

**CURRICULUM**

**FOR THE TRADE OF**

**HORTICULTURE ASSISTANT**

**UNDER**

**APPRENTICESHIP TRAINING SCHEME**

2017



**GOVERNMENT OF INDIA**  
**MINISTRY OF SKILL DEVELOPMENT & ENTREPRENEURSHIP**  
**DIRECTORATE GENERAL OF TRAINING**

## CONTENTS

Sl. No.	Topics	Page No.
1	Acknowledgement	3
2	Background 1.1 Apprenticeship Training under Apprentice Act 1961 1.2 Changes in Industrial Scenario 1.3 Reformation	4
3	Rationale	5
4	Job roles: reference NCO	6
5	General Information	7
6	Course structure	8
7	Syllabus 7.1 Basic Training 7.1.1 Detail syllabus of Core Skill A. Block-I (Engg. drawing & W/ Cal. & Sc.) B. Block-II (Engg. drawing & W/ Cal. & Sc.) 7.1.2 Detail syllabus of Professional Skill & Professional Knowledge A. Block – I B. Block – II 7.1.3 Employability Skill 7.1.3.1 Syllabus of Employability skill A. Block – I B. Block – II 7.2 Practical Training (On-Job Training) 7.2.1 Broad Skill Component to be covered during on-job training. A. Block – I B. Block – II	9-24
8	Assessment Standard 8.1 Assessment Guidelines 8.2 Final assessment-All India trade Test (Summative assessment)	25-27
9	Further Learning Pathways	28
10	Annexure-I – Tools & Equipment for Basic Training	29-31
11	Annexure-II – Tools & Equipment for On-Job Training	32
12	Annexure-III - Guidelines for Instructors & Paper setter	33

## 1. ACKNOWLEDGEMENT

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Special acknowledgement is expended by DGT to the following expert members who had contributed immensely in this curriculum.

### Co-ordinator for the course:

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## 2. BACKGROUND

### 1.1 Apprenticeship Training Scheme under Apprentice Act 1961

The Apprentices Act, 1961 was enacted with the objective of regulating the programme of training of apprentices in the industry by utilizing the facilities available therein for imparting on-the-job training. The Act makes it obligatory for employers in specified industries to engage apprentices in designated trades to impart Apprenticeship Training on the job in industry to school leavers and person having National Trade Certificate(ITI pass-outs) issued by National Council for Vocational Training (NCVT) to develop skilled manpower for the industry. There are four categories of apprentices namely; **trade apprentice, graduate, technician and technician (vocational) apprentices.**

Qualifications and period of apprenticeship training of **trade apprentices** vary from trade to trade. The apprenticeship training for trade apprentices consists of basic training followed by practical training. At the end of the training, the apprentices are required to appear in a trade test conducted by NCVT and those successful in the trade tests are awarded the National Apprenticeship Certificate.

The period of apprenticeship training for graduate (engineers), technician (diploma holders and technician (vocational) apprentices is one year. Certificates are awarded on completion of training by the Department of Education, Ministry of Human Resource Development.

### 1.2 Changes in Industrial Scenario

Recently we have seen huge changes in the Indian industry. The Indian Industry registered an impressive growth during the last decade and half. The number of industries in India have increased manifold in the last fifteen years especially in services and manufacturing sectors. It has been realized that India would become a prosperous and a modern state by raising skill levels, including by engaging a larger proportion of apprentices, will be critical to success; as will stronger collaboration between industry and the trainees to ensure the supply of skilled workforce and drive development through employment. Various initiatives to build up an adequate infrastructure for rapid industrialization and improve the industrial scenario in India have been taken.

### 1.3 Reformation

The Apprentices Act, 1961 has been amended and brought into effect from 22<sup>nd</sup> December, 2014 to make it more responsive to industry and youth. Key amendments are as given below:

- Prescription of number of apprentices to be engaged at establishment level instead of trade-wise.
- Establishment can also engage apprentices in optional trades which are not designated, with the discretion of entry level qualification and syllabus.
- Scope has been extended also to non-engineering occupations.
- Establishments have been permitted to outsource basic training in an institute of their choice.
- The burden of compliance on industry has been reduced significantly.

### **3. RATIONALE**

#### **(Need for Apprenticeship in Horticulture Assistant)**

The revised Apprenticeship Training Scheme (ATS) shall make the students more adapt to industry requirement through latest theoretical & practical inputs as:

1. It offers a good synergy between BT (Theoretical Inputs) & PT (On the Job training) unlike earlier scheme where students need to complete two year's classroom training before undergoing PT (On the Job training).
2. It will enhance knowledge about scientific principles, familiarization with horticulture, and basics of fruit nursery production and cultivation of fruit crops.
3. It will enhance the ability to work with help of hand tools, machinery in Horticulture.. At the same time it creates the base for achieving hand skills.
4. It will enhance knowledge about different types of fruit plants, soil requirement, implements and equipment's used and techniques used in Horticulture
5. It will enhance the ability to work on conventional as well as latest techniques and modernization in Horticulture.
6. It will enhance knowledge about Horticulture terminology, Horticulture practices and revitalize previous learning.

## **4. JOB ROLES: REFERENCE NCO**

### **Brief description of Job roles:**

On successful completion of the course the candidates can either get employed, or become a self-employed Entrepreneur in any one of the following fields.

#### **a) Wage Employment**

1. Horticulture supervisor
2. Nursery Assistant
3. Laboratory Assistant
4. Horticulture beldar

#### **b) Self Employment**

1. Orchard guide and contractor
3. Orchard care taker
4. Orchard nursery producer
5. Agro Service centre

Reference NCO: 7231.10

## 5. GENERAL INFORMATION

1. **Name of the Trade** : **HORTICULTURE ASSISTANT**

2. **N.C.O. Code No.** : 7231.10

3. **Duration of Apprenticeship Training** (Basic Training + Practical Training): 2years

### 3.1 For Fresher:-

**Duration of Basic Training:** -

a) Block –I : 3 months

b) Block – II : 3 months

**Total duration of Basic Training: 6 months**

**Duration of Practical Training (On -job Training): -**

a) Block–I: 9 months

b) Block–II : 9 months

**Total duration of Practical Training: 18 months**

### 3.2 For ITI Passed:-

**Duration of Basic Training:** - NIL

**Duration of Practical Training (On -job Training): 12 months**

6. **Entry Qualification** : 10th Passed

7. **Selection of Apprentices:** The apprentices will be selected as per Apprentices Act amended time to time.

**8. Rebate to ITI Passed out Trainees: one year** for the trade of Horticulture Assistant.

*Note: Industry may impart training as per above time schedule for different block, however this is not fixed. The industry may adjust the duration of training considering the fact that all the components under the syllabus must be covered. However the flexibility should be given keeping in view that no safety aspects is compromised.*

## 6. COURSE STRUCTURE

Training duration details: -

<b>Time (in months)</b>	<b>1-3</b>	<b>4-12</b>	<b>13-15</b>	<b>16-24</b>
<b>Basic Training</b>	<b>Block– I</b>	<b>-----</b>	<b>Block – II</b>	<b>-----</b>
<b>Practical Training (On - job training)</b>	<b>----</b>	<b>Block – I</b>	<b>-----</b>	<b>Block – II</b>

### Duration of Training in Months

Components of Training	Duration of Training in Months																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
<b>Basic Training Block - I</b>																								
<b>Practical Training Block - I</b>																								
<b>Basic Training Block - II</b>																								
<b>Practical Training Block - II</b>																								



**7. SYLLABUS**  
**7.1 BASIC TRAINING**  
**(BLOCK – I &II)**  
**DURATION: 06 MONTHS**

**GENERAL INFORMATION**

- |                                    |   |
|------------------------------------|---|
| <b>1) Name of the Trade</b>        | <b>:HORTICULTURE ASSISTANT</b>  |
| <b>2) Hours of Instruction</b>     | <b>: 1000 Hrs. (500 hrs. in each block)</b>                               |
| <b>3) Batch size</b>               | <b>: 16 Nos.</b>  |
| <b>4) Power Norms</b>              | <b>: 4.8 KW for Workshop</b>  |
| <b>5) Space Norms</b>              | <b>: 210Sq.m. (including Parking area)</b>                                |
| <b>6) Examination</b>              | <b>: The internal assessment will beheld on completion of each Block.</b> |
| <b>7) Instructor Qualification</b> | <b>:</b>  |

B.Sc in Agriculture (with elective Horticulture)/ B.Sc Horticulture from recognized university with one year experience in Horticulture.

**OR**

NTC/NAC in the trade of Horticulture Assistant with three year post qualification experience in the relevant field.

Preference will be given to a candidate with Craft Instructor Certificate (CIC)

- 8) Tools, Equipment & Machinery required : - As per Annexure – I**

## 7.1.1 DETAILSYLLABUS OF CORE SKILL

### A. Block– I Basic Training

Topic No.	a) Engineering Drawing	Duration (in hours)	b) Workshop Science & Calculation	Duration (in hours)
1	Free hand isometric sketching of simple objects with dimensions.	<b>30</b>	Geometry properties of lines, angles, triangles & circles. Land measurement local units as Marla, Kanal, bigha etc.	<b>20</b>
2	Drawing of layout and nursery models		Effect of forces on material in such application as extending, bending & shearing.	
3	Free hand sketching of plain and elevation of simple objects like hexagonal bar, square bar, circular bar, tapered bar, hollow bar etc. Free hand sketching of pump, emitter, sprinkler etc.		Electricity and its use. Electric current, positive terminals. Use of switches and fuses-conductors and insulators.	
4	Free hand sketching of mulches, sprayers, horticultural tools etc.		Technical advantage, velocity ratio and applied problems.	
5	Free hand sketching of mulches, sprayers, horticultural tools etc.		Simple calculations on fertilizer requirements.	
6-7	Views of cutting, budding, grafting etc.		Useful work of machine-mechanical efficiency of machine problems.	
8	Views of cutting, budding, grafting etc.		Calculations on efficiency of electric motors. Using electric motors and I.C. Engines on the farm.	
10-13	Free hand sketching of different storage structures, inter cropping, etc. Free hand sketching the power wiring circuit of a 3-phase AC motor		Definition of work, energy, horse-power, efficiency, mechanical advantage, torque, speed, pressure and volume and their application of units. Torque , powers and their calculations.Calculations on field capacity. Simple calculations on grain moisture measurement relative humidity, wet and dry bulb temperatures.	

## B. Block- II

### Basic Training

Topic No.	a) Engineering Drawing	Duration (in hours)	b) Workshop Science & Calculation	Duration (in hours)
1-2	Free hand isometric sketching of simple objects with dimensions. Free hand sketching of different fruit plants weed control in vegetables, horticulture etc.	30	Geometry properties of lines, angles, triangles & circles.	20
3-4	Free hand isometric sketching of simple objects with dimensions. Free hand sketching of different fruit plants weed control in vegetables, horticulture etc.		Factor of safety examples. Different types of stresses examples.	
5	Free hand sketching of plain and elevation of simple objects like hexagonal bar, square bar, circular bar, tapered bar, hollow bar etc. Free hand sketching of different vegetables.		Effect of forces on material in such application as extending, bending & shearing.	
6-8	Free hand sketching different harvesting implements used in different vegetables.		Technical advantage, velocity ratio and applied problems.	
9	Free hand sketching of cut flowers, shrubs, tree climbers etc.		Useful work of machine-mechanical efficiency of machine problems.	
10	Reading of simple blue print of graders, packaging machines.		Machines-basic principles, determination of velocity ratio, mechanical advantage and efficiency.	
11	Free hand sketching of different insects and pests.		Machines basic principle, determination of velocity ratio mechanical advantage and efficiency.	
12	Free hand sketching of field layout of different vegetable farms.		Logarithm-use of logarithmic tables for multiplication & division.	
13	Exercises on blue print reading. Layout of protected structures and micro irrigation systems. Free hand sketching the power wiring circuit of a 3-phase AC motor.		Simple calculation on water requirements, discharge and shape size of open channel. Calculations on suction head and discharge of tube well.	

## 7.1.2DETAIL SYLLABUS OF PROFESSIONAL SKILLS & PROFESSIONAL KNOWLEDGE

### A. Block –I

#### Basic Training

Week no.	PROFESSIONAL SKILL (275 Hours)	PROFESSIONAL KNOWLEDGE (120 Hour)
1	Definition, Importance and scope of Horticulture. Classification of fruit crops. Climate zones of Horticulture crops. Selection of site and soil. Soil and water testing for orchards.	Identification of fruits crops.
2	Planning and layout of orchards - different types of layout systems, planting distance in different fruit plants, high density plantation. Digging and filling of pits. Media for nursery production. Raising of virus free fruit plants. Role of growth regulators	Layout of orchards. Identification of horticulture tools. Digging and filling of pits. Soil and water sampling techniques for Horticulture crops
3	Different types of irrigation systems (Drip, flood, sprinkler, check basin etc.). Nutrition management: chemical composition of different organic and inorganic fertilizers and their application. Fertigation, foliar application of nutrients and role of bio fertilizers in different Horticulture crops. Leaf sampling in different fruit crops. Nutritional deficiencies in horticultural crops	Layout of different irrigation systems in the field. Identification of different fertilizers, application of fertilizers. Leaf sampling techniques and collection of leaf samples for different fruit crops. Identification of nutritional deficiencies symptoms in Horticultural crops
4	Weeds- Introduction, harmful and beneficial effects, characteristics and classification and their application. Type of mulches and their role in Horticulture. Green manuring, inter cropping in horticultural crops. Different types of sprayers and horticultural tools	Identification of weeds and their management. Use of mulches for weed control and moisture conservation
5	Soil sterilization and fumigation; seed treatment: stratification, scarification, preparation of seed and nursery beds, raising of nursery for different horticulture crops, transplanting of seedlings, preparation of potting mixtures for propagation of plants. Potting and re potting. Frost protection measures in Horticultural crops	Practical hands in layout and preparation of seed and nursery beds, sowing of seeds. Stratification of root stocks seeds. Methods of soil sterilization, filling of polybags, preparation of soil mixture
6-7	Sexual and asexual propagation their advantages and disadvantages. Different methods of propagation for	Demonstration of different methods of propagation in Horticulture crops

	Horticulture crops - cutting, layering, grafting, budding, tissue culture etc.	
8	Training and pruning and their importance, Canopy management of Horticultural crops. Rejuvenation techniques for old and senile orchards. Post-harvest management for horticultural crops (Harvesting techniques, maturity indices, storage and ripening techniques; grading and packaging).	Practices of different types of training and pruning methods in the field
9	Major insect-pests and diseases in fruit crops and their control measures	Identification of insect-pests and diseases in Horticultural crops
10-12	Cultivation of different major and minor fruit crops of India (Introduction, origin and distribution, soil and climate requirement, improved cultivars, propagation, planting methods, irrigation and fertilizers, weed management, intercropping, harvesting and handling, storage, insect-pest/disease/disorders).	Identification of different fruit species
13	Assessment /Exam-03 days	

**B. Block –II**  
**Basic Training**

Week No.	PROFESSIONAL SKILL (275 Hours)	PROFESSIONAL KNOWLEDGE (120 Hour)
1-2	Scope of vegetable cultivation in India. Importance of vegetables in human nutrition and their role in diversification. Role of soil, climatic and agronomic factors in vegetable and floriculture production. Principles of cultivation including direct sowing, nursery management, transplanting, hardening of seedlings and vegetable forcing. Weeds and their control. Rotation and Inter cropping in vegetable crops.	Identification of important vegetable seeds and plants. Raising of vegetable nurseries. Transplanting of vegetable seedlings in main field. Layout of kitchen garden and its maintenance. Ornamental nursery Preparation nursery beds, weed control, transplanting, raising of nursery in trays, plugs etc
3-4	Introduction to floriculture and landscaping. Planning of gardens. Formal and informal gardens. Use of trees, shrubs, climbers, palms, houseplants and seasonal flowers in the gardens. Making and maintenance of lawns. Training and pruning of rose, pinching disbudding in chrysanthemum etc. Landscaping-art principles.	Identification of trees, shrubs, house plants, seasonal flowers
5	Hybrid seed production of chilli, brinjal, tomato and muskmelon. seed plot technique, seed production in flowers	Selfing and crossing techniques, evaluation of hybrids progenies and seed production
6-8	Cultivation of potato, brinjal, chilli, tomato, root crops, cucurbitaceous, leafy vegetables: climate, soil, varieties, sowing, seed rate, method of sowing, diseases and pests, , harvesting and post-harvest handling	-do-
9	Cultivation of shrubs, tree, climbers, cut flowers, annual, pot flowers, rose, gladiolus etc,	Practice on cultivation of shrubs, tree, climbers, cut flowers, annual, pot flowers, rose, gladiolus etc,
10	Harvesting, grading, packaging and post harvest management in vegetables and flowers	Harvesting indices of different vegetable and flowers. Grading and packing of vegetables.
11	Major insect-pests and diseases in vegetables and flowers and their control measures	Identification of major pest-insects and diseases in vegetables and flowers
12	Importance of organic production of	Layout for inter cropping, preparation of FYM,

	vegetable crops; Methods for enhancing soil fertility, mulching, raising green manure crops. Indigenous methods of compost, Panchgavya, Biodynamics preparation etc. -Certification or organic products; organic production and export opportunity and challenges.	vermicompost, biodynamics preparation etc.
13	Assessment /Exam -03 days	

## **7.1.3 EMPLOYABILITY SKILLS**

### **GENERAL INFORMATION**

- 1) **Name of the subject** : **EMPLOYABILITY SKILLS**
- 2) **Applicability** : **ATS- Mandatory for fresher only**
- 3) **Hours of Instruction** : **110 Hrs. (55 hrs. in each block)**
- 4) **Examination** : **The examination will be held at the end of two years Training by NCVT.**
- 5) **Instructor Qualification** :

**i) MBA/BBA with two years experience or graduate in sociology/social welfare/Economics with two years experience and trained in Employability skill from DGET Institute.**

**And**

**Must have studied in English/Communication Skill and Basic Computer at 12<sup>th</sup> /diploma level**

**OR**

**ii) Existing Social Study Instructor duly trained in Employability Skill from DGET Institute.**



### 7.1.3.1 SYLLABUS OF EMPLOYABILITY SKILLS

#### A. Block – I Basic Training

Topic No.	Topic	Duration (in hours)
<b>English Literacy</b>		
<b>1</b>	<b>Pronunciation :</b> Accentuation (mode of pronunciation) on simple words, Diction (use of word and speech)	<b>15</b>
<b>2</b>	<b>Functional Grammar</b> Transformation of sentences, Voice change, Change of tense, Spellings.	
<b>3</b>	<b>Reading</b> Reading and understanding simple sentences about self, work and environment	
<b>4</b>	<b>Writing</b> Construction of simple sentences Writing simple English	
<b>5</b>	<b>Speaking / Spoken English</b> Speaking with preparation on self, on family, on friends/ classmates, on know, picture reading gain confidence through role-playing and discussions on current happening job description, asking about someone's job habitual actions. Cardinal (fundamental) numbers ordinal numbers. Taking messages, passing messages on and filling in message forms Greeting and introductions office hospitality, Resumes or curriculum vita essential parts, letters of application reference to previous communication.	
<b>I.T. Literacy</b>		
<b>1</b>	<b>Basics of Computer</b> Introduction, Computer and its applications, Hardware and peripherals, Switching on-Starting and shutting down of computer.	<b>15</b>
<b>2</b>	<b>Computer Operating System</b> Basics of Operating System, WINDOWS, The user interface of Windows OS, Create, Copy, Move and delete Files and Folders, Use of External memory like pen drive, CD, DVD etc, Use of Common applications.	
<b>3</b>	<b>Word processing and Worksheet</b> Basic operating of Word Processing, Creating, opening and closing Documents, use of shortcuts, Creating and Editing of Text, Formatting the Text, Insertion & creation of Tables. Printing document. Basics of Excel worksheet, understanding basic commands, creating simple worksheets, understanding sample worksheets, use of simple formulas and functions, Printing of simple excel sheets	
<b>4</b>	<b>Computer Networking and INTERNET</b> Basic of computer Networks (using real life examples), Definitions of Local Area Network (LAN), Wide Area Network (WAN), Internet, Concept of Internet (Network of Networks), Meaning of World Wide Web (WWW), Web Browser, Web Site, Web page and Search Engines. Accessing the Internet using Web Browser, Downloading and Printing Web Pages, Opening an email account and use of email. Social media sites and its implication. Information Security and antivirus tools, Do's and Don'ts in Information Security, Awareness of IT - ACT, types of cyber crimes.	

<b>Communication Skill</b>		
<b>1</b>	<b>Introduction to Communication Skills</b> Communication and its importance Principles of Effective communication Types of communication - verbal, non verbal, written, email, talking on phone. Non verbal communication -characteristics, components-Para-language Body - language Barriers to communication and dealing with barriers. Handling nervousness/ discomfort. Case study/Exercise	<b>25</b>
<b>2</b>	<b>Listening Skills</b> Listening-hearing and listening, effective listening, barriers to effective listening guidelines for effective listening. Triple- A Listening - Attitude, Attention & Adjustment. Active Listening Skills.	
<b>3</b>	<b>Motivational Training</b> Characteristics Essential to Achieving Success The Power of Positive Attitude Self awareness Importance of Commitment Ethics and Values Ways to Motivate Oneself Personal Goal setting and Employability Planning. Case study/Exercise	
<b>4</b>	<b>Facing Interviews</b> Manners, Etiquettes, Dress code for an interview Do's & Don'ts for an interview	
<b>5</b>	<b>Behavioral Skills</b> Organizational Behavior Problem Solving Confidence Building Attitude Decision making Case study/Exercise	

**B. Block-II**  
**Basic Training**

<b>Topic No.</b>	<b>Topic</b>	<b>Duration (in hours)</b>
<b>Entrepreneurship skill</b>		<b>10</b>
1	<b>Concept of Entrepreneurship</b> <b>Entrepreneurship-</b> Entrepreneurship - Enterprises:-Conceptual issue Entrepreneurship vs. Management, Entrepreneurial motivation. Performance & Record, Role & Function of entrepreneurs in relation to the enterprise & relation to the economy, Source of business ideas, Entrepreneurial opportunities, The process of setting up a business.	
2	<b>Project Preparation &amp; Marketing analysis</b> Qualities of a good Entrepreneur, SWOT and Risk Analysis. Concept & application of Product Life Cycle (PLC), Sales & distribution Management. Different Between Small Scale & Large Scale Business, Market Survey, Method of marketing, Publicity and advertisement, Marketing Mix.	
3	<b>Institutions Support</b> Preparation of Project. Role of Various Schemes and Institutes for self-employment i.e. DIC, SIDA, SISI, NSIC, SIDO, Idea for financing/ non financing support agencies to familiarizes with the Policies /Programmes& procedure & the available scheme.	
4	<b>Investment Procurement</b> Project formation, Feasibility, Legal formalities i.e., Shop Act, Estimation & Costing, Investment procedure - Loan procurement - Banking Processes.	
<b>Productivity</b>		<b>10</b>
1	<b>Productivity</b> Definition, Necessity, Meaning of GDP.	
2	<b>Affecting Factors</b> Skills, Working Aids, Automation, Environment, Motivation How improves or slows down.	
3	<b>Comparison with developed countries</b> Comparative productivity in developed countries (viz. Germany, Japan and Australia) in selected industries e.g. Manufacturing, Steel, Mining, Construction etc. Living standards of those countries, wages.	
4	<b>Personal Finance Management</b> Banking processes, Handling ATM, KYC registration, safe cash handling, Personal risk and Insurance.	
<b>Occupational Safety, Health &amp; Environment Education</b>		<b>10</b>
1	<b>Safety &amp; Health</b> Introduction to Occupational Safety and Health importance of safety and health at workplace.	
2	<b>Occupational Hazards</b> Basic Hazards, Chemical Hazards, Vibro-acoustic Hazards, Mechanical Hazards, Electrical Hazards, Thermal Hazards. Occupational health, Occupational hygienic, Occupational Diseases/ Disorders & its prevention.	
3	<b>Accident &amp; safety</b> Basic principles for protective equipment. Accident Prevention techniques - control of accidents and safety measures.	

4	<b>First Aid</b> Care of injured & Sick at the workplaces, First-Aid & Transportation of sick person	
5	<b>Basic Provisions</b> Idea of basic provision legislation of India. of safety, health, welfare under legislation of India.	
6	<b>Ecosystem</b> Introduction to Environment. Relationship between Society and Environment, Ecosystem and Factors causing imbalance.	
7	<b>Pollution</b> Pollution and pollutants including liquid, gaseous, solid and hazardous waste.	
8	<b>Energy Conservation</b> Conservation of Energy, re-use and recycle.	
9	<b>Global warming</b> Global warming, climate change and Ozone layer depletion.	
10	<b>Ground Water</b> Hydrological cycle, ground and surface water, Conservation and Harvesting of water	
11	<b>Environment</b> Right attitude towards environment, Maintenance of in -house environment	
	<b>Labour Welfare Legislation</b>	<b>5</b>
1	<b>Welfare Acts</b> Benefits guaranteed under various acts- Factories Act, Apprenticeship Act, Employees State Insurance Act (ESI), Payment Wages Act, Employees Provident Fund Act, The Workmen's compensation Act.	
	<b>Quality Tools</b>	<b>5</b>
1	<b>Quality Consciousness :</b> Meaning of quality, Quality Characteristic	
2	<b>Quality Circles :</b> Definition, Advantage of small group activity, objectives of quality Circle, Roles and function of Quality Circles in Organization, Operation of Quality circle. Approaches to starting Quality Circles, Steps for continuation Quality Circles.	
3	<b>Quality Management System :</b> Idea of ISO 9000 and BIS systems and its importance in maintaining qualities.	
4	<b>House Keeping :</b> Purpose of Housekeeping, Practice of good Housekeeping.	
5	<b>Quality Tools</b> Basic quality tools with a few examples	
	<b>Leadership and Team Building skills.</b>	<b>5</b>
1	Leadership Discipline and Morale Team Work Case Study/ Exercise	
2	<b>Meet the Mentor</b> <b>Role - play as a Supervisor</b>	<b>5</b>
	<b>Organizing and Planning.</b>	<b>5</b>
1	Time Management Group Dynamics Case Study/ Exercise	

**7.2 PRACTICAL TRAINING (ON-JOB TRAINING)  
(BLOCK – I&II)**

**DURATION: 18 MONTHS (9 months in each block)**

**GENERAL INFORMATION**

- 1) **Name of the Trade** : **HORTICULTURE ASSISTANT**
- 2) **Duration of On-Job Training** : As per Apprenticeship Act amended time to time.
- 3) **Batch size** : 16 Nos.
- 4) **Examination** : i) The internal assessment will be held on completion of each block  
ii) NCVT exam will be conducted at the end of 2<sup>nd</sup> year.
- 5) **Instructor Qualification** :

B.Sc in Agriculture (with elective Horticulture)/ B.Sc Horticulture from recognized university with one year experience in Horticulture.

**OR**

NTC/NAC in the trade of Mechanic Tractor with three year post qualification experience in the relevant field.

Preference will be given to a candidate with Craft Instructor Certificate (CIC)

- 6) **Tools, Equipment's & Machinery required** : - As per Annexure – II

## 7.2.1 BROAD SKILL COMPONENT TO BE COVERED DURING ON-JOB TRAINING

### A. BLOCK – I

Week No	Practical
14-15	<ul style="list-style-type: none"> <li>• Identification of important fruit plants (evergreen and deciduous) with their varieties.</li> <li>• Acquaintance of Horticultural tools and implements and their practical utilization</li> </ul>
16-18	<ul style="list-style-type: none"> <li>• Identification of different farm machinery used in horticulture and their uses</li> <li>• Identification of nutritional disorders in Horticultural crops</li> <li>• Preparation of herbarium for vegetables, weeds, seasonal flowers, fruit crops</li> <li>• Calculate cost of cultivation of Horticultural crops</li> </ul>
19-20	Collect of soil samples separately from each soil layer i.e. for top 15 cm, 15-30 cm, 30-60 cm, 60-90 cm, 90-120 cm, 120-200 cm. Put soil samples in separate clean cloth bags. Label each bag and should be send to soil testing laboratory. Trainee should analysis the soil testing report
21-24	<p>Planning and Orchard layout: methods of layout: square, rectangular, quincunx, hexagonal, contour, triangular systems, These systems should be demonstrated practically at farmer's field with the help of rope, poles, pegs, cross staff, measuring tape and planting board etc. Layout an orchard with different systems. Significance of wind break/fencing. Layout of kitchen garden (Vegetables and Fruit crops).</p> <p>Trainees should calculate the number of plants per acre according to different methods of layout on the basis of fruit plant. Digging of pits (1 x 1 x 1 m). Preparation of potting mixture, potting, de-potting &amp; repotting of containers, filling of pits.</p>
25	Seed dormancy and methods of breaking seed dormancy: scarification and stratification. Seed and media treatment. Calculation and preparation of growth regulators solution for foliar sprays. Extraction of seeds, procurement of root stocks etc
26-27	Seed treatments for breaking seed dormancy, soil sterilization (fungicides, sterilizers) and solarization, preparation of potting mixture (FYM, sand, coco peat, vermiculite, perlite), filling of potting mixture, preparation of seed and nursery beds; sowing of seeds on nursery beds, transplanting of seedlings, Preparation of potting mixtures for propagation of plants, role of planting board, methods for layout. Application of manure & fertilizers in Horticultural crops.
28-30	Layout of drip, sprinkler, check basin, surface and sub surface irrigation methods. Estimation of water and irrigation for Horticultural crops.
31	Maintenance of mother trees, collection of scion wood, certification and nursery registration Act.
32	Practicing and raising of different types of cuttings methods in the nursery in different Horticultural crops
33-34	Practicing and raising of different type of layering and budding methods in the nursery in different Horticultural crops
35-36	Practicing and raising of different types of grafting methods in the nursery in different Horticultural crops
37	Propagation through corms, runners, suckers etc in different Horticultural crops
38-39	Uprooting/digging/labeling and packing of nursery plants. Maintenance of nursery and orchard records.
40-	Demonstration and application of nutrients, insecticides, weedicides and fungicides in fruit

42	nursery/orchards with spray equipment/pumps. Identification of insects and diseases in fruit crops. Study of IPM model in horticultural crops
43-45	Training and pruning of evergreen and deciduous fruit crops
46	Preventive and periodic maintenance of tractor and Implements. Project preparation for establishing commercial orchards.
47-49	Maturity indices, harvesting, grading, packaging and storage of different fruit crops. Waxing, grading and packing of fruit crops. Ripening techniques in various Horticultural crops. Visit to post harvest Lab, waxing, grading and pack houses in the state
50	Revision of the syllabus
51	Exposure visit to orchards, Vegetable farm, accredited fruit plant nurseries, Universities, ICAR institutes etc.
52	Test

## B. BLOCK – II

Week No.	Practical
14-15	<ul style="list-style-type: none"><li>• Identification of important vegetables seeds/varieties, ornamental trees, shrubs, climbers, palms, seasonal flowers, creepers, indoor plants, foliage plants, grasses, cacti and succulents.</li><li>• Identification of horticultural tools and their practical utilization</li></ul>
16-19	<ul style="list-style-type: none"><li>• Identification of farm power machinery and their uses</li><li>• Identification of nutritional disorders in Horticultural crops</li><li>• Identification of Rabi and Kharif weeds</li></ul>
20-22	Layout of special types of gardens, rock garden, preparation of land and planting for lawn and their maintenance. Seed production for seasonal ornamental flowers.
23-26	Planning and designing of garden structures – boundary, hedges, flower beds, flower beds, carpet garden; house garden etc.
27-28	Practicing for flower arrangement, dry flower and bouquet, bonsai creation
29-32	Preparation of seed beds, raising of nurseries of different types of seasonal and vegetables crops in trays, seed beds under open and protected conditions. Growing vegetables and flowers under protected cultivation (low tunnel, polyhouse, net house. Protection of horticultural crops against adverse weather conditions
33-35	Production of hybrid seeds in chilli, brinjal, tomato and muskmelon. Techniques for selfing and crossing, bagging emaculation, pollen collection and storage, seed extraction, seed plot techniques.
36-38	Maturity indices, harvesting, grading, packaging and storage of different vegetable crops. Visit to post harvest Lab, waxing, grading and pack houses in the state. Value added products from horticultural crops like jam, pickles, RTS, marmalades, squashes, vinegar, tomato ketch up, sauces, French fries, candies, puree, chutneys etc.
39-41	Demonstration and application of nutrients, insecticides, weedicides and fungicides in fruit nursery/orchards with spray equipments/pumps. Identification of insects and diseases in fruit crops.
42-43	Study of IPM model in horticultural crops
44-45	Visit to commercial vegetable farms. Intercultural operations in vegetable plots. Seed production in vegetable crops.
46	Preventive and periodic maintenance of tractor and Implements.
47-48	Sale of raised nurseries of vegetable crops and ornamental seasonal flowers, recording keeping for nurseries etc
49	Calculation of Benefit cost ratio
50	Exposure visit to orchards, Vegetable farm, accredited fruit plant nurseries, Universities, ICAR institutes etc.
51	Revision of the syllabus
52	Test



## 8. ASSESSMENT STANDARD

### 8.1 Assessment Guideline:

Appropriate arrangements should be made to ensure that there will be no artificial barriers to assessment. The nature of special needs should be taken into account while undertaking assessment. Due consideration to be given while assessing for team work, avoidance/reduction of wastage and disposal of wastage as per procedure, behavioral attitude and regularity in training.

The following marking pattern to be adopted while assessing:

**a)**Weightage in the range of 60-75% to be allotted during assessment under following performance level:

For this grade, the candidate with occasional guidance and showing due regard for safety procedures and practices, has produced work which demonstrates attainment of an acceptable standard of craftsmanship.

In this work there is evidence of:

- Good skill levels in the use of hand tools, machine tools and workshop equipment
- Many tolerances while undertaking different work are in line with those demanded by the component/job.
- A fairly good level of neatness and consistency in the job.
- Occasional support in completing the project/job.

**b)**Weightage in the range of above75%- 90% to be allotted during assessment under following performance level:

For this grade, the candidate, with little guidance and showing due regard for safety procedures and practices, has produced work which demonstrates attainment of a reasonable standard of craftsmanship.

In this work there is evidence of:

- Good skill levels in the use of hand tools, machine tools and workshop equipment
- The majority of tolerances while undertaking different work are in line with those demanded by the component/job.
- A good level of neatness and consistency in the finish
- Little support in completing the project/job

c)Weightage in the range of above 90% to be allotted during assessment under following performance level:

For performance in this grade, the candidate, with minimal or no support in organization and execution and with due regard for safety procedures and practices, has produced work which demonstrates attainment of a high standard of craftsmanship.

In this work there is evidence of:

- high skill levels in the use of hand tools, machine tools and workshop equipment
- Tolerances while undertaking different work being substantially in line with those demanded by the component/job.
- a high level of neatness and consistency in the finish.
- minimal or no support in completing the project

**8.2 FINAL ASSESSMENT- ALL INDIA TRADE TEST (SUMMATIVE ASSESSMENT FOR TWO YEARS TRADE)**

SUBJECTS	Marks	Internal assessment based on competency	Full Marks	Pass Marks	Duration of Exam.
Basic Training(Block-I)		<b>250</b>	<b>250</b>	<b>150</b>	
Professional Skill	250		250	150	<b>08 hrs.</b>
Professional Knowledge	100		100	40	3 hrs.
Workshop Cal. & Sc.	50		50	20	3 hrs.
Engineering Drawing	50		50	20	4 hrs.
Employability Skill	50		50	20	3 hrs.
Basic Training (Block-II)		<b>250</b>	<b>250</b>	<b>150</b>	
<b>Grand Total</b>	<b>500</b>	<b>500</b>	<b>1000</b>	<b>550</b>	

## 9. FURTHER LEARNING PATHWAYS

- On successful completion of the course trainees can opt for Diploma course (Lateral entry).
- On successful completion of the course trainees can opt for CITS course.

### **Employment opportunities:**

On successful completion of this course, the candidates shall be gainfully employed in the following industries:

1. Agro service centres.
2. Orchards and related industry
3. Service in Horticulture
4. Self employment

**TOOLS & EQUIPMENT FOR BASIC TRAINING****INFRASTRUCTURE FOR PROFESSIONAL SKILL & PROFESSIONAL  
KNOWLEDGE****TRADE:HORTICULTURE ASSISTANT****LIST OF TOOLS & EQUIPMENTS FOR 16 APPRENTICES****A: TRAINEES TOOL KIT:-****A. TRAINEES TOOL KIT**

<b>Sl.No.</b>	<b>Item with specification</b>	<b>Qty (Nos.)</b>
1.	Apron	20
2.	Zindra	05
3.	Spade	20
4.	Sickle	20
5.	Khurpa	20
6.	Kasola	20
7.	Trifali	20
8.	Wheel hand hoe	05
9.	Dori (nylon rope)	100 m
10.	Measuring tape	04
11	Horticultural tool kit	02
12	Shovel	01
13	Ladders	02
14	Power pruner	01
15	Secateurs	20
16	Girdling knife	02
17	Plant lifter	04
18	Pruning saw	20
19	Tree pruner	04
20	Budding knives	20
21	Planting board	01
22	Rakes	05
23	Watering Can	05
24	Plastic irrigation pipes	200 m

**B. Tools Instruments and General Shop outfits**

<b>Sl.No.</b>	<b>Item with specification</b>	<b>Qty (Nos.)</b>
1.	pH meter	02
2.	Electrical conductivity meter	02
3.	Sieves	10
4.	Ordinary physical balance	02
5.	Sampling tools (augers)	05

**C. General Installation/Machinery**

Sl.No.	Item with specification	Qty (Nos.)
1.	Orchard tractor	01
2.	Seed cum fertilizer drill	01
3.	Manual seed drill	01
4.	Manual multi crop planter	01
5.	Bed planter	01
6.	Ridger	01
7.	Tractor	01
8.	Cultivator	01
9.	Disc harrow	01
10.	Planker	01
11.	Kanapsack sprayer	05
12.	Foot operated sprayer	02
13.	Drip irrigation system	01
14.	Sprinkler system	01
15.	Harvesting tools	01
16.	Post hole digger	01
17.	Tractor Power mounted sprayer	01
18.	Field for raising Horticultural crops	3.0 to 5.0 acres

#### D. List of Consumable

Sl.No.	Description	Qty (Nos.)
1.	Seeds/ orchard plants (different Rabi and Kharif crops)	As per requirement
2.	Fertilizers (FYM, Urea,DAP,SSP,MOPetc)	-do-
3.	Spraying chemicals	-do-

#### E. Workshop Furniture

Sl.No.	Description	Qty (Nos.)
1.	Computer Chair	1+1
2.	Computer Table	1+1
3.	Desktop computer and related MS office software	1+1
4.	Fire Extinguishers, first- aid box	One each
5.	Internet connection with all accessories	As required
6.	Laser printer	1
7.	LCD projector/ LED /LCD TV (42")	1
8.	Stools	20
9.	Suitable class room furniture	As required
10.	Suitable Work Tables with vices	As required
11.	Trainees locker 6½ ' x 3' x 1½'	2 Nos. to accommodate 20 Lockers

**INFRASTRUCTURE FOR WORKSHOP CALCULATION & SCIENCE AND  
ENGINEERING DRAWING**

**TRADE: HORTICULTURE ASSISTANT**

**LIST OF TOOLS& EQUIPMENTS FOR 16 APPRENTICES**

1) **Space Norms** : 45 Sq.m.(For Engineering Drawing)

2) **Infrastructure:**

**A : TRAINEES TOOL KIT:-**

<b>Sl. No.</b>	<b>Name of the items</b>	<b>Quantity (indicative)</b>
1.	Draughtsman drawing instrument box	16
2.	Set square celluloid 45 <sup>0</sup> (250 X 1.5 mm)	16
3.	Set square celluloid 30 <sup>0</sup> -60 <sup>0</sup> (250 X 1.5 mm)	16
4.	Mini drafter	16
5.	Drawing board (700mm x500 mm) IS: 1444	16

**B : FURNITURE REQUIRED**

<b>Sl. No.</b>	<b>Name of the items</b>	<b>Quantity (indicative)</b>
1	Drawing Board	20
2	Models : Solid & cut section	as required
3	Drawing Table for trainees	as required
4	Stool for trainees	as required
5	Cupboard (big)	01
6	White Board (size: 8ft. x 4ft.)	01
7	Trainer's Table	01
8	Trainer's Chair	01

**TOOLS & EQUIPMENT FOR ON-JOB TRAINING**

**INFRASTRUCTURE FOR PROFESSIONAL SKILLS &  
PROFESSIONAL KNOWLEDGE**

**TRADE: HORTICULTURE ASSISTANT**

**For Batch of 16 APPRENTICES**

**General Machinery Installations –**

<b>Sl. No.</b>	<b>Name &amp; Description of Machines</b>	<b>Quantity</b>
1	Diesel engine (Running condition) Stationary type with generator set 4 Cylinder.	1
2	Multi Scan Tool with oscilloscope	1
3	Working Condition of Diesel Engine – CRDI - 4 stroke Engine Assembly with fault simulation board (vehicular model)	1
4	Drilling machine (general purpose)	1
5	Fuel Injection pump Test bench (in-line and Rotary pumps)	1
6	Fuel Injection pump Test bench (CRDI)	1



**GUIDELINES FOR INSTRUCTORS AND PAPER SETTERS**

1. Due care to be taken for proper & inclusive delivery among the batch. Some of the following some method of delivery may be adopted:

- A) LECTURE
- B) LESSON
- C) DEMONSTRATION
- D) PRACTICE
- E) GROUP DISCUSSION
- F) DISCUSSION WITH PEER GROUP
- G) PROJECT WORK
- H) INDUSTRIAL VISIT

2. Maximum utilization of latest form of training viz., audio visual aids, integration of IT, etc. may be adopted.

3. The total hours to be devoted against each topic may be decided with due diligence to safety & with prioritizing transfer of required skills.