouses – rules of watering – hand watering, perimeter watering, overhead sprinklers, boom watering and drip irrigation. Threshing – types of threshers – parts – threshers for different crops –terminology.

PRACTICALS

1. Study of different types of green houses based on shape
2. Study of different types of green houses based on construction
3. Study of materials for construction of greenhouses
4. Study of construction of pipe framed green house
5. Measurement of environmental parameters inside greenhouse
6. Calculation of ventilation rates in active summer cooling system
7. Calculation of rate of air exchange in active winter cooling system
8. Study of different irrigation systems used in Greenhouse
9. Visit a nearest Greenhouse

SUGGESTED READINGS

- Aldrich, R.A and Bartok, J. W. 1990. Greenhouse Engineering. Ball Pub., USA.
- Nelson, P.V. 1991. Greenhouse Operation and Management. Ball Pub., USA.
- S. Prasad and Kumar, U. 2007. Green House Management For Horticulture Crops. Agrobios (India), Jodhpur.
- Radha Manohar, K and Igathinathane, C. 2000. Greenhouse Technology and Management. BS Publications, Hyderabad.

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UNIT NO.	ESSAY QUESTIONS 10 MARKS	SHORT ANSWER QUESTIONS 5 MARKS	VERY SHORT ANSWER QUESTIONS 2 MARKS	MARKS ALLOTED TO THE UNIT
UNIT – 1	02	01	02	29
UNIT -2	01	01	02	19
UNIT -3	01	02	02	24
UNIT -4	01	02	02	24
Total no.of Questions	**05**	**06**	**08**	
Total Marks	**Including**	**Choice**		**96**

P.R.GOVERNMENT COLLEGE (A), KAKINADA
I B.Voc., HORTICULTURE SEMESTER-II,

MODEL QUESTION PAPER

Time: 3 hrs. **TITLE: ----------** **Marks: 60**

PART – 1

Note: Answer any <u>THREE</u> questions. Draw a neat labeled diagrams wherever necessary **3x10= 30**

1.Long answer question from UNIT-1
2.Long answer question from UNIT-2
3.Long answer question from UNIT-3
4.Long answer question from UNIT-4
5.Long answer question from any one of the UNIT

Part – II

Answer any <u>FOUR</u> Questions. Draw diagrams wherever necessary **4x5=20**

6.SAQ from UNIT-1
7.SAQ from UNIT-2
8.SAQ from UNIT-3
9.SAQ from UNIT-4
10.SAQ from UNIT-1
11.SAQ from UNIT-2
12.SAQ from UNIT-3
13.SAQ from UNIT-4

Part – III

Answer all <u>FIVE</u> Questions. **5x2=10**

14.VSAQ from UNIT-1
15.VSAQ from UNIT-2
16.VSAQ from UNIT-3
17.VSAQ from UNIT-4
18.VSAQ from any one of the UNIT

P.R.GOVERNMENT COLLEGE (A), KAKINADA

I B.Voc., HORTICULTURE SEMESTER-II,

PRACTICAL MODEL QUESTION PAPER

Time: 2 hrs. **TITLE: ----------** **Marks: 50**

A. Major experiment	:	1x10m	=	10marks
B. Minor experiment	:	3x6m	=	18marks
C. Spotters	:	6x2m	=	12marks
D. Record & Viva	:	5+5m	=	10marks

		Total	-	50marks

P.R.GOVERNMENT COLLEGE (A), KAKINADA
B. Voc (Horticulture)
SEMESTER-III CORE -VII
FRUIT CROP PRODUCTION TECHNOLOGY

Unit –I

Definition – area and production of fruit crops in Andhra Pradesh – Orchard management – Definition- Selection and layout of orchard - Physical features in orchard, Planting systems.

Unit –II

Study of cultural practices of the following fruit crops, with reference to soil, climate, varieties, methods of propagation, nutrient, irrigation and weed management practices – training and pruning – role of growth regulators – maturity standards for harvesting – post harvest technology of fruit crops – yield – grading – packing – storage and value added products.

Unit –III

Production technology of following tropical fruits – Mango, Banana, Citrus, Papaya, Sapota, Guava.

Unit –IV

Production technology of following sub-tropical and temperate fruits – Pineapple, Apple, Pear, Almond - Organic fruit production.

PRACTICALS

1. Selection and layout of orchards and physical features in orchard
2. Different planting systems in fruit crops
3. Description and identification of varieties of Mango and Banana based on flower and Fruit morphology.
4. Description and identification of varieties of Citrus.
5. Description and identification of varieties of Papaya, Sapota, Guava and pine apple.
6. Description and identification of varieties of Pomegranate, Ber .
7. Training and Pruning of Mango, Guava and Citrus.
8. Pre-treatment of Banana suckers and desuckering in Banana
9. Manure & Fertilizer application including Bio-fertilizers in different fruit crops (Methods of application, calculation of the required Manure & Fertilizers based on the nutrient content).
10. Visit to commercial orchards.

SUGGESTED READINGS

- Bose, T.K and Mitra, S. K. 1990. Fruits Tropical and Subtropical. Naya Prakash, Calcutta.
- Ranjit Singh, 1992. Fruits. N.B.T., New Delhi.
- Chattopadhyay, T. K 1997. Text book on Pomology (Fundamentals of fruit growing). Kalyani Publishers, Hyderabad.
- Chandra, K. L. (ICAR) 2002, 2001. Hand book of Horticulture. ICAR, New Delhi.

BLUE PRINT FOR QUESTION SETTER

	ESSAY QUESTIONS	SHORT ANSWER QUESTIONS	VERY SHORT ANSWER QUESTIONS
UNIT -1	01	02	03
UNIT -2	02	02	03
UNIT -3	02	02	03
UNIT -4	01	02	03

P.R.GOVERNMENT COLLEGE (A), KAKINADA

B. Voc (Horticulture)
SEMESTER-III CORE -VIII
VEGETABLE CROP PRODUCTION TECHNOLOGY

UNIT-I

Scope and importance of vegetable cultivation – area and production in Tamilnadu – systems of vegetable cultivation – kitchen garden – truck garden and market garden – gardening for Processing.

UNIT-II

Climate – soil requirement –varieties / hybrids – seed rate – nursery practices – protray nursery – transplanting – manuring – irrigation –fertigation. Weeding –chemical –mechanical weed control – use of growth regulators- special horticultural practices(training, staking, pruning) – physiological disorders, nutrient deficiency and their corrective measures– Maturity indices-harvesting – grading, sorting – packing and storage and yield .

Production technology of the following crops: Tomato, Brinjal, Chillies, Bhendi, Onion,Beans

UNIT-III

Production technology of the following crops: bitter gourds – Ridge gourds –Snake gourds - pumpkin - Water melon - Cabbage – Cauliflower.

UNIT-IV

Production technology of the following root crops Radish – Carrot, Yam,Alocasia,Potato

Leafy vegetables : Amaranthus – Moringa – Palak

PRACTICALS

1. Layout of kitchen garden
2. Classification of vegetable crops
3. Nursery techniques for vegetable production and Hi-tech vegetable nursery production
4. Identification and description of Solanaceous vegetable varieties
5. Methods of main field preparation and transplanting of nursery grown seedlings
6. Nutritional deficiencies and physiological disorders in tropical and sub tropical vegetables
7. Identification and description of Okra and Legume vegetables
8. Identification and description of varieties of cucurbits
9. Harvesting indices and maturity standards in tropical vegetables
10. Visit to vegetable farmers fields, Visit to vegetable markets for study of marketing problems

SUGGESTED READINGS

- Thompson, H. C and Kelly, W. C. 1959. Vegetable Crops. Tata Mc Graw Hill Publishing Co. Ltd., Bombay.
- Premnath Velyudhan, S and Singh, D. P. 1987. Vegetables for the Tropical Region ICAR, New Delhi.
- Shanmugavelu, K. G. 1989. Production Technology of Vegetable Crops. Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi.
- Chaudhary, B. 1992. Vegetables. National Book Trust, New Delhi.

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UNIT -4	01	02	03

P.R.GOVERNMENT COLLEGE (A), KAKINADA

B. Voc (Horticulture)

SEMESTER-III CORE -IX

COMMERCIAL FLORICULTURE

Unit-I

Scope and importance of commercial floriculture in India. Present status, Future prospects and strategies needed for improvement. Area, production and exports.

Unit-II

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, and yield.
Production technology : Rose, Jasmine, Tuberose, Chrysanthemum, Marigold, Crossandra.

Unit-III

Introduction to protected structures for cut flower production –Study of cut flower, production technology of Carnation, Gerbera, Anthurium, Gladiolus

Unit-IV

Post harvest management of cut flowers – Floral decorations, bouquets and dry flowers – Grading, packing and marketing of flowers.

PRACTICALS

1. Propagation methods in chrysanthemum
2. Preparation of nursery bed for flower seeds sowing.
3. Identification of important flower crops and their varieties
4. Training and Pruning of Roses in open and polyhouses
5. Propagation of rose by cutting and budding
6. Layering methods for Jasmine propagation
7. Practices in post harvest management of cut flowers (pre cooling, grading, pulsing, storage, packing and marketing of cut flowers)
8. Field visit to commercial flower growing area

SUGGESTED READINGS

- Randhawa, G. S and Mukhopadhyaya, A. 2004. Floriculture in India. Allied Publishers Pvt. Ltd., New Delhi.
- Bose, T. K and Yadav, L. P. 1989. Commercial Flowers. Nayaprakash, Calcutta.
- Pal, B.P. 1991. The Rose in India. Publications and Information Division ICAR, New Delhi.
- Aora, J. S. 2006. Introductory Ornamental Horticulture. Kalyani Publishres, Ludhiana – 141 008.

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UNIT -2	02	02	03
UNIT -3	02	02	03
UNIT -4	01	02	03

P.R.GOVERNMENT COLLEGE (A), KAKINADA
I B.Voc., HORTICULTURE SEMESTER-III,
PRACTICAL MODEL QUESTION PAPER

Time: 2 hrs. **TITLE: ----------** **Marks: 50**

A. Major experiment	:	1x10m	=	10 marks
B. Minor experiment	:	3x6m	=	18 marks
C. Spotters	:	6x2m	=	12 marks
D. Record & Viva	:	5+5m	=	10 marks

		Total	-	50 marks

P.R.GOVERNMENT COLLEGE (A), KAKINADA
I B.Voc., HORTICULTURE SEMESTER-III,

MODEL QUESTION PAPER

Time: 3 hrs. **TITLE: ----------** **Marks: 70**

PART – 1

Note: Answer any <u>THREE</u> questions. Draw a neat labeled diagrams wherever necessary **3x10= 30**

1. Long answer question from UNIT-1
2. Long answer question from UNIT-2
3. Long answer question from UNIT-3
4. Long answer question from UNIT-4
5. Long answer question from any one of the UNIT

Part – II

Answer any <u>FOUR</u> Questions. Draw diagrams wherever necessary **4x5=20**

1. SAQ from UNIT-1
2. SAQ from UNIT-2
3. SAQ from UNIT-3
4. SAQ from UNIT-4
5. SAQ from UNIT-1
6. SAQ from UNIT-2
7. SAQ from UNIT-3
8. SAQ from UNIT-4

Part – III

Answer any TEN Questions **10x2=20**

1. VSAQ from UNIT-1
2. VSAQ from UNIT-2
3. VSAQ from UNIT-3
4. VSAQ from UNIT-4
5. VSAQ from UNIT-1
6. VSAQ from UNIT-2
7. VSAQ from UNIT-3
8. VSAQ from UNIT-4
9. VSAQ from UNIT-1
10. VSAQ from UNIT-2
11. VSAQ from UNIT-3
12. VSAQ from UNIT-4

P.R.GOVERNMENT COLLEGE (A), KAKINADA
B. Voc (Horticulture)
SEMESTER-IV CORE -X
MEDICINAL AND PLANTATION CROPS

PLANTATION CROPS

Unit-I

Production technology of following crops:

Coconut: Uses, Varieties- Tall x dwarf hybrids (TxD), Dwarf x tall hybrids (DxT), Tall x tall hybrids (T x T). Soil, Climate, Propagation – Seed propagation, Selection of seed nuts, selection of seedling for planting. Preparation of pits and planting, Irrigation, Manuring and fertilization, methods of application of fertilizers, weeding. Harvesting, Yield, Storage.

Oil Palm: Introduction, uses, varieties, seed propagation, Climate – Sunshine and Temperature requirement Types of soils for oil palm growing regions, Spacing, Planting, Irrigation, Manuring, Weeding and Mulching Harvesting and yield

Cocoa: Introduction, products/Byproducts chocolate, varieties, Climate, Soil, Seed and Vegetative propagation, Cuttings, preparation of land, provision of Shade, Spacing, planting-Cocoa under Natural Shade, Intercropping Irrigation, Manuring, weeding, types of branching, training and pruning, Harvesting.

Unit-II

Cashew Nut: Introduction, uses, Climate, Soils, varieties/ hybrids, Propagation – Vegetative propagation, Epi-cotyl grafting and Cuttings. Planting, Branching Pattern, Irrigation, weeding, Manuring, Training and pruning, Rejuvenation, flowering, Harvesting, Yield.

Coffee: Introduction, soil, Climate, types- differences Arabica/robusta, branching, varieties, propagation, Raising nurseries. Preparation of main field and planting, Provision of shade, Advantages of shade, Disadvantages of shade, Irrigation, Manuring, Training and pruning – Trenching, Mulching, Weeding, Liming, Flowering- season of flowering, Fruit set and harvesting and Yield.

MEDICINAL PLANTS

Unit-III

Aloe: Importance and uses, description of plant, species and varieties, soil, climate, land preparation, propagation crop duration, spacing & planting, manuring, irrigation, inter-cultivation, harvesting, yield and chemical composition.

Rauvolfia, Morinda: Importance and uses, botany, varieties, soil, climate propagation spacing, planting, manuring, irrigation, weeding, harvesting, root yield.

Aswagandha: Importance and uses, description of plant, varieties, soil, climate, propagation manures, fertilizers and inter cultivation Harvesting, crop duration, method of harvesting drying, grading and yield, chemical constituents.

Unit-IV

Citronella & Lemongrass: Importance and uses, botany, varieties, soil, climate, land preparation, propagation, spacing, planting, manures and fertilizers, irrigation, interculture, harvesting & yield of herb and oil.

Mint: Importance and uses, distribution, description of species of mint, varieties, chemical composition and uses, seasons, soil, climate, land preparation, propagation, spacing, planting, manures and fertilizers, irrigation, interculture, harvesting & yield.

PRACTICALS

1. Description and identification of coconut, &oil palm varieties/ Hybrids
2. Layout and planting of coconut, oil palm.
3. Description and identification of cacao varieties/ Hybrids.
4. Selection of mother palm, seed nuts and planting of seed nuts in the nursery of coconut.
5. Visit of commercial plantations in the district
6. Collection of locally available medicinal plants, plant description
7. Propagation techniques for two important medicinal plants
8. Important cultural aspects and harvesting techniques for important medicinal plants.
9. Visit to nearest medicinal garden
10. Preparation of herbarium of locally available medicinal plants

SUGGESTED READINGS

- Kumar, N.B., Md Abdul khaddar, M., Ranga swamy, P and Iruiappan, I. 1997. Introduction To Spices, Plantation Crops And Aromatic Crops. Oxford & IBH, New Delhi.
- Shanmugavelu, K. G. Kumar, N and Nad Peter, K.V. 2005.
- Production Technology of Spices and Plantation Crops. Agrosis, Jodhpur.
- Jain, S. K. 1983. Medicinal plants. National Book Trust, New Delhi. Dastur J F 1982. Medicinal plants of India and Pakistan. Taraporevala sons and Co. Pvt. Ltd., Bombay.
- Atal, E. K and Kapur, B. M. 1982. Cultivation and Utilization of medicinal and aromatic plants. CSIR, New Delhi.

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UNIT -3	02	02	03
UNIT -4	01	02	03

P.R.GOVERNMENT COLLEGE (A), KAKINADA

B. Voc (Horticulture)
SEMESTER-IV CORE -XI
PEST AND DISEASE MANAGEMENT OF HORTICULTURAL CROPS

UNIT-I

Pest - categories – causes for pest for outbreak. Pest management - principles and components .Natural enemies in pest suppression.

UNIT-II

IPM – Management strategies for important insect pests groups – chewing insects - stem borers – fruit borer – sap feeders of important fruit, vegetable, spices, medicinal and plantation crops- Special pest management strategies in ware house, green house, poly house. Management techniques for plant parasitic nematodes.

UNIT-III

Etiology, symptoms and integrated management of important diseases due to fungi, bacteria, viruses, phytoplasma, phanerogamic parasites of the following horticultural crops.

UNIT-IV

Pest and disease management of the following crops:

Fruits: : Mango, Banana,, Pomegranate, Papaya, Apple.
Vegetables: : Brinjal, Tomato, Bhendi, Cucurbits, Crucifers, Potato

Plantion crops: Coconut, Oilpalm,Cocoa,Coffee.

Flower crops: Rose,chrysanthemum, Antherium,Gerbera.

PRACTICALS

1. Identification of various insect groups inimical to horticultural crops.
2. Insect pests of Mango, Papaya, Citrus, Banana and their management
3. Insect pests of Coconut, Cocoa, Oil palm and their management
4. Insect pests of Brinjal, Chillies , Tomato and their management
5. Insect pests of flowers – Rose Jasmine. Chrysanthemum, Marigold, Crossandra and their management
6. Etiology, symptoms and management of diseases - Mango and Banana, Papaya, Citrus
7. Etiology, symptoms and management of diseases - Coconut , Cocoa , Oil palm
8. Etiology, symptoms and management of diseases - Tomato, Brinjal and Chilli
9. Etiology, symptoms and management of diseases - Rose, Jasmine, Chrysanthemum, Marigold
10. Visit the nearest field to identify the diseases and pests

SUGGESTED READINGS

1. David, B. V. and Kumaraswamy, T. 1978. Elements of Economicf Entomology. Popular Book Depot. Madras.
2. Butani, D. K. 1984. Insects and Fruits. Periodical Expert Book Agency, New Delhi.
3. Mehrotra, R. S. Plant Pathology. Tata McGraw-Hill Publishing Company, New Delhi.
4. Rangaswamy, G and Bagyaraj, G. J. Agricultural Microbiology. Prentice – Hall of India, Pvt. Ltd. New Delhi.

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UNIT -4	01	02	03

P.R.GOVERNMENT COLLEGE (A), KAKINADA
B. Voc (Horticulture)
SEMESTER-IV CORE -XII
BASICS OF ORNAMENTAL AND LANDSCAPE GARDENING

Unit – I

Scope and importance of ornamental gardening and landscaping –principles – formal and informal garden – Styles of garden - Features of garden - Garden components and adornments – plant Components - edges, hedges, flower beds, trophy, topiary, mixed borders - non plant components - garden walls, fencing, steps, garden drives and paths, pavements, fountains, arches, pergolas, trellises, pools, etc.

Unit – II

Operations in maintenance of trees, annuals, shrubs, climbers, creepers, herbaceous perennials, ferns, cacti and succulents, palms and cycads – sunken garden, roof garden, rockeries.

Unit – III

Operations in planting and maintenance of public garden, institutional garden, Industrial garden, residential complex garden - Operations in landscape maintenance for high ways, bus terminus, airports, city roads and IT parks.

Unit – IV

Lawn – types of lawn grasses – criteria for selection- methods of lawn establishment - operation and maintenance – problems and remedial management – flower arrangements and dry flowers – suitable plant spp. and methods.

PRACTICALS

1. Identification and description of annuals.
2. Identification of Herbaceous perennials.
3. Identification of climbers, creepers, foliage and flowering shrubs.
4. Identification of avenue trees, palms and ferns.
5. Identification of ornamental grasses cacti and succulents.
6. Study of water garden, terrace garden and Japanese gardens, recreational and children's corner.
7. Study of planning, designing of gardens and layout.
8. Study of components of a garden and functional uses of plants in the landscape.
9. Study of planning and designing of house garden, roadside planting and avenues for new colonies, traffic islands.
10. Visit to nearby landscape garden layout.

SUGGESTED READINGS

1. Randhawa, G S. Ornamental Horticulture in India
2. Davidson Peterson and Marklenbug. Nursery Management
3. Randhawa, G. S. Amitabha Mukhopadhyay. 2004. Floriculture in India. Allied Publishers Pvt. Ltd., New Delhi.
4. Bose, T. K and Mukherjee, D. 2004. Gardening in India. Oxford & IBH Publishers.

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P.R.GOVERNMENT COLLEGE (A), KAKINADA
I B.Voc., HORTICULTURE SEMESTER-IV,
PRACTICAL MODEL QUESTION PAPER

Time: 2 hrs. **TITLE: ----------** **Marks: 50**

A. Major experiment	:	1x10m	=	10marks
B. Minor experiment	:	3x6m	=	18marks
C. Spotters	:	6x2m	=	12marks
D. Record & Viva	:	5+5m	=	10marks

		Total	-	50marks

P.R.GOVERNMENT COLLEGE (A), KAKINADA
B. Voc (Horticulture)
SEMESTER-V CORE -XIII
FARM MANAGEMENT AND MARKETING

Unit I: Farm Management -Nature and Scope

Farm Management- meaning and scope of Farm Management –relationship with other sciences-Economic principles applied to the organization of farm business-principles of variable proportionsDetermination of optimum input and optimum output-Principle of Factor substitution-principle of product substitution -Law of Equi-marginal returns-Opportunity cost principle-Time comparison principle.

Unit II: Farm planning and Budgeting

Types and system of farming-Farm planning-Meaning-Need for farm planning-Types of Farm plans-simple farm plan and whole farm plan-characteristics of a good farm plan-basic steps in farm planning-Farm budgeting –meaning-types of farm budgets –Enterprise budgeting-Partial budgeting and whole farm budgeting.

Unit III: Farm Risk Management

Distinction between risk and uncertainty - sources of risk and uncertainty-production and technical risks- price risk-financial risk-methods of reducing risks.

Unit IV: Agricultural/Horticultural Marketing – Nature and Scope

Concepts and definition of marketing-scope of agricultural marketing-classification of marketsStructure, conduct-performance-market forces-demand and supply-characteristics of agricultural commodities-marketing costs and marketing margins-price spread. Marketed and marketable surplus.

PRACTICALS

1. Visit to a farm (government/ private/ corporate) to study the layout and organization
2. Visit to farm households-collection of data on cost of cultivation
3. Cost concepts -computation
4. Depreciation-methods of computing depreciation
5. Preparation of farm plans and budgets
6. Farm visit to collect information on marketing practices and marketing problems
7. Visit to village shandies/ vegetable market/ farmers markets
8. Visit to wholesale markets/commission mundies for horticultural crops
9. Visit to AGMARK laboratories/ grading centres/cold storage

SUGGESTED READINGS

- S.S Johl, J.R.Kapur,2006, Fundamentals of Farm Business Management:, Kalyani Publishers New Delhi.
- S.S Acharya and N.L.Agarwal, 2004, Agricultural Marketing in India, Oxford & IBH Publishing Company, New Delhi.

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P.R.GOVERNMENT COLLEGE (A), KAKINADA
B. Voc (Horticulture)
SEMESTER-V CORE -XIV
GENERAL PRINCIPLES OF FRUITS AND VEGETABLES PRESERVATION

Unit I:
Importance of fruit and vegetable preservation-Definition of preservation- Classify the different Methods of preservation.

Unit II:

Principle of preservation-prevention of microbial decomposition-prevention of self decomposition by enzymes-prevention of damage by insects, rodents, animals etc. Principles and method of preservation. Preservation by Asepsis, High Temperature, low temperature, chemicals-Drying, filtration, carbonation, sugar salt, fermentation, acids, oil and spices, antibiotics, irradiation

Unit III:

Unfermented fruit beverages: Preparation and preservation of unfermented fruit beverages juices, RTS, Nectar, cordial, squash, syrup, crush.

Jams, jellies and Marmalades – Procedure for preparation. Jams: Problems of Jam production. Jelly: Important considerations in jelly making and problems of jelly preparations

Unit IV:

Preparation of sauces and ketchups, pickle, salads.

Causes of spoilage of fruits and vegetables.

Food laws: Fruit Product order-Food Standardization and Regulatory agencies in India

PRACTICALS

1. Preparation of syrups and brines
2. Preparation of Jams
3. Preparation of Jellies and marmalades
4. Preparation of RTS/ Squash/syrup
5. Preparation of Candies and preserves
6. Dehydration of Fruits and vegetables
7. Preparation of Pickles (Hot and sweet)
8. Preparation of Sauces
9. Preparation of Ketchups
10. Visit to Processing units

SUGGESTED READINGS

1. **Desrosier, N. W. 1959. The Technology of Food Preservation AVI Publishing Co., Inc., Connecticut, USA.**
2. **Hulme, A. C. 1970. The Biochemistry of Fruits and their Products. Academic Press, London.**
3. **Lal, G., Siddappa, G. S and Tadon, N. G. L. 1986. Preservation of Fruits and Vegetables ICAR, New Delhi.**

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P.R.GOVERNMENT COLLEGE (A), KAKINADA
B. Voc (Horticulture)
SEMESTER-V CORE -XV
PROJECT

1. Nursery visits
2. Field visits.
3. Agricultural farming
4. Documentation on Gardening
5. Methods of quarentine
6. Preparation of seedlings

P.R.GOVERNMENT COLLEGE (A), KAKINADA

I B.Voc., HORTICULTURE SEMESTER-V,

PRACTICAL MODEL QUESTION PAPER

Time: 2 hrs. **TITLE: ----------** **Marks: 50**

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C. Spotters	:	6x2m	=	12 marks
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P.R.GOVERNMENT COLLEGE (A), KAKINADA

B. Voc (Horticulture)
SEMESTER-VI CORE -XVI
RECENT ADVANCES IN HORTICULTURE

Unit-I

Watershed management objectives, approaches, steps in watershed development. Importance and principles of organic farming in horticultural crops, sources and importance of organic matter.

Unit-II

Flower arrangement – Ikabana & western trend, Principles of flower arrangement, tools & equipment, dehydrated flowers, dehydration methods, maintenance of flower shape, procedure for embedding, pot –pourri.

Unit-III

Bonsai – Suitable plants for Bonsai; Aesthetics with plant parks, classification of Bonsai, requirements of Bonsai pot, Training and pruning, potting & repotting, general care.

Terrarium culture.

Unit-IV

Apiculture, bee-keeping flora in India, bee-keeping technology, equipment, Honey extraction.

Mushroom production nutritional aspects, recipes. Home scale industry prospects

PRACTICALS

1. Visit to Mushroom production unit.
2. Classification of Bonsai and Steps of growing a Bonsai.
3. Flower arrangement in different styles.
4. Preparation of bouquets.
5. Terrarium Culture.
6. Visit to Apiculture unit.

7. Visit to Drip-Micro irrigation project areas of horticultural farms
8. Visit to local vermin-compost unit.
9. Visit to watershed management centre.

SUGGESTED READINGS

1. Neol Kings bury, 1997. The ultimate planting guide.
2. Chada, K. L and Grewal, J. S. Advances in Horticulture Volume 2,3,4,6 and 12. ICAR, Malhotra Publishing House, New Delhi.
3. Sharma, V. K. Advances in Horticulture. Deep & Deep Publication Pvt. Limited, New Delhi, India.

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P.R.GOVERNMENT COLLEGE (A), KAKINADA

B. Voc (Horticulture)
SEMESTER-VI CORE -XVII
POST HARVESTING TECHNOLOGY OF HORTICULTURAL CROPS

Unit-I

Importance of Post harvest technology of horticultural crops-post harvest losses in the country-Loss of revenue in the country. Physiological and Biochemical changes: Physiological – Softening, Physiological loss in weight (PLW), texture, respiration and transpiration, Bio-chemical changes – Change in carbohydrates, organic acids, pigments, phenolic compounds, flavouring compounds, enzyme activity.

Study of Maturity – definition of maturity, different methods of judge maturity in horticultural crops like Mango, Banana, Citrus, Papaya, Brinjal, Tomato, Bhendi, coconut, oil palm.

Unit-II

Physico-chemical changes during development, ripening, storage of fruits and vegetables. Methods of storage and transportation of horticultural crops

Study of Harvesting, grading, packaging and storage of Fruit crops like Mango, Banana, Citrus, Papaya.

Unit-III

Study of Harvesting, grading, packaging and storage of vegetable crops like Brinjal, Tomato, Bhendi, Onion, melons and pumpkin.

Study of Harvesting, grading, packaging and storage of plantation crops like coconut, cashew, coffee, oil palm.

Unit-IV

Study of Harvesting, grading, packaging and storage of medicinal crops like Rauvulfia, Cinchona, Senna.

Study of Harvesting, grading, packaging and storage of flower crops like Roses, gladiolus, gerbera, chrysanthemum.

PRACTICALS

1. Practice in judging the maturity of various horticultural produce
2. Determination of physiological loss in weight and quality
3. Grading of horticultural produce
4. Packing studies in fruits, vegetables by using different packing material
5. Packing studies in plantation crops and cut flowers by using different packing material
6. Methods of storage
7. Methods of transportation
8. Identification of storage pests and diseases
9. Visit to markets, packing houses and cold storages
10. Packing studies in plantation crops and cut flowers by using different packing material

SUGGESTED READINGS

1. Venkatarathnam, L. 1988. Packaging of Fruits and Vegetables in India Agri-Horticultural Society, Hyderabad.

2. Salunkhe, D. K., Bhatt, N. R and Desai, B. B. 1990. Post harvest Biotechnology of Flowers and

Ornamental Plants. Nayaprakash, Calcutta.

3. Pandey, P. H. 1998. Principles and Practice of Post Harvest Technology. Kalyani Publishers, Ludhiana.

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P.R.GOVERNMENT COLLEGE (A), KAKINADA
B. Voc (Horticulture)
SEMESTER-VI CORE -XVIII
ORGANIC FARMING

UNIT-I

A. What is Organic Farming?

B. Why Organic Farming?

Detrimental effects of currently chemical dependent farming.

i) Reduction of crop production due to depletion of soil Health.
ii) Pesticide contamination and human health hazard.
iii) Contamination of food products by pesticides & chemicals.
iv) Environmental (soil, water, air) pollution.
v) Reduction of natural enemies of crop pests.
vi) Threat to Bio diversity.

i) Historical development of Organic Agriculture in India.
ii) Present status of Organic farming in Andhra Pradesh.

UNIT-II

Types of Farming (Advantage & disadvantage of each system);

- Pure Organic Farming – Definition, Concept & Benefits
- Integrated Farming system (Combination of Organic and Inorganic)
- Mixed Farming
- Inter cropping

Organic Farming (Process):

- Concept of farming system
- Developing organic farms
- Important steps & methods

UNIT-III

Sources of nutrients for Organic farming

- Organic Manure
  - FYM/Rural compost, City compost, Oil cakes,
  - Animal wastes, Vermi composts, etc
  - Characterization and Nutrients content of the above sources
- Green Manure
- Liquid Manure
- Bio fertilizers

UNIT-IV

Plant Protection Measures:

- Integrated pest & disease managements.

- Organic pesticides, bio-pesticides.
- Inorganic pesticides, disadvantages of their use.
- Seed, seedling and soil Treatment measures.
- Feasibility of complete dependence on organic sources

Organic Agri-Horticulture in Urban & Semi urban areas.

Quality Control and certification procedures of Organic products.

PRACTICALS

1. Selection of soil and soil conditioners
2. Preparation of FYM / Rural compost / Vermi compost
3. Preparation of seed bed & raising of seedlings
4. Land preparation
5. Raising of seedlings in pots or seed pans
6. Undertaking pot / container culture of flowers, vegetables, fruit plants
7. Practice training on interculture operations
8. Visit to near Organic Farming at farmer fields

SUGGESTED READINGS

1. Steve Gilman. Organic soil fertility management.
2. Sapna E. Thottathil. India's Organic Farming Revolution.
3. Pradyumna Tripathy and Umesh Thapa. Organic Farming in India.

BLUE PRINT FOR QUESTION SETTER

	ESSAY QUESTIONS	SHORT ANSWER QUESTIONS	VERY SHORT ANSWER QUESTIONS
UNIT -1	01	02	03
UNIT -2	02	02	03
UNIT -3	02	02	03
UNIT -4	01	02	03

P R GOVERNMENT COLLEGE (A), KAKINADA
I B.Voc., HORTICULTURE SEMESTER-VI,
PRACTICAL MODEL QUESTION PAPER

Time: 2 hrs. **TITLE: ----------** **Marks: 50**

A. Major experiment :	1x10m	= 10marks
B. Minor experiment :	3x6m	= 18marks
C. Spotters :	6x2m	= 12marks
D. Record & Viva :	5+5m	= 10marks

Total - 50marks

BOTANY

P.R.Government College (A)

I BSC B.Voc (Horticulture)/Semester End

Botany (Noncore) Syllabus., Semester – 1

Total – 2 Hrs /week **credits-2**

Systematic and Economic Botany of Horticulture plants

Unit-1

1. Fundamental components of Taxonomy (Identification, nomenclature, classification)
2. Taxonomic resources-Herbarium,botanical gardens,keys
3. ICBN- principles, Rules
4. Bentham and Hooker's system of classification; Concepts of APG

Unit -2 Systematic Botany of Horticultural plants and their economically useful parts in the families :

a. Anacardiaceae b. Rutaceae c. Musaceae d. Moraceae, e. Vitaceae, f. Caricaceae g. Euphorbiaceae g. Myrtaceae h. Sapotaceae i. Bromeliaceae j. Punicaceae k. Annonaceae l. Rhamnaceae and m. Rosaceae

Unit -3 Systematic Botany of Horticultural plants and their economically useful parts in the families :

a. Solanaceae b. Malvaceae c. Cucurbitaceae d.Moringaceae e.Fabaceae f. Liliaceae g. Brassicaceae h. Chenopodiaceae, i. Amaranthaceae, j. Convolvulaceae k. Araceae l. Dioscoreaceae

Unit -4 Systematic Botany of Horticultural plants and their economically useful parts in the families :

a. Piperaceae b.Zingiberaceae c.Orchidaceae d.Apiaceae e.Myristicaceae f.Lauraceae g.Leguminosae h.Caesalpiniaceae, i.Camelliaceae j.Rubiaceae, k.Arecaceae l.Sterculiaceae

Unit -5 Systematic Botany of Horticultural plants and their economically useful parts in the families :

a.Oleaceae b. Asteraceae c. Amaryllidaceae, d. Acanthaceae, e. Caryophyllaceae, f. Iridaceae, g. Apocynaceae, h. Poaceae i. Geraniaceae, j. Lamiaceae k. Scrophulariaceae.

P.R.Government College (A)

I BSC B.Voc (Horticulture)/Semester End

Botany (Noncore) Semester – 1

Systematic and Economic Botany of Horticulture plants

Model Question paper

Max . time : 2 hrs **Max . marks : 50 marks**

Section A

Answer to all of the following **4x2=8M**

1. Couplet
2. Phylogenetic classification
3. Any two ornamental plants in Asteraceae
4. Binomial nomenclature

Section –B

Answer any three of the following 3x4=12M

1. Herbarium
2. Natural system of classification
3. Economic importance of Fabaceae
4. Floral characters of Orchidaceae
5. Explain about Cultivation of ornamental of plants

Section –C

Answer any three of the following **3x10=30M**

1. Explain about rules, and Principals of ICBN

2. Explain Bentham and Hooker classification and give its merits and demerits

3. Family description and economic importance of Rutaceae

4. Family description and economic importance of asteraceae

5. Describe the cultivation practices of cauliflower

P.R.Government College (A)

I BSC B.Voc (Horticulture)/Semester End

Botany (Noncore) Practical Syllabus., Semester – 1

Systematic and Economic Botany of Horticulture plants

1. Systamtic study of locally available plant belonging to the described theory syllabus
2. Demonstration of families : Annonaceae , fabaceae , Solanaceae
3. Demonstration of families ; cucurbitacese , Rosaceae
4. Demonstration of families ; Asteraceae, Apiaceae
5. Demonstration of families: Orchidaceae
6. Gymnosperms Coniferopsida
7. Demonstration of Herbarium techniques
8. Field visits , study of local flora and submission of field note book

P.R.Government College (A)

I BSC B.Voc (Horticulture)/Semester End

Botany (Noncore) Practical Model Paper., Semester – 1

Time -2 hrs Max Marks =35

1. Major experiment -- 12 marks
2. Minor Experiment -- 10 marks
3. Spotters and Slides -- 8 Marks
4. Record -- 5 Marks

P.R.Government College (A)

Botany (Noncore) Syllubus., Semester – II

Total – 2 Hrs /week **credits-2**

Basic concepts of Cell Biology and Genetics

Unit-1

1. Cell theory; ultrastructure of plant cell.
2. Cell division – Mitosis and meiosis.
3. Structure of a eukaryotic chromosome; euchromatin and heterochromatin.
4. Types of chromosomes; karyotype and ideogram.

Unit-2

1. Structural changes in chromosomes.
2. Numerical changes in chromosomes.
3. Evolution of *Brassica* species.
4. Evolution of *Solanum* species.

Unit-3

1. Mendel's work laws of inheritance; Chromosomal theory.
2. Non-allelic gene interactions.
3. Quantitative inheritance – multiple factor hypothesis.
4. Comparison of qualitatively and quantitatively inherited characters.

Unit-4

1. Linkage - experiment of Bateson and Punnet; coupling and repulsion.
2. Crossing over ; cytological proof for crossing over - Stern's experiment; significance of crossing over;
3. Two point and three point test cross.

Unit-5

1. Identification of genetic material; nucleic acids.
2. Watson and Crick model of DNA; Semi-conservative replication of DNA.
3. RNA as genetic material - Frankel, Conrat and Singer experiment; types and functions of different RNAs.
4. Gene concept; Jumping genes

P.R.Government College (A)
I BSC B.Voc (Horticulture)/Semester End
Botany (Noncore) Semester – II
Basic concepts of Cell Biology and Genetics
Model Question paper

Max . time : 2 hrs **Max . marks : 50 marks**

Section A

Answer to all of the following **4x2=8M**

1. Nucleosome
2. Exon
3. DNA polymerase
4. Genome

Section –B

Answer any three of the following 3x4=12M

1. Cp DNA
2. Transposans
3. Features of genetic code
4. Euploidy
5. Cytoplasmic inheritance

Section –C

Answer any three of the following **3x10=30M**

1. Discribe the ultra structure of Nucleus

2. Explain the process of DNA replication

3. Explain about Mendel laws

4. Write about Chromosomal aberrations

5. Explain about Transcription

P.R.Government College (A)

I BSC B.Voc (Horticulture)/Semester End

Botany (Noncore) Practical Syllabus., Semester – II

Basic concepts of Cell Biology and Genetics

Suggested laboratory Experiments ;

1. Demonstration of ultra structure of nucleus by using photographs – nuclear pore complex , nuclear lamina
2. Demonstration of chromosome organization by using photographs - nucleosome structure , solenoid model 10nm , 30nm fibers
3. Demonstration of DNA replication by using photograph
4. Solving genetic problems related to monohybrid , dihybrid ratio and interaction of genes
5. Study of various stages of mitosis using cytological preparation of onion root tips
6. Study of various stages of meiosis using cytological preparation of onion flower buds

P.R.Government College (A)

I BSC B.Voc (Horticulture)/Semester End

Botany (Noncore) Practical Model Paper., Semester – II

Time -2 hrs Max Marks =35

1. Major experiment -- 12 marks
2. Minor Experiment -- 10 marks
3. Spotters and Slides -- 8 Marks
4. Record -- 5 Marks

P.R.Government College (A)

II BSC B.Voc (Horticulture)/Semester End
Botany (Noncore) Syllabus., Semester – III

Biotechnology and Tissue culture

Total – 2 Hrs /week **credits-2**

Module 1: Concepts of tissue culture

a. Plant tissue culture definition , history
b. Equipment and orgnisation of plant tissue culture labequipment,MS-medium
c. Basic concepts of Tissue culture- Explant,totipotancy,differentiation,dedifferentiation and redifferentiation,sterilization techniques.

Module 2: Methods in tissue culture

a.Organ culture-Meristem, and embryo cultures.
b.callus, cell,cell suspension techniques and their significance.
c.protoplast culture,somatic hybridization techniques.
Module3:a.Somatic embryogenesis and synthetic seeds
b. haploid plant production through tissue culture
c.Applications of plant tissue culture in the field of horticulture
Module3:

a.Somatic embryogenesis and synthetic seeds
b. haploid plant production through tissue culture
c.Applications of plant tissue culture in the field of horticulture

Module4- Tools and techniques of r-DNA technology

a.Restriction endonucleases classification,properties and applications.
b.Cloning vectors- Plasmids,Lambda phage,cosmids,BAC,YAC
cDifferent steps in gene cloning

Module-5 Production of Transgenic plants
a.direct methods of genetransfer-Biolistics,electroporation,microinjection advantages disadvantages of
b.vector mediated gene transfer-Agrobacterium Mediated genetransfer
c.Applications - insect resistance , nutritional quality (golden rice), shelf life (slow fruit softening tomoto)

P.R.Government College (A)
II BSC B.Voc (Horticulture)/Semester End
Botany (Noncore) Semester – II
Biotechnology and Tissue culture
Model Question paper

Max . time : 2 hrs **Max . marks : 50 marks**

Section A

Answer to all of the following **4x2=8M**

1 . Totipotency

2. Protoplast

3. C DNA

4. Golden rice

Section –B

Answer any three of the following 3x4=12M

1. Sterilization techniques
2. Somatic embryogenesis
3. Restriction endonucleases
4. YAC
5. Agrobacterium mediated gene Transfer

Section –C

Answer any three of the following **3x10=30M**

1. Process of tissue culture
2. Applications of Tissue culture in Horticulture field
3. Write about Protoplast hybridization
4. Explain about Vectors used in r-DNA technology
5. Explain about Methods of gene Transfer

P.R.Government College (A)

II BSC B.Voc (Horticulture)/Semester End

Botany (Noncore) Practical Syllabus., Semester – III

Biotechnology and Tissue culture

Suggested laboratory Exercises ;

1. Equipment for plant tissue culture

2. Sterilization techniques-plant material, glass ware , media

3. Preparation of MS medium

4 .Callus culture – micro propagation

5. Isolation of DNA

6. Demonstration of Gel electrophoresis

7. Demonstration of PCR

8. Study of bio technology products : antibiotics , vaccines, bio fertilizers , single cell protein , cosmetics,

9. Visit to research instistutes /Bio technology industries

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II BSC B.Voc (Horticulture)/Semester End

Botany (Noncore) Practical Model Paper., Semester – III

Time -2 hrs Max Marks =35

1. Major experiment -- 12 marks
2. Minor Experiment -- 10 marks
3. Spotters and Slides -- 8 Marks
4. Record -- 5 Marks

P.R.Government College (A)

II BSC B.Voc (Horticulture)/Semester End

Botany (Noncore) Syllabus., Semester – IV

Total – 2 Hrs /week credits-2

Biopesticides and Biofertilizers

UNIT-1 **Biopesticides**

a.Biopesticides-Introduction and types of biopesticides their advantages and limitations

b.Bacterial biopesticides-Bacillus thuringiensis,Pseudomonas fluorisens

c.Mechanism of biopesticides action on pest control

UNIT-2 **Fungal biopesticides**

a. Beauveria bassiana,Trichoderma viredeae

b. Viral biopesticides-Baculo virus,NPV

c. Advantages by using fungal and viral biopesticides

UN**IT-3 Bacterial Biofertilizers**

a. Introduction-The organisms that fixes atmospheric nitrogen-free living and symbiotic

b. Bacterial biofertilizers-
Rhizobium,Aazatobacter,Azospirillum,Acetobacter,Phosphobacteria and Frankia.

c.Advantages and limitations of bacterial biofertilizers

UNIT-4 Algal Biofertilizers

a**.** Blue Green Algae –cultivation and their advantages

b. Azolla-cultivation and their advantages

c. .Advantages and limitations of Algal fertilizers

UNIT-5 Fungal biofertilizers:

a. Mycorrhiza-Ectomycorrhiza and Vasicular Arbuscular Mycorrhiza(VAM)

b.Mycorrhiza and importance in horticulture

c.Fungal and Algal fertilizers role in various fields of horticulture.

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II BSC B.Voc (Horticulture)/Semester End
Botany (Noncore) Semester – IV
Biopesticides and Biofertilizers
Model Question paper

Max . time : 2 hrs **Max . marks : 50 marks**

Section A

Answer to all of the following **4x2=8M**

1.NPV

2.BT-cotton

3.biofertilizer

4.mycorrhiza

Section –B

Answer any three of the following 3x4=12M

1. Bacterial biopesticides
2. Write about advantages of viral biopesticides.

3. Write about advantages and limitations of algal biofertilizers.

4. Mycorrhiza applications in the field of horticulture.

5.Write about cultivation of Azolla.

Section –C

Answer any three of the following **3x10=30M**

echanism of biopesticides to control pests?
2.write about viral biopesticides?

3.write about bacterial biopesticides?

4.write about fungal biopesticides?

5.write about advantages of biopesticides and biofertilizers

P.R.Government College (A)

II BSC B.Voc (Horticulture)/Semester End

Botany (Noncore) Practical Syllabus., Semester – IV

Biopesticides and Biofertilizers

Suggested laboratory excercises :

1. Morphology of Nostoc and Anabaena using fresh material /permanent slides
2. Morphology of Azotobactor ,Azospirillum , Beijerinckia , Acetobactor , Phosphobacteria, Frankia using material / permanent slides/ photographs
3. Morphology of Mycorrhizae using permanent slides / photographs
4. Isolation and culture techniques of Cyanobacteria
5. Isolation and culture techniques of Bacteria
6. Cultivation of Azolla
7. Morphology of different organisms used as Bio pesticides with the help of permanent slides / photographs .
8. Mode of action of different bio pesticides .
9. Visit to research institute / industries working on bio fertilizers and bio pesticides .

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II BSC B.Voc (Horticulture)/Semester End

Botany (Noncore) Practical Model Paper., Semester – IV

1. Major experiment -- 12 marks
2. Minor Experiment -- 10 marks
3. Spotters and Slides -- 8 Marks
4. Record -- 5 Marks

P.R.Government College (A)
III BSC B.Voc (Horticulture)/Semester End
Botany (Noncore) Semester – V
Plant Breeding

Module-1

a.Plant breeding-Introduction**.**

b. Methods of plant breeding- Introduction,Selection,Hybridization

c.Methods of crop improvement

Module-2

a.Heterosis and Hybrid vigour

b.Mutations role in plant breeding

c.vegetative propagation methods used in plant breeding.

Module-3

a.Molecular markers in plant reading-RFLP,RAPD

b.Somaclonal variations.

c.current techniques used in plant breeding.

Module-4

a.Breeding for disease resistance-Back cross,Mutational resistance,Breeding for multiple resistance.

b.Exploitation of resistant genes advantages and limitations of resistance breeding

c.Advantages limitations in plant breeding for disease resistance.

UNIT-5

a.Qualities of an improved seed,definition

b.Improved seed-Production,multiplication,distribution

c.Seed testing-Testing agencies,types of seed tests,seed certification.

P.R.Government College (A)
III BSC B.Voc (Horticulture)/Semester End
Botany (Noncore) Semester – V
Plant Breeding
Model Question paper

Max . time : 2 hrs **Max . marks : 50 marks**

Section A

Answer to all of the following **4x2=8M**

1. Clonal Selection
2. Hybridization
3. Heterosis
4. Seed testing

Section –B

Answer any three of the following 3x4=12M

1. Mass selection
2. Hybrid vigour
3. RFLP
4. Somaclonal variations
5. Seed certification

Section –C

Answer any three of the following **3x10=30M**

1. Write about methods of crop improvement
2. Describe about mutational breeding
3. Discuss about current techniques in plant breeding
4. Write an essay on breeding techniques for diseases resistance
5. Write about seed testing methods

P.R.Government College (A)

III BSC B.Voc (Horticulture)/Semester End

Botany (Noncore) Practical Syllabus., Semester – V

Plant Breeding

1. Structure of monocot and dicot seeds
2. Seed germination test
3. Study of non dormant seed germination ,Breaking of seed dormancy caused by hard seed coat using scarificaton technique
4. Determination seed purity
5. Protocol for seed dressing using fungiside to controle diseases
6. Protocol for seed dressing using Biofertilizer (Rhizhobium) to enrich nutrient supply
7. Protocol for seed certification

P.R.Government College (A)

III BSC B.Voc (Horticulture)/Semester End

Botany (Noncore) Practical Model Paper., Semester – V

Time -2 hrs Max Marks =35

1. Major experiment -- 12 marks
2. Minor Experiment -- 10 marks
3. Spotters and Slides -- 8 Marks
4. Record -- 5 Marks

P.R.Government College (A)
III BSC B.Voc (Horticulture)/Semester End
Botany (Noncore) Semester – VI
Plant Physiology

Module -1 Plant water relations (10h)

a. Importance of water to life , physical properties of water , diffusion,imbibitions, osmosis

b. Concept and components of water potential

c. Absorption and lateral transport of water; Ascent of sap

Module-2 Plant metabolism-1 (12h)

b.Photosynthesis ; photosynthetic pigments, c. concept of two photo systems; mechanism of photosynthetic electron transport and evolution of oxygen photo phosphorylation

d.Carbon assimilation pathways(C_3,C_4 and CAM) ; Phosphorylation

Module-3 Plant metabolism (12h)

a. Respiration: Aerobic -Glycolysis, Krebs cycle..

b. Electron transport system, mechanism of oxidative phosphorylation ,

Module-4 Plant growth and development (8)

a. Stress physiology**,:** concepts and plant responses to water, salt and temperature stress

b. Growth and development: definition , phases and kinetics of growth.

c. Phytohormones : physiological effects of phytoharmones – auxins , gibberellins, cytokinins,

ABA , ethylene

Module -5

a. Nitrogen metabolism; Biological nitrogen fixatioin, nitrate reduction , ammonia assimilation and amino acid synthesis

b. Nif Genes, Nitrogenase ,Hydrogenase

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III BSC B.Voc (Horticulture)/Semester End
Botany (Noncore) Semester – VI
Plant Physiology
Model Question paper

Max . time : 2 hrs **Max . marks : 50 marks**

Section A

Answer to all of the following **4x2=8M**

1. Diffusion
2. Hill reaction
3. Substarte level phosphorylation
4. HSP

Section –B

Answer any three of the following 3x4=12M

1. Ascent of Sap
2. Photosynthetic pigments
3. Oxidative phosphorylation
4. Triple mechanism
5. Amino acid Synthesis

Section –C

Answer any three of the following **3x10=30M**

1. Write about mechanism of absorption of water
2. Describe about photo phosphorylation
3. Write about glycolysis
4. Write about growth inhibitors
5. Give a brief note on biological nitrogen fixation

P.R.Government College (A)
III BSC B.Voc (Horticulture)/Semester End
Botany (Noncore) Practical Syllabus., Semester – VI

Plant Physiology

1. Determination of osmotic potential by plasmolytic method using leaf epidermal cells of Rhoeo or Tradescantia
2. Determination of water potential in potato tuber cylinders by Gravimetric method
3. Determination of cell membrane permeability using beet root by colorimetric method
4. Determination of rate of transipiration using coblt chloride method / Ganong's photometer
5. Study of mineral deficiency symptoms using lat material / photographs
6. Determination of catalase activity using potato tubers by titration method
7. Determination of amylase activity using germination seeds of green gram
8. Separation of chloroplast pigments using paper chromatography technique
9. Anatomy of C3,C4 and CAM leaves
   Estimation of protein by biuret method / Lowry method
10. Minor experiments – Osmosis , Arc – auxonometer , ascent of sap through xylem , cytoplasmic streaming

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III BSC B.Voc (Horticulture)/Semester End

Botany (Noncore) Practical Model Paper., Semester – VI

Time -2 hrs Max Marks =35

1. Major experiment -- 12 marks
2. Minor Experiment -- 10 marks
3. Spotters and Slides -- 8 Marks
4. Record -- 5 Marks

CHEMISTRY

P.R.GOVERNMENT COLLEGE (A), KAKINADA

CHOICE BASED CREDIT SYSTEM

B. Voc.(FIRST YEAR) COMMERCIAL AQUACULTRE/ HORTICULTURE

SEMESTER-I

2018-19

UNIT –I

p-block elements –I **15h**

Group-13: Synthesis and structure of diborane and higher boranes (B_4H_{10} and B_5H_9**),**

boron-nitrogen compounds ($B_3N_3H_6$ and BN)

Group - 14: Preparation and applications of silanes and silicones.

Group - 15: Preparation and reactions of hydrazine, hydroxylamine.

UNIT-II

p-block elements -II **10h**

Group - 16: Classifications of oxides based on (i) Chemical behaviour and

(ii) Oxygen content.

Group-17: Inter halogen compounds and pseudo halogens.

UNIT-III

Structural theory in Organic Chemistry 10 h

Bonding in Carbon compounds- Hybridization of orbitals- Types of Hybridization(SP^3,SP^2 and SP) with examples. Types of bond fission and organic reagents (Electrophillic, Nucleophillic, and free radical reagents including neutral molecules like H_2O, NH3&$AlCl_3$).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 Resonance or Mesomeric effect, application to (a) acidity of phenol, and (b) acidity of carboxylic acids.Types of Organic reactions : Addition - electrophilic, nucleophilic and free radical. Substitution - electrophilic, nucleophilic and free radical. Elimination- Examples

UNIT-IV

l. **Acyclic Hydrocarbons** **8 h**

Alkenes - Preparation of alkenes. Properties: Addition of hydrogen. 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; Acidity of acetylenic hydrogen (formation of Metal acetylides). Preparation of higher acetylenes, Metal ammonia reductions, Physical properties. Chemical reactivity - electrophilic addition of X_2, HX, H_2O (Tautomerism), Polymerisation reaction of acetylene.

2. **Alicyclic hydrocarbons (Cycloalkanes) 5 h**

Nomenclature, Preparation by Freunds method, Wislicenus method. Properties - reactivity of cyclopropane and cyclobutane by comparing with alkanes, Stability of cycloalkanes - Baeyer's strain theory, Sachse and Mohr predictions and Pitzer's strain theory. Conformational structures of cyclobutane, cyclopentane, cyclohexane.

List of Reference Books

1. Inorganic Chemistry by J.E.Huheey
2. Basic Inorganic Chemistry by Cotton and Wilkinson
3.A textbook of qualitative inorganic analysis by A.I. Vogel
4. Organic Chemistry by Morrisson and Boyd
5. A Text Book of Organic chemistry by I L Finar Vol I
6. Concise Inorganic Chemistry by J.D.Lee

PITHAPUR RAJAH'S GOVERNMENT COLLEGE (AUTONOMOUS), KAKINADA

B.VOC. FIRST YEAR - COMMERCIAL AQUACULTURE / HORTICULTURE

SEMESTER -I

CHEMISTRY BLUE PRINT

2018-19

S. No.	Course Content	Essay Questions (10M)	Short Answer Questions (4M)	Very Short Answres Questions (2M)	Total No. of Marks allotted to each Unit
1	Unit - I	2	1	1	26
2	Unit - II	1	2	1	20
3	Unit - III	2	1	1	26
4	Unit - IV	1	2	1	20
	TOTAL	**6**	**6**	**4**	**92**

LABORATORY COURSE-I **30** hrs (2 h / w)

Practical-I Simple Salt Analysis
(At the end of Semester-I)

Qualitative inorganic analysis

Analysis of simple salt containing one anion and cation from the following

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

cations: Lead, copper, iron, aluminum, zinc, manganese, nickel, calcium, strontium, barium, potassium and ammonium.

P.R.GOVERNMENT COLLEGE (A), KAKINADA

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B. Voc.(FIRST YEAR) COMMERCIAL AQUACULTRE/ HORTICULTURE

SEMESTER-I

2018-19

MODEL QUESTION PAPER

Time: 2 hrs.30 min **TITLE: CHEMISTRY** **Max. Marks: 50**

PART-I

SECTION – A

Answer **THREE** questions by choosing at least one question from each section. Each question carries 10 Marks. 3X10=30M

1. Write the preparation and two chemical properties of hydrazine and hydroxyl amine.
2. Write any two preparation methods of B_2H_6.Explain the structure of Diborane with the help of bridge bond.
3. Explain the classification of Oxides based on chemical behavior and oxygen content.

SECTION – B

4. Define Inductive Effect. and write any two applications of Inductive Effect.
5. Explain the different types of Organic Reactions.
6. Explain the addition of HX to Alkenes with reference to Markonikov's and AntiMarkonikov's rule.

PART-II

Answer any **THREE** of the following questions. Each question carries **4** marks. 3X 4 = 20M

7. Explain one method of preparation and two applications of of Silanes
8. Explain Pseudo halogens.
9. Explain the structures and hybridization of of IF_7,
10. Explain sp^3 hybridization
11. Explain Diels-Alder reaction.
12. Write about the acidic nature of Acetylene. How 2-Butyne is prepared from Acetylene

PART-III

Answer **ALL** questions. **4X2=8M**

13. Draw the structure of B_4H_{10} and B_5H_9
14. Define Inter halogen compounds.
15. Write short note on Heterolytic fission
16. Write Any one polymerization reaction of acetylene

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P.R.GOVERNMENT COLLEGE (A), KAKINADA

CHOICE BASED CREDIT SYSTEM

B. Voc.(FIRST YEAR) COMMERCIAL AQUACULTRE/ HORTICULTURE

SEMESTER-II

2018-19

UNIT-I

l. Surface chemistry **8 h**

Definition of colloids. Solids in liquids(sols), preparation, purification, properties - kinetic, optical, electrical. Stability of colloids, Hardy-Schulze law, protective colloid. Liquids in liquids (emulsions) preparation, properties, uses. Liquids in solids (gels) preparation, uses.Adsorption: Physical adsorption, chemisorption. Freundlisch, Langmuir adsorptionisotherms. Applications of adsorption.

UNIT-II

Chemical Bonding **7h**

Valence bond theory, hybridization, Types of Hybridization (sp^3d, sp^3d^2, sp^3d^3) with examples. Molecular orbital theory - LCAO method, construction of M.O. diagrams for homonuclear and hetero-nuclear diatomic molecules (N_2, O_2, CO and NO).

UNIT-III

Stereochemistry of carbon compounds **15 h**

Molecular representations- Wedge, Fischer, Newman and Saw-Horse formulae.

Optical isomerism: Optical activity- wave nature of light, plane polarised light, optical rotation and specific rotation.

Chiral molecules- definition and criteria(Symmetry elements)- Definition of enantiomers and diastereomers – Explanation of optical isomerism with examples Glyceraldehyde, Lactic acid, Alanine, Tartaric acid.

D,L and R,S configuration methods and E,Z- configuration with examples.

UNIT-IV

Benzene and its reactivity **10h**

Concept of resonance ,structure 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 Crafts alkylation and acylation. Definition of ortho, para and meta directing groups. Ring activating and deactivating groups with example

List of Reference Books

1. Stereochemistry of Organic compounds by E L Eliel

2. Advanced Organic Chemistry by F A Carey and R J Sundberg

3. Stereochemistry by P.S.Kalsi

4. Stereochemistry of Organic compounds by D. Nasipuri

5. Advanced Inorganic Chemistry Vol-I by Satyaprakash, Tuli, Basu and Madan

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PITHAPUR RAJAH'S GOVERNMENT COLLEGE (AUTONOMOUS), KAKINADA

B.VOC. THIRD YEAR - COMMERCIAL AQUACULTURE / HORTICULTURE

SEMESTER -II

CHEMISTRY BLUE PRINT

2018-19

S. No.	Course Content	Essay Questions (10M)	Short Answer Questions (5M)	Very Short Answres Questions (2M)	Total No. of Marks allotted to each Unit
1	Unit - I	2	1	1	26
2	Unit - II	1	2	1	20
3	Unit - III	2	1	1	26
4	Unit - IV	1	2	1	20
	TOTAL	**6**	**6**	**4**	**92**

LABORATORY COURSE -II **30** hrs (2 h / w)

Practical-II Analysis of Mixture Salt (At the end of Semester-II)

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, aluminum, zinc, manganese, calcium, strontium, barium, potassium and ammonium.

P.R.GOVERNMENT COLLEGE (A), KAKINADA

CHOICE BASED CREDIT SYSTEM

B. Voc.(FIRST YEAR) COMMERCIAL AQUACULTRE/ HORTICULTURE

SEMESTER-II

2018-19

MODEL QUESTION PAPER

Time: 2 hrs.30 min **TITLE: CHEMISTRY** **Max. Marks: 50**

PART-I

SECTION – A

Answer **THREE** questions by choosing at least one question from each section. Each question carries 10 Marks. 3X10=30M

1. Explain the kinetic, optical and electrical properties of colloids.
2. Derive the expression for Langmuir adsorption isotherm
3. Write the salient features of Molecular Orbital Theory. Draw the Molecular Orbital Energy diagram of O_2 molecule and explain its bond order and magnetic behavior.

SECTION – B

4. Explain Cahn In gold and Prelog rules for assigning R, S configuration to optically active molecules with examples.
5. Define optical isomerism. Explain the optical isomerism in Lactic acid, alanine and tartaric acid.
6. Explain the mechanism of Nitration and Friedal-Crafts Alkylation of Benzene.

PART-II

Answer any **THREE** of the following questions. Each question carries **4** marks. 3X 4 = 12M

7. Write the differences between physical adsorption and chemical adsorption.
8. Explain the structure of Ni $(CO)_4$.
9. Explain sp^3d hybridization with example. Mention the bond angles
10. Define enantiomers and diastereomers. Give examples.
11. Explain the orbital structure of benzene.
12. What are ortho ,para and meta directing groups give examples.

PART-III

Answer **ALL** questions. **4X2=8M**

13. Define emulsions
14. Draw the structure of SF_6 and mention the hybridization in S
15. Define chairal compounds give examples
16. Define huckels rules.

PITHAPUR RAJAH'S GOVERNMENT COLLEGE (AUTONOMOUS), KAKINADA

B.VOC. SECOND YEAR - COMMERCIAL AQUACULTURE / HORTICULTURE

SEMESTER-III

CHEMISTRY SYLLABUS

2018-19

MODULE: 1 Carbohydrates: 12 hrs

Classification based on functional group and on hydrolysis, aldoses and ketoses, Properties and structural elucidation of Monosaccharides - glucose and fructose; oligosaccharides - sucrose, lactose, maltose (structures only); polysaccharides-starch, cellulose, glycogen (structures only).

Sources and types of carbohydrates in plants. Functions of

Carbohydrates in plants and animals. The functional role of sugar in food. Terminology in sugars (total sugar, free sugar, added sugar).

MODULE: 2 Proteins: 12hrs

Elementary idea of amino acids. Essential and non- essential amino acids. preparation methods of Amino Acids, Zwitter ion and isoelectric point. Peptide bond, polypeptides, proteins; primary, secondary and tertiary structure of proteins and quaternary structure (qualitative idea only), denaturation of proteins, enzymes.

Vitamins: Classification and biological functions of A, D, E, K and B- Complex.

Porphyrines- Structure and biological functions of Hemoglobin and Chlorophyll.

MODULE: 3 Lipids: 10hrs

Classification and structures of Lipids– Biological role- Rancidity, causes, types and prevention.

Hormones: Chemical Structure, Classification and functions of progesterone, testosterone and cholesterol in bio-system.

MODULE: 4 Analytical Chemistry 14hrs

Theories of Acids and Bases- Important features, definitions of acids and bases and limitations of Arrhenius theory, Bronsted- Lowry theory and Lewis theory. Buffer solutions- definition, types and examples. Titrimetric analysis- Types of titrations- Indicators. Theories of Acid-Base indicators (Ostwald theory and Quinonoid theory). Redox titrations. Theory of redox titrations. Redox indicators.

PITHAPUR RAJAH'S GOVERNMENT COLLEGE (AUTONOMOUS), KAKINADA

B.VOC. SECOND YEAR - COMMERCIAL AQUACULTURE / HORTICULTURE

SEMESTER-III

CHEMISTRY BLUE PRINT

2018-19

S. No.	Course Content	Essay Questions (10M)	Short Answer Questions (4M)	Very Short Answres Questions (2M)	Total No. of Marks allotted to each Unit
1	Unit - I	2	1	1	26
2	Unit - II	1	2	1	20
3	Unit - III	2	1	1	26
4	Unit - IV	1	2	1	20
	TOTAL	**6**	**6**	**4**	**92**

LABORATORY COURSE – III SEMESTER 30 hours.(2 hours / week)

Practical Paper-II SEMESTER-III

Titrimetric Analysis & Organic Functional Group Reactions

(At the end of Semester-III)

Titrimetric analysis:

1.Determination of Fe(II) using $KMnO_4$ with Oxalic acid as primary standard.

2.Determination of Cu(II) using $Na_2S_2O_3$ with $K_2Cr_2O_7$ as primary standard.

Organic Functional Group Reactions:

3.Reactions of the following functional groups present in organic compounds

(at least four)

Alcohols, Phenols, Aldehydes, Ketones, Carboxylic acids and Amides.

P.R.GOVERNMENT COLLEGE (A), KAKINADA

CHOICE BASED CREDIT SYSTEM

B. Voc.(Second Year) COMMERCIAL AQUACULTRE/ HORTICULTURE

SEMESTER-III

2018-19

MODEL QUESTION PAPER

Time: 2 hrs.30 min **TITLE: CHEMISTRY** **Max. Marks: 50**

PART – 1

Answer any **THREE** questions choosing at least one question from each section**.** Each question carries 10 Marks. 3 X 10 = 30M

SECTION- A

1. Elucidate the open chain structure of Glucose.
2. Explain the structures and biological functions of Hemoglobin and Chlorophyll.
3. What are Vitamins? Write the biological functions of vitamins A, D, E and K.

SECTION- B

4. Define “Rancidity”. Explain the causes and prevention of different types of rancidity.
5. Define “Acids” and “Bases” with examples by the following theories.

i. Bronsted- Lowry theory
ii. Lewis theory

6. Explain the following theories of acid- base indicators.

i. Ostwald theory
ii. Quinonoid theory

Part – II

Answer any **Three** Questions. Each question carries **4 Marks.** **3x4=12**

7. Explain the functional role of sugar in foods.
8. What are essential and non- essential amino acids? Give examples.
9. Write different sources of carbohydrates in plants.
10. What are lipids? Write their classification with examples.
11. What are buffer solutions? Write their classification with examples.
12. Explain different types of titrations with examples.

Part – III

Answer all the following Questions. Each question carries **2 Marks.** **4x2=8**

13. Define “Total sugar” and “free sugar”.
14. Define “Isoelectric point”.
15. Write any two functions of Cholesterol.
16. Write any two examples of redox indicators.

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PITHAPUR RAJAH'S GOVERNMENT COLLEGE (AUTONOMOUS), KAKINADA

B.VOC. SECOND YEAR - COMMERCIAL AQUACULTURE / HORTICULTURE

SEMESTER-IV

CHEMISTRY SYLLABUS

2018-19

Module: 1 Heterocyclic compounds

1.1. Nomenclature of Heterocyclic compounds

1.2. Classification of Heterocyclic compounds

1.3. Resonance structure of Furan, pyrrole, thiophene, pyridine

1.4. Preparation methods and Electrophillic reactions of Furan

1.5. Preparation methods and Electrophillic reactions pyrrole

1.6. Preparation methods and Electrophillic reactions of thiophene

1.7. Preparation methods and Electrophillic reactions pyridine. Chichibabin reaction with mechanism.

MODULE: 2 Coordination Chemistry-I

Terminology- Complexes, ligands, coordination number, oxidation state, coordination sphere, chelates. IUPAC nomenclature of coordination compounds with examples. Classification of ligands. Werner's theory, limitations. Sidgwick theory, EAN definition and calculation of EAN in complexes ($[Ni(CO)_4]$, $[Cr(NH_3)_6]Cl_3$, $K_4[Fe(CN)_6]$, $K_3[Fe(CN)_6]$). Isomerism in coordination compounds – structural Isomerism, types and examples.

Module: 3 Coordination chemistry-II

Crystal Field Theory- important features of Crystal Field Theory- Splitting of d- orbitals in Octahedral, tetrahedral and square planar complexes. Low spin and High spin complexes. Coordination compounds in Biology- structure, biological functions of Vitamin B-12. Effect of CO on hemoglobin.

Module: 3 Catalysis

Catalysis- definition and classification. Important features of catalyst in chemical reactions.

Enzymes- definition and classification. Biological functions of enzymes. Factors affecting enzyme catalysis. Enzyme catalyzed reactions- mechanism of enzyme catalyzed reactions- Michelis- Menton mechanism and rate law.

PITHAPUR RAJAH'S GOVERNMENT COLLEGE (AUTONOMOUS), KAKINADA

B.VOC. SECOND YEAR - COMMERCIAL AQUACULTURE / HORTICULTURE

IV SEMESTER

CHEMISTRY BLUE PRINT

2018-19

S. No.	Course Content	Essay Questions (10M)	Short Answer Questions (4M)	Very Short Answres Questions (2M)	Total No. of Marks allotted to each Unit
1	Unit - I	2	1	1	26
2	Unit - II	1	2	1	20
3	Unit - III	2	1	1	26
4	Unit - IV	1	2	1	20
	TOTAL	**6**	**6**	**4**	**92**

LABORATORY COURSE-IV

Practical Paper-IV

(At the end of semester IV)

30 hrs (2hrs/w)

Physical Chemistry **25 marks**

1.Critical Solution Temperature : Phenol-Water system

2.Effect of NaCl on critical solution temperature in 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.

IR Spectral Analysis **10 marks**

5.IR Spectral Analysis of the following functional groups with examples

a)Hydroxyl groups

b)Carbonyl groups

c)Amino groups

d)Aromatic groups

PITHAPUR RAJAH'S GOVERNMENT COLLEGE (AUTONOMOUS), KAKINADA

B.VOC. SECOND YEAR - COMMERCIAL AQUACULTURE / HORTICULTURE

SEMESTER-IV

CHEMISTRY 2018-19

MODEL QUESTION PAPER

Time: 2 hrs.30min. **Max. Marks: 50**

PART – I

Answer any **THREE** questions choosing at least one question from each section. Each question carries 10 Marks. 10 x 3 = 30M

SECTION- A

1. Write any one method of preparation of Furon and Pyrole. Write any two electrophillic reactions each of Furon & thiophene.
2. Explain different types of structural isomerism in coordination compounds with examples.
3. (i) Write important features of sidgwick theory.
   (ii) Define EAN. Calculate EAN in (a) $Ni(CO)_4$ (b)K_4 $[Fe(CN)_6]$

SECTION- B

4. Explain splitting of d-orbitals in octahedral and tetrahedral complexes on the basis of the crystal field theory.
5. Define enzymes.give examples .write the factors effecting enzyme catalysis
6. Define rate law for enzyme catalyzed reaction.write Michelis- Menton mechanism.

PART-II

Answer any **THREE** of the following questions. Each question carries **4** marks. 3X 4 = 20M

7. Draw the resonance structures of thiophene and pyridine.
8. Explain werner's theory of coordination compounds.
9. Write the classification of ligands with examples.
10. What are low spin and high spin complexes ? give examples.
11. Write the classification of enzymes.
12. Write any four charecterstic features of a catalyst.

Part – III

Answer all the following Questions. Each question carries **2** Marks.
4x2=8M

13. What is chichibabin reaction?
14. Write the iupac name of the following.
    a) $K_3[Fe(CN)_6]$ b) $[Co(NH_3)_4Cl_4]Cl$
15. Write the effect of carbondioxide on hemoglobin.
16. What is homogenous catalysis ? Give example.

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PITHAPUR RAJAH'S GOVERNMENT COLLEGE (AUTONOMOUS), KAKINADA

B.VOC. THIRD YEAR - COMMERCIAL AQUACULTURE / HORTICULTURE

SEMESTER -V

CHEMISTRY SYLLABUS

2018-19

MODULE - I

1. **Metal carbonyls and related compounds** **8h**

EAN rule, definition and classification of metal carbonyls, preparation, structures and shapes of metal carbonyls of Cr, Fe, Co and Ni and metallocenes (only Ferrocene).

MODULE-II

2. Drugs:

15h a. Introduction: Drug, disease (definition), Historical evolution, Sources – Plant,

Animal, synthetic, Biotechnology and human gene therapy

b. Terminology: Pharmacy, Pharmacology, Pharmacophore, Pharmacodynamics, Pharmacokinetics (ADME, Receptors – brief treatment) Metabolites and Anti Metabolites.

c. **Nomenclature:** Chemical name and Generic name and trade name.

d. Classification: Classification based on structures and therapeutic activity with one example each.

e. HIV-AIDS: Definition, Causes of HIV, Prevention of HIV**.**

f. Synthesis: Synthesis and therapeutic activity of the following drugs,

1) Omeprazole 2) Ciprofloxacin 3) Paracetamol

MODULE-III

Pesticides (Insecticides & Herbicides)

Pesticides- definition and classification.

4.1. Preparation methods, structure and present status of following pesticides

a. DDT,

b. BHC,

c. Endrin,

d. Endosulphon, e. Baygon,

f. 2,4 D,

g. Malathion,

h. Parathion,

MODULE-IV10h

4. Macromolecules (Polymers): 15h

Definition, Classification of polymers, Types of polymerization(Addition & Condensation), Co-ordination polymerization, Co-polymers, Molecular weight of polymers-Number average and Weight average molecular weight, Determination of molecular weight of polymer by osmotic pressure-Degree of polymerization, Preparation and industrial application of polyethylene, PVC, Teflon, terelene, Nylon-6 and Nylon-6, 6.

PITHAPUR RAJAH'S GOVERNMENT COLLEGE (AUTONOMOUS), KAKINADA

B.VOC. THIRD YEAR - COMMERCIAL AQUACULTURE / HORTICULTURE

SEMESTER -V

CHEMISTRY BLUE PRINT

2018-19

S. No.	Course Content	Essay Questions (10M)	Short Answer Questions (4M)	Very Short Answres Questions (2M)	Total No. of Marks allotted to each Unit
1	Unit - I	2	1	1	26
2	Unit - II	1	2	1	20
3	Unit - III	2	1	1	26
4	Unit - IV	1	2	1	20
	TOTAL	**6**	**6**	**4**	**92**

LABORATORY COURSE – V

Practical Paper – V (at the end of semester V)

30 hrs (3 h / W)

Organic Qualitative Analysis: 50M

Analysis of an organic compound through systematic qualitative procedure for functional group identification including the determination of melting point and boiling point with suitable derivatives. Alcohols, Phenols, Aldehydes, Ketones, Carboxylic acids, Aromatic Primary Amines, Amides and Simple sugars.

P.R.GOVERNMENT COLLEGE (A), KAKINADA

CHOICE BASED CREDIT SYSTEM

B. Voc.(THIRD YEAR) COMMERCIAL AQUACULTRE/ HORTICULTURE

SEMESTER-V

2018-19

MODEL QUESTION PAPER

Time: 2 hrs.30 min **TITLE: CHEMISTRY** **Max. Marks: 50**

PART-I

SECTION – A

Answer **THREE** questions by choosing at least one question from each section.

Each questioncarries 10 Marks. 3X10=30M

13. Write any one method of preparation of metal carbonyls. Explain the structures of the following a) $Fe(CO)_5$ b) $Cr(CO)_6$
14. Explain the classification of drugs based on structure and therapeutic activity.
15. Write the synthesis and therapeutic activity of the following drugs
    i) Omeprazole
    ii) Paracetamol

SECTION – B

16. Write synthesis and present status of the following pesticides
    i) DDT ii) 2,4-D
17. Explain the determination of molecular weight of polymers by Osmatic pressure method.
18. Write the preparation and applications of the following
    i) PVC ii) polyethylene iii) Teflon

PART-II

Answer any **THREE** of the following questions. Each question carries **4** marks. 3X 4 = 12M

19. What are metal carbonyls ? how they are classified?
20. Explain different sources of drugs.

21. What is HIV? What are different causes of HIV?
22. Write the synthesis and present status of BHC.
23. Define polymers . Write the classifications of polymers based on chemical reaction
24. Define number average molecular weight and weight average molecular weight of polymers. Write the mathematical equations to express them.

PART-III

Answer **ALL** questions. **4X2=8M**

17. Write the IUPAC name and structure of FERROCENE
18. Define Pharmacophore give example
19. Write any two measures prevention of HIV-AIDS.
20. What are herbicides? Give examples.

PITHAPUR RAJAH'S GOVERNMENT COLLEGE (AUTONOMOUS), KAKINADA

B.VOC. THIRD YEAR - COMMERCIAL AQUACULTURE / HORTICULTURE

SEMESTER -VI

CHEMISTRY SYLLABUS

2018-19

MODULE – I

1.Spectrophotometry: 8h

General features of absorption – spectroscopy, Beer-Lambert's law and its limitations, transmittance, absorbance, and molar absorptivity. Single and double beam spectrophotometers. Application of Beer-Lambert law for quantitative analysis of

1. Chromium in $K_2Cr_2O_7$ 2. Iron (III) with thiocyanate.

2. **Spectroscopy:**

3. **Electronic spectroscopy**: 8h

Interaction of electromagnetic radiation with molecules and types of molecular spectra. Energy levels of molecules (σ, π, n). Selection rules for electronic spectra. Types of electronic transitions in molecules effect of conjugation. Concept of chromospheres and auxochrome.

3. **Green Chemistry: 8h**

Introduction: Definition of green Chemistry, need of green chemistry, basic principles of Green chemistry. Selection of solvent:

i) Aqueous phase reactions ii) Reactions in ionic liquids iii) Solid supported synthesis iv) Solvent free reactions (solid phase reactions)

ii) Green catalysts: i) Phase transfer catalysts (PTC) ii) Biocatalysts

MODULE – II

Separation techniques: 21h

1) Chromatography: Definition, principles, Classification of chromatography methods, principles of differential migration adsorption phenomenon, Nature of adsorbents, solvent systems, Rf values, factors affecting Rf values.

a) Paper Chromatography: Principles, Rf values, experimental procedures, choice of paper and solvent systems, developments of chromatogram –ascending, descending and radial. Two dimensional chromatography, applications.

b) Thin layer Chromatography (TLC): Advantages. Principles, factors affecting Rf values. Experimental procedures. Adsorbents and solvents. Preparation of plates. Development of the chromatogram. Detection of the spots. Applications.

c) Column Chromatography: Principles, experimental procedures, Stationary and mobile Phases, Separation technique. Applications.

d) Gas Chromatography (GC): Principles, types, experimental procedures and applications.

e) HPLC: Principles and applications.

PITHAPUR RAJAH'S GOVERNMENT COLLEGE (AUTONOMOUS), KAKINADA

B.VOC. THIRD YEAR - COMMERCIAL AQUACULTURE / HORTICULTURE

SEMESTER- VI

CHEMISTRY BLUE PRINT

2018-19

S. No.	Course Content	Essay Questions (10M)	Short Answer Questions (4M)	Very Short Answres Questions (2M)	Total No. of Marks allotted to each Unit
1	Unit - I	2	1	1	26
2	Unit - II	1	2	1	20
3	Unit - III	2	1	1	26
4	Unit - IV	1	2	1	20
	TOTAL	**6**	**6**	**4**	**92**

LABORATORY COURSE – VI

Practical Paper – VI

(at the end of semester VI) 30 hrs (2 h/W)

1. Determination of rate constant for acid catalyzed ester hydrolysis.

2. Determination of molecular status and partition coefficient of benzoic acid in Benzene and water.

3. Determination of Surface tension of liquid

4. Determination of Viscosity of liquid.

5. Adsorption of acetic acid on animal charcoal, verification of Freundlisch isotherm

P.R.GOVERNMENT COLLEGE (A), KAKINADA

CHOICE BASED CREDIT SYSTEM

B. Voc.(THIRD YEAR) COMMERCIAL AQUACULTRE/ HORTICULTURE

SEMESTER-VI

2018-19

MODEL QUESTION PAPER

Time: 2 hrs.30 min **TITLE: CHEMISTRY** **Max. Marks: 50**

PART-I

SECTION – A

Answer **THREE** questions by choosing at least **one** question from each section.

Each question carries 10 Marks.
3X10=30M

1. State Beer Lamberts Law. Explain the qualitative determination of estimation of $K_2Cr_2O_7$ by .Beer Lamberts Law.
2. Explain different types of electronic transitions in electronic spectroscopy.
3. Write the twelve basic principles of green chemistry.

SECTION – B

4. Define chromatography. Explain the classification of chromatographic methods ,mention the mobile phase and the stationary phase in each chromatographic method.
5. Write principle and experimental details of TLC.
6. Explain the following types of paper chromatography

i) Ascending, ii) Descending iii) Radial. iv) Two dimensional

PART-II

Answer any **THREE** of the following questions. Each question carries **4** marks. 3X 4 = 12M

7. Explain the single beam and double beam spectrophotometers

8. Explain Chromophore and Auxochrome
9. Explain the following i) Aqueous phase reactions ii) Solvent free reactions
10. Explain different methods of detection of spots in TLC
11. Write any four applications of GLC
12. What are phase transfer catalysts? Give examples.

PART-III

Answer **ALL** questions. 4X2=8M

13. Write any two limitations of Beer's Law.
14. Write the selection rules for electronic spectroscopy
15. Define green chemistry.
16. Define R_f value.

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ENGLISH

P.R. GOVT. COLLEGE (AUTONOMOUS), KAKINADA

B.Voc Horticulture SYLLABUS FOR I YEAR

GENERAL ENGLISH PAPER
SEMESTER - I (W.E.F. 2018 — 2019)

Prescribed Text

Language Through literature - Orient Black Swan Publication

Instructional Objectives:

- To provide exposure to good literary pieces in various forms.
- To improve the learners' syntax / grammar / vocabulary.
- To improve the learners' communication skills.
- To make the learners' apply English skills in day to day life.
- To promote the learners' reading and writing skills.
- To improve the learners' comprehensive capability

UNIT / MODULE — I

PROSE

1. The Knowledge Society - A.P.J.AbdulKalam
2. The Language of African Literature- NgugiWaThiongó
3. The astrologer's day - R.K.Narayan

UNIT / MODULE — II

POETRY.

1. The Solitary Reaper - William Words Worth.
2. The Road Not taken- Robert Frost.
3. Night of the Scorpion - Nissim Ezekiel.

UNIT / MODULE — III

Non-detailed

1. The Lost child - Milk Raj Anand
2. The Last Leaf - O'Henry

UNIT / MODULE — IV

The Merchant of Venice - William Shakespeare (casket scene Act-ii/ Scene v-ix)

UNIT-V

Antonyms& Synonyms
One word substitutions
Jumbled sentences
Illustrating information from given table
Filling up the form
Articles
Correction of sentences(Nouns & Adjectives)
Degrees of Comparison
Tree Diagram

P.R. GOVT. COLLEGE (AUTONOMOUS), KAKINADA

B.Voc Horticulture GENERAL ENGLISH

I SEMESTER MODEL QUESTION PAPER

WITH EFFECT FROM THE ACADEMIC YEAR 2018-2019

(Should be reduced to 50 marks after valuation)

PART-A

Time: 2 ½ Hrs **Marks: 60**

I. Answer any TWO of the following questions. 2x5=10 M

1. How can one judge whether a nation is qualified to be a knowledge society?

2. What should be done in order to generate wealth in our country?

3. How does Ngugi describe a language in the lesson "The language of African Literature'?

II. Answer any TWO of the following questions. 2x5=10 M

1. According to Robert Frost, which road do people normally choose and why?

2. What were the peasants saying as they came at the end in the poem 'Night of the Scorpion'?

3. How does Words Worth convey the melody of the song of high land girl in his poem The Solitary Reaper?

III. Answer any One of the following Questions. 1x5 = 5 M

1. Describe the fair that the child went to in the story "The lost child".

2. Sketch the character of "Portia" from the play "The Merchant of Venice".

IV. Read the following paragraph and answer the questions given below. Choose an appropriate option(i.e A or B or C or D) from those given under each question and rewrite the entire sentence along with the answer. 5x1=5marks

I woke up one August morning in a warm sweat. I ran to the refrigerator to get a cold drink, but the refrigerator was broken and all the drinks were as hot as me. I walked over to my electric fan, but it wasn't working either. I then turned on the television and finally realized that the electricity in my house was out. Later that day, I went to the pool to cool off. I dived right in! I swam eight laps before

I tired out. My friend Jeremy then bought me an ice cream cone. I got a vanilla ice cream cone with rainbow sprinkles. Even though it was really hot, I did have a lot of fun.

ANSWER THE QUESTIONS:

1. What did the narrator want from the refrigerator?

a. a ham sandwich b. a fan c. a drink d. an apple

2. Why didn't the electric fan work?

a. it was broken b. it needed batteries c. the power was out d. it wasn't oiled

3. How many laps did it take for the narrator to tire of the pool?

a. two b. four c. six d. eight

4. Who bought the narrator an ice cream cone? a. Sarah b. Samantha c. Joe d. Jeremy

5. What was the flavor of the ice cream?

a. vanilla b. rainbow c. Chocolate d. strawberry

PART-B

Answer any SIX of the following 6x5=30marks

V. Choose the word that is nearest to the meaning of the word that is underlined.

5x1=5m

1. The officer is not pleased with his work.
   (a) Disappointed (b) dismembered (c) disengaged
2. She rejected my offer.
   (a) Accepted (b) disagree (c) refused
3. He is optimistic that he will get this job.
   (a) Hopeless (b) hopeful (c) pessimistic
4. She won my heart with her mercy towards children.
   (a) Cruel (b) aggressive (c) kind
5. Her gorgeous eyes got her a cinema chance.
   (a) Ugly (b) beautiful (c) large

VI. Fill in the blanks that is opposite in meaning to the underlined word.

5X1=5M

1. North Indians rivers are deep. But south Indian rivers are _____
   (a) Curvy (b) clean (c) shallow
2. Raju is intelligent. But his brother is _____
   (a) Stupid (b) greedy (c) irresponsible
3. Air is light. But water is _____
   (a) Dark (b) heavy (c) clean

4. Though he is short his hands are _____

(a) Thick (b) weak (c) long

5.Clean water keeps us healthy. But _____ water leads to ill health

(a)Prudent (b) dirty (c) unclear

VII. Fill in the blanks with suitable articles where ever necessary. 5x1=5m

1.----------Nile is a long river.

2. He has been suffering for _____ last two days.

3. _____ Nawab of Hyderabad joined the Alliance.

4._____ poor are becoming poorer.

5. We must attend upon _____ sick.

VIII. Answer the questions given under the table based on the table provided.

5marks.

SNO	Name of the student	D.O.B	Class Studying	Weight in Kgs	Height in Feet
1	JesuDanam	21-07-2011	Ist class	24	3
2	Eswar	13-06-1996	B.Ed	65	5”feet 9 inches
3	Hareesh	19-04- 1996	M.A	58	5 feet 9 inches
4.	Vijaya Lakshmi	01-05-1995	House wife	45	4 feet 8 inches
5.	Ramya	09-08-2002	Intermediate	40	4 feet 2 inches

1. Who is the tallest of the students?
2. How many students were born in the same year?
3. Who is the heaviest among the boys?
4. Who is studying post graduation?
5. Vijaya Lakshmi is heavier than Ramya by how many Kgs?

IX. Convert the following sentences as directed 5x1=5marks

1. Kumar is one of the most intelligent boys in the class.(change into positive)

2. The longest river in Africa is not longer than the longest river in India. (change into positive)
3. Rani is as beautiful as Vani. (change into comparative)
4. Mariana is the deepest trench on the Earth. (change into comparative)
5. It is easier to peach than to practice. (change into positive)

X. Arrange the following sentences in a logical order. 5x1=5m

a)love / of others / good manners / and / win the / respect

(b) when / best / they can / one is / be learnt / young

(c)saves us / turns away / soft answer / anger and / a / a pitfall / from many

(d)who is /stranger / respectful / a person / even /like

(e) sure/ in life/ they / passport/ are a / for success

X.Match the following words with their definitions or meanings. 5x1=5m

A	B	
1.	Ophthalmologist	Study of birds
2.	Lexicographer	A person who never touches alcohol
3.	Florist	Eye Specialist
4.	Ornithology	Person who prepares Dictionary
5.	Teetattler	A person who sells flowers

XI. Fill up the following form with suitable information 5x1=5m

BHUMI Membership Application Form

Personal details (* = compulsory)

Full Name : _____

Date of birth : ___ ___ ____

Age : _____

Blood Group : _____ Sex : _____

Mobile phone no. : _____ Landline : _____

E-mail Id (primary): _____

Website : _____

Residential Address: _____

City/Town : _____ State : _____

Country : _____ PIN/ZIP code: _____

Which of the following locality in Kakinada is near your place :
Of residence, (you will by default belong to that team, which can be changed later upon request).

Educational Qualification : _____College/Institution : _____

Occupation * : _____

Company/Organization* : _____

NGO Experience : _____

Write **'None'** if any field is not applicable

P.R. GOVT. COLLEGE (AUTONOMOUS), KAKINADA

B.Voc Horticulture

COMMUNICATION and SOFT SKILLS

SECOND SEMESTER

Unit - I : Vocabulary building

Prefixes And Suffixes

Compound words

One word substitutes

Words often confused

Phrasal Verbs

Unit II & III - Grammar

Types of Verbs

Subject Verb agreement

Tense forms

Articles and Prepositions

Unit - IV - Listening Skills

Types of listening

Barriers of Effective listening

Strategies for effective listening

Unit V - Reading Skills

Skimming

Scanning

Intensive/ Extensive Reading

P.R. GOVT. COLLEGE (AUTONOMOUS), KAKINADA

B.Voc Horticulture

COMMUNICATION and SOFT SKILLS

SECOND SEMESTER Model Paper

Total marks 50 Time 2 hrs

Answer the following 6x5=30marks

I. Look at the underline part in each word and write its meaning. 10x1/2=5m

e.g. bicycle=two

1.semicircle

2.multipurpose

3.tripod

4.anticlimax

5. misunderstand

6. postpaid

7. supermarket

8.reload

9. Prorich

10. Hyperactive.

II. Write noun forms for following by choosing appropriates suffixes 10x1/2=5m

E.g Supervise = supervision

1. commit

2. oblige

3.Expect

4.Normal

5.Examine

6.Relate

7.Capable

8.False

9.Conceive

10.apply

III. Select the right option. 5x1=5m

1. The rice seems to be very (coarse/course)
2. Rasagulla is a delicious (dessert/ desert)
3. Everyone prefers (piece/peace) to war.
4. Mr.Sharma is (formally/formerly) the Principal of this college.
5. Petrol is very precious. We must use it (judiciously/judicially)

IV. Choose the appropriate phrasal verb for the underlined in each sentence by selecting from the list. 5x1=5m

Put out , put off , took off , called off, closed down, passed away

1. The old man <u>died</u> due to cancer.
2. There was a fire accident in our locality yesterday. The fire fighters came and <u>stopped</u> the fire.
3. The RTC workers strike was <u>cancelled</u>.
4. The plane could not <u>leave the ground</u> due to bad weather.
5. The University <u>deferred</u> the exams on the request of students.

V. Correct the following sentences 5x1=5m

1. This scissors is very blunt.
2. A Team of doctors have examined the patient.
3. He said that he will be ready.
4. I saw your brother while I am returning from college.
5. I am going to college every day.

VI. Fill in the blanks with suitable prepositions 5x1=5m

1. India is a leading country _____ software development.
2. Milk is good _____ health.
3. The cat jumped _____ the rat.
4. She held her pen _____ her fingers.
5. The house is _____ the Balaji Temple.

UNIT- II

Answer any Two questions 2x5=10marks

1. What are the barriers to effective listening?
2. List out various strategies we can adopt for effective listening?
3. Write a note on the types of listening?

Unit - III

(READING SKILLS)

Write a note on any Two of the following 2x5=10marks

1. skimming

2. Intensive reading

3. scanning

P.R. GOVT. COLLEGE (AUTONOMOUS), KAKINADA

COMMUNICATION and SOFT SKILLS (CSS -3)

B.Voc Horticulture

III SEMESTERSYLLABUS

Common for all UG courses

CSS - 2 aims at improving the speaking skills of the learner. For many learners of English, the

sound-spelling relationship of the language appears anarchic. Another problem of many Indian learners face is English word accent. Unit I and Unit II help learners overcome these problems to a great extent. The remaining units are on the two productive skills, speaking and writing. The techniques of day-to-day conversations and the important characteristics of interviews and GDs presented in this course strengthen the learner's speaking skills. The last unit presents various aspects of presentation in writing.

Unit I: Pronunciation - 1
The Sounds of English
Unit II: Pronunciation – 2
1. Word Accent
2. Intonation
Unit III: Speaking Skills -1
1. Conversation Skills
2. Interview Skills
3. Presentation Skills
4. Public Speaking
Unit IV: Speaking Skills -2
1. Role Play
2. Debate
3. Group Discussion
Unit V: Writing Skills
1. Spelling
2. Punctuation
3. Information Transfer- Tables
Bar Diagrams
Line Graphs
Pie Diagrams
Flow Charts
Tree Diagrams
Pictures

P.R. GOVT. COLLEGE (AUTONOMOUS) KAKINADA

B.Voc Horticulture

COMMUNICATION and SOFT SKILLS (CSS -3)

III Semester Model Paper

Time: 2hrs **marks: 50m**

SECTION-I

I. Answer any three of the following questions : 3x5=15marks

1. Consonants and Consonant clusters

2. pure vowels and Diphthongs

3. Explain phonemic symbols and phonemic transcription? What is their use?

4. What is Intonation? What are the various intentions that can be conveyed through intonation?

5. What are the differences between English and Telugu in terms of spellings and pronunciation?

SECTION-II

II. Answer any three of the following questions : 3x5=15marks

6. What is a syllable and how are words on the basis of number of syllables classified.

7. What are content words? What are structure words? Give suitable examples.

8. What is neutral accent? How can we achieve it?

9. In what way a dictionary is useful to the learner for improving one's pronunciation or stress?

10. What type of pronunciation problems do the Telugu speakers face when they speak English?

SECTION-III

III. Answer any four of the following questions : 4x5=20marks

11. Write a brief note on the dos and dont's of power point presentation?

12. Prepare a role-play (dialogue) between a hotel receptionist and a customer who wants to book a room.

13. Imagine yourself ask an interviewer for jobs and write a list of questions you would like to ask the candidate.

14. What is a Group Discussion ? What is its Purpose?

15. What are the various skills and personality traits that can be assessed in a Group Discussion?

16. Describe the various punctuation marks use in Written English.

17. Describe the process of Making Tea (five cups) by using a flow-chart.

P.R. GOVT. COLLEGE (AUTONOMOUS) KAKINADA

B.Voc Horticulture

COMMUNICATION AND SOFT SKILLS (CSE +III)

IV Semester

1. Soft Skills

Positive Attitude

Body Language

SWOT/SWOC Analysis

Emotional Intelligence

Netiquette

2. Paragraph Writing

Paragraph Structure *Development of Ideas*

3, Paraphrasing and Summarizing

Elements *of Effective Paraphrasing*

Techniques fur Paraphrasing

Summaries

4.

Letter Writing

Formal and Informal *Letters E-correspondence*

5.

job Application and CV

Resume and CV

Covering *Letter*

Question Paper Pattern

Model Question Paper

P.R. GOVT. COLLEGE (AUTONOMOUS) KAKINADA

B.Voc Horticulture

COMMUNICATION AND SOFT SKILLS (CSE +III)

IV Semester

Section — A

(Soft Skills)

Time : 2hrs **Marks 50**

Answer any Three of the following Questions: 3 x 5 =15 marks

1. What is positive thinking and what are its uses?
2. What is Body Language? How can we improve it?
3. Write a note on SWOT/SWOC analysis - Give suitable examples,
4. What is EQ or Emotional Intelligence? Why do we need it?

Section — B

(Paragraph Writing)

Answer any Three of the following: 3 x 5 = 15

5. Explain the different types of Paragraph
6. How can we develop ideas or a topic and write them into a Paragraph?
7. Write a Paragraph on any one of the following?
   i) Train Hard and Fight Easy
   ii) Anger is one letter short of danger.
8. What are the characteristics of a perfect paragraph.

Section — C

Answer any Three of the following 3x5=15marks

9. Explain the terms 'Paraphrasing " and Summarizing
10. What are the skills / techniques required for summarising?
11. Surnmarising the following passage by reducing it to 1/3rd of its length: English is a useful language. The people who speak English today make up the largest speech community in the world. A speech community is similar to other kinds of communities. The people who make up a speech community share a common language.. Many nations are composed of a single major speech community, for example. Italy, Sweden, and Japan. National Boundaries. however, are not always the same as the boundaries of a speech community. Some nations for example., Russia and India, are made up or many speech communities.. Some speech communities extend across national boundaries (for example, Arabic, Spanish, and English).
12. What are the ways in which a paragraph or an essay can be enlarged (Padded)?

Section — I

(Letter writing and Resume writing)

Answer any Two of the following : 1 x 5 = 05 m

13. Write a letter to your father explaining to him your future plan (after completion of studies)

14. Write a letter of complaint to the Station House Officer of Police Station of your locality about the theft of your mobile phone.
15. You are applying for the post Management Trainee (General) in NTPC, Jyothinagar, Ramagundam. Prepare your Resume with all the necessary details

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ENVIRONMENTAL SCIENCE

P. R. Government College (Autonomous), Kakinada

Syllabus for Environmental Studies (Credit) to I Bvoc Horticulture

II Semester . 2018 -2019

SECTION – 1 : BIOLOGICAL SCIENCES

MODULE -1 1. **Basic concepts of Environmental Studies :** Definition, need for Public awareness; Physical environment, Biotic environment; Factors effecting environment; Man-environment relationships; balances in environment (El Nino).

2. **Water resources:** Forms of available water, Hydrological cycle, water requirement and uses of surface and ground water; over utilization of surface and ground water; cause, effect and control of floods; floods in India.

MODULE -2 1. **Ecosystems** : Concept of ecosystem, structure and functions of an ecosystem; energy flow in the ecosystem; pond ecosystem; food chains, food webs and ecological pyramids. Wildlife Protection Act.
Food resources: role of Agriculture, the Green revolution, Unsustainable impact, sustainable agriculture, organic farming,

food and health.

2. **Human Population and Environment** : Population explosion, family welfare programmes; Role of Information Technology - environment and human health.

SECTION – 2 : PHYSICAL SCIENCES

MODULE – 3

1. **Energy Resources:** Classification of energy resources- petroleum, natural gas, biogas energy; wastes as renewable sources of energy- types and classification of wastes; solar energy- Solar PhotoVoltaic Cells (SPVC); wind energy; hydroelectric energy; nuclear energy (Atomic energy).

2. **Air pollution** - causes of air pollution, Major air pollutants ; effects of air pollutants, control measures ; air pollution episodes of the World. **Water pollution –** causes of water pollution major water pollutants; aspects of water pollution- Biochemical Oxygen Demand (BOD), fresh water blooms; effects of water pollution, control of water pollution. pollution of oceans, sewage and fertilizers.

MODULE – 4

1.**Soil Pollution** : Causes of soil pollution, soil degradation; effects of soil pollution, control of soil pollution; role of an individual in the prevention of pollution.

2. **Social issues and the environment climate change**: Global warming, acid rains, Ozone layer depletion, nuclear accidents.

P. R. Govt. College (Autonomous), Kakinada, E. G. Dt.

I Bvoc Horticulture.,Environmental Studies at the end of II Semester

Model blue print for the Question Paper setter

Unit / Chapter name	Section-A : Essay Questions & Marks	Section -B : Short Answer Questions & Marks	Total Questions & Marks allotted to Module (s)
Module-1 : Basic concepts of Environmental Studies & Water Resources	1 (10)	2 (10)	3 (18)
Module-2 : Ecosystems, Food resources, and Human Population and Environment	1 (10)	2 (10)	3 (18)

Module-3 : Energy Resources & Air and Water Pollution	1 (10)	2 (10)	3 (18)
Module-4 : Soil Pollution &	1 (10)	2 (10)	3 (18)
One from **Module- 1 or 2**	1 (10)	-	1 (10)
One from **Module- 3 or 4**	1 (10)	-	1 (10)
Total Questions & Total Marks Allotted =	**6 (60)**	**8 (40)**	**14 (100)**

Note : 1. Question paper setters are requested to adhere strictly to the above blue print While preparing the said paper.

2. Marks for Questions / Modules are shown in parenthses.

P.R.Government College (Autonomous), Kakinada
Environmental Studies (Credit) to I Bvoc Horticulture
II Semester . 2018 -2019

Environmental Studies - Model Paper

Time: 2 Hrs. **Max. Marks: 50 M**

SECTION – A **3 x 10 = 30 M**

Answer any Three of the following

1. Write an essay on different types of water resources and their conservation.
2. Discuss the role of Agriculture in solving the food problems of our country.
3. Write an essay on various types of energy resources.
4. Write about environmental changes responsible for acid rains and ozone layer

depletion.

5. Define ecosystem. Write in detail about the pond ecosystem.

6. What is air pollution? Describe various factors responsible for air pollution.

SECTION – B **4 x 5 = 20 M**

Answer any Four of the following

7. Man – environment relationships
8. Hydrological cycle
9. Green revolution
10. Family welfare programmes
11. Nuclear energy
12. Biochemical Oxygen Demand
13. Soil degradation

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ICT

DEPARTMENT OF COMPUTER SCIENCE
INFORMATION & COMMUNICATION TECHNOLOGY –1 (ICT-1)
SEMESTER-II (W.E.F 2016-17)
Computer Fundamentals and Office Tools
Common for all Degree Programmes
II Semester
(30 Hours of Teaching Learning including Lab)

Unit-I:

Basics of Computers :Definition of a Computer - Characteristics and Applications of Computers – Block Diagram of a Digital Computer – Classification of Computers based on size and working – Central Processing Unit – I/O Devices.

Unit-II:

Primary, Auxiliary and Cache Memory – Memory Devices. Software, Hardware, Firmware and People ware – Definition and Types of Operating System – Functions of an Operating System – MS-DOS – MS Windows – Desktop, Computer, Documents, Pictures, Music, Videos, Recycle Bin, Task Bar – Control Pane.

Unit-III:

MS-Word

Features of MS-Word – MS-Word Window Components – Creating, Editing, Formatting and Printing of Documents – Headers and Footers – Insert/Draw Tables, Table Auto format – Page Borders and Shading – Inserting Symbols, Shapes, Word Art, Page Numbers, Equations – Spelling and Grammar – Thesaurus – Mail Merge

Paper: I
Marks: 50

Unit-IV:

MS-PowerPoint

Features of PowerPoint – Creating a Blank Presentation - Creating a Presentation using a Template - Inserting and Deleting Slides in a Presentation – Adding Clip Art/Pictures – Inserting Other Objects, Audio, Video - Resizing and Scaling of an Object – Slide Transition – Custom Animation

Unit-V:

MS-Excel Overview of Excel features – Creating a new worksheet, Selecting cells, Entering and editing Text, Numbers, Formulae, Referencing cells – Inserting Rows/Columns –Changing column widths and row heights, auto format, changing font sizes, colors, shading.

Reference Books:

1. Fundamentals of Computers by ReemaThareja, Publishers : Oxford University Press, India
2. Fundamentals of Computers by V.Raja Raman, Publishers: PHI
3. Microsoft Office 2010 Bible by John Walkenbach, Herb Tyson, Michael R.Groh and FaitheWempen, Publishers : Wile.

P.R. GOVT COLLEGE (AUTONOMOUS), KAKINADA
MODEL PAPER (W.E.F. 2016-17)
I B.A/B.Sc/B.Com (Common for All Degree)
SEMESTER –II

Sub: ICT- I
Time: 2 hrs

SECTION – A

Answer any FOUR questions the following **3 x 10= 30 M**

1. Write about characteristics of Computer?
2. Explain types of computers?
3. Explain Primary and Secondary memory devices?
4. Explain Desktop and Recycle bin?
5. Explain feature of MS-Word?
6. Explain header and Footer in MS-Word?

7. Explain features of MS-Power point?
8. How to inserting Rows and Columns in MS-Excel?

SECTION – B

Answer any THREE questions the following x 5= 20 M **4** **Time: 2hrs Marks: 50**

9. Draw and explain block diagram of Computer in details?
10. Explain various input and output devices?
11. Explain types of operating system?
12. What is Mail-Merge? Explain Mail-Merge concept in MS-Word?
13. Explain Types of Views in MS-Power point?
14. Explain features of MS-Excel?

P. R.GOVT. COLLEGE (AUTONOMOUS), KAKINADA
MODEL BLUE PRINT (W.E.F. 2016-17)
I B.A/B.Sc/B.Com (Common for All Students)
SEMESTER -II
INFORMATION AND COMMUNICATION TECHNOLOGY-I
SUBJECT: ICT
PAPER- I

Model blue print for the model paper and choice

S.No	Type of Question	To be given in the Question Paper			To be Answered		
		No. of	Marks	Total	No. of	Marks	Total

		Questions	allotted to each Question	Marks	Questions	allotted to each Question	Marks
1	**Section - B Short Questions**	**8**	**3**	**24**	**5**	**3**	**15**
2	**Section – A Essay Questions**	**4**	**10**	**40**	**2**	**10**	**20**
Total Marks				**64**	**Total Marks**		**35**

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P.R. GOVERNMENT COLLEGE (AUTONOMOUS), KAKINADA
1st YEAR FOUNDATION COURSE
HUMAN VALUES AND PROFESSIONAL ETHICS
1st SEMESTER - CREDITS - 2 FC-1
SYLLABUS
Effected from Admitted Batch of 2018-2019

Unit - I Introduction to Value Education - 6Hrs.

1. Value Education, Definition, Concept and Need for Value Education
2. The content and process of value education
3. Self-Exploration as a means of Value Education
4. Happiness and prosperity as parts of value education

HVPE

Unit - II Harmony in the Human Being - 6Hrs.

1. Human Being is more than just the Body
2. Harmony of the Self (I) with the Body
3. Understanding myself as co-existence of the self and the body
4. Understanding needs of the self and the needs of the body

Unit - III Harmony in the family and society and Harmony in the nature. - 6Hrs.

1. Family as a basic unit of Human Interaction and values in relationships
2. The basics for respect and today's crisis: Affection, Care, Guidance, Reverence, Glory, Gratitude and Love
3. Comprehensive Human Goal: The Five dimensions of human Endeavour

Unit - IV Social ethics - 6Hrs.

1. The basics for ethical human conduct
2. Defects in ethical human conduct
3. Holistic alternative and universal order
4. Universal human order and ethical conduct

Unit - V Professional Ethics - 6Hrs.

1. Value based life and profession
2. Professional ethics and right understanding
3. Competence in professional ethics
4. Issues in principles ethics – the current scenario
5. Vision for holistic technologies, production system and management models

REFERENCES:

1. A.N. Tripaty, Human Values, New Age International Publishers, 2003
2. Bajpai. B.L. Indian Ethos and Modern Management, New Royal Book Co., Lucknow, Reprinted, 2004
3. Bertrand Russell, Human Society in Ethics and Politics
4. Corliss Lamont, Philosophy of Humanism
5. Gaur. R.R., Sangal. R. Bagaria G.P., A Foundation Course in Value Education, Excel Books, 2009
6. Gaur R.R., Sangal, R. Bangaria. G.P., Teacher's Manual, Excel Books, 2009
7. I.C. Sharma, Ethical Philosophy of India, Nagin & Co., Julundhar
8. Mortimer.J.Adler, What Man has made of man
9. R. Subramanian, Professional Ethics and Human Values, Board of Intermediate
10. Text Book for Intermediate Ethics and Human Values, Board of Intermediate Education & Telugu Academy, Hyderabad.
11. William Lilly, Introduction to Ethics, Allied Publishers

P.R. GOVERNMENT COLLEGE (AUTONOMOUS) KAKINADA

1st YEAR FOUNDATION COURSE
HUMAN VALUES AND PROFESSIONAL ETHICS
1st SEMESTER - CREDITS - 2 FC-1
MODEL PAPER
Effective from Admitted Batch of 2018 – 2019

Time: 2 Hrs. Max. Marks: 50

Section - A

Answer Any Five of the Following 5x10 = 50

1. What is value Education? Explain the need for value education.
2. Self-Exploration as a means of value education – Discuss
3. Human being is more than just the body – Discuss
4. Explain the concept of understanding myself as co-existence of the self and the body.
5. Discuss the role the family in maintaining values in relationship
6. Write a brief note on the five dimensions of human Endeavour
7. Write a note on the basics for moral human conduct
8. Discuss the holistic alternative and universal order
9. Write a brief note on the values in profession
10. Discuss the need of competence in professional ethics

SOIL MICROBIOLOGY & AGRICULTURAL MICROBIOLOGY

P.R.Government College (Autonomous), Kakinada

I Bvoc Horticulture., Soil microbiology at the end of VI Semester

SOIL MICROBIOLOGY

UNIT I -

Introduction to Soil microbiology - Properties of soil (Structure, texture, formation). Types and significance of soil microbes – Bacteria, Fungi, Actinomycetes, Algae, Protozoa, Nematode and Viruses – Factors affecting microbial population.

Unit II –

Biogeochemical cycle – Carbon, Phosphorus, Nitrogen – Biological Nitrogen fixation – Nitrogen fixers Root nodule formation – Nitrogenase, Hydrogenase.

UNIT III –

Microbial interaction between microbes – Neutralism, Commensalism, Synergism, Mutualism, Amensalism,Symbiosis, Competition, Parasitism and Predation. Interaction of Microbes with plants – Rhizosphere and Mycorrhizae –Interaction of microbes – insects and rumen.

UNIT IV –

Plant pathology (symptoms, disease cycle and control measures) – Bacterial diseases – Blight of rice, Citrus canker Fungal disease – Red rot of sugarcane, Wilt of cotton, Tikka leaf spot of groundnut. Biofertilizer – Rhizobium and Azotobacter, Cyanobacteria, Azolla – Mass multiplication and crop response. Biopesticide – Bacterial, fungal and viral.

References:

1. Subba Rao NS (2004). Soil Microbiology. 4th Edition, Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi. Price Rs.295/-.

2. Mishra RR (2004). Soil Microbiology. 1st Edition, CBS Publishers and Distributors, New Delhi. Price Rs.175/-.

3. Rangaswami G and Mahadevan A (2002). Diseases of crop plants in India. 4th Edition, Printice-Hall of India Pvt. Ltd., New Delhi. 4. Robert, L Tate, (1995). Soil Microbiology. 1st Edition, John Wiley & Sons, Inc. New York.

P.R.Government College (Autonomous), Kakinada

III Bvoc Horticulture., Soil microbiology at the end of VI Semester

Model question paper

Time : 2 hours Max. Marks:50

PART – A **5 x 2 = 10**

Answer ALL of the following questions.

1. Pediology
2. Nitrogenase
3. Commensalism
4. Red rot of Sugar cane
5. Heterocyst

PART – B **5x 4= 20 M**

Answer any five of the following

6. Soil Profile
7. *Actinomycetes*
8. *Phosporus cycle*
9. *Root Nodule Formation*
10. *Mycorrhizae*
11. *Mutualism with example*
12. *Bacterial diseases*
13. *Fungal Pesticide*

PART – C **2x 10 = 20 M**

Answer any two of the following questions, Draw diagrams wherever necessary.

14. Briefly describe the properties of Soil
15. Explain about Carbon Cycle
16. Describe about microbial interactions
17. Discuss about Fungal diseases

P.R.Government College (Autonomous), Kakinada

B. Voc (Horticulture)

III B.voc Horticulture., Agricultural microbiology at the end of VI Semester

Module – 1 Microbes & Soil fertility **10 hours**

a. Microbes in Rhizosphere and Phyllosphere.

b. Plant growth - promoting microorganisms- Mycorrhizae, Rhizobia, *Azospirillum, Azotobacter,* Cyanobacteria, *Frankia*.

c. Outlines of biological nitrogen fixation (Symbiotic, Non-symbiotic).

Module -2 Microbes & Plant diseases **15 hours**

a. A general account of different plant pathogens : Virus, Bacteria,.

b. Symptoms, causal organism, disease cycle - environmental relations, management and control of following plant diseases:

i. Viral : Bunchy top of Banana; Tungro of Rice

ii. Bacterial : Citrus canker; Bacterial blight of Rice

c. Biological control of plant diseases. Biopesticides – Nuclear polyhedrosis virus (NPV), *Bacillus thuringiensis, Pseudomonas fluorescens* and *Trichoderma virede*.

Module – 3 Microbes in Environment **10 hours**

a. Microorganisms of environment (soil, water and air).

b. Role of microorganisms in nutrient cycling (Carbon, Nitrogen, Phophorus Sulphur).

c. Microbial interactions – mutualism, commensalism, antagonism, competition, parasitism, predation.

Module – 4 Microbes in Pollution Control **10 hours**

a. Microbes in potable and polluted waters. *E. coli* and *Streptococcus faecalis* as indicators of water pollution.

b. Sanitation of potable water. Sewage treatment (primary, secondary and tertiary). Outlines of biodegradation of environmental pollutants – pesticides.

c. Solid waste disposal – sanitary land fills, composting.

d. Microbiology of air and air sampling methods.

P.R.Government College (Autonomous), Kakinada

III Bvoc Horticulture., Agricultural microbiology at the end of VI Semester

Model question paper

Time : 2 hours Max. Marks:50

PART – A **5 x 2 = 10**

Answer ALL of the following questions.

18. PSM
19. NPV
20. Mutualism
21. Solid waste
22. Sanitary land fills

PART – B **5x 4= 20 M**

Answer any five of the following

23. Rhizosphere
24. *Azatobacter*
25. *Bacillus thuringiensis*
26. PPLO
27. Microbes in water
28. Sulphur cycle
29. Primary sewage treatment
30. Biodegradation of Pesticides

PART – C **2x 10 = 20 M**

Answer any two of the following questions, Draw diagrams wherever necessary.

31. Discuss about symbiotic Nitrogen fixation.

32. Write an essay on Blast of Rice.

16. Write an essay on the role of microorganisms in carbon cycle.

17. Write an account of sewage treatment.

P.R.Government College (Autonomous), Kakinada

III B. Voc (Horticulture)-Practical Syallubus

Agricultural microbiology

1. Isolation and enumeration of Rhizosphere microflora

2. Isolation and enumeration of Phyllosphere microflora
3. Isolation of Rhizobium from legume root nodules.
4. Isolation of *Azospirillum* and *Azatobacter*.
5. Staining and observation of VAM fungi.
6. Microbial examination of water by coli form test (Multiple tube Fermentation method)