



# Model Curriculum

**QP Name: Chilling Plant Technician**

**QP Code: AGR/Q4205**

**QP Version: 3.0**

**NSQF Level: 4**

**Model Curriculum Version: 2.0**

Agriculture Skill Council of India || Agriculture Skill Council of India (ASCI), 6th Floor, GNG Tower, Plot No. 11, Sector -44

# Table of Contents

Training Parameters.....	3
Program Overview .....	5
Compulsory Modules .....	5
Module Details.....	7
Module 1: Introduction to the role of Chilling Plant Technician.....	7
Module 2: Process of preparing and maintaining work area and chilling plant .....	8
Module 3: Process of proper installation and starting of chilling plant.....	9
Module 4: Process of storage milk in the chilling containers .....	10
Module 5: Process of inspection and maintenance of chilling plant .....	11
Module 8: Employability Skills (60 hours).....	14
Module 9: On-the-Job Training .....	16
Annexure.....	17
Trainer Requirements .....	17
Assessor Requirements.....	18
Testing Environment .....	20
Assessment Quality Assurance framework.....	21

## Training Parameters

<b>Sector</b>	Agriculture & Allied
<b>Sub-Sector</b>	Dairying
<b>Occupation</b>	Milk collection and handling
<b>Country</b>	India
<b>NSQF Level</b>	4
<b>Aligned to NCO/ISCO/ISIC Code</b>	NCO-2015/8160
<b>Minimum Educational Qualification and Experience</b>	Minimum Educational Qualification: 12th grade pass OR Completed 2nd year of 3-year diploma (after 10th) and pursuing regular diploma OR 10th grade pass plus 2-year NTC OR 10th grade pass plus 1-year NTC plus 1 year NAC OR 8th pass plus 2-year NTC plus 1-Year NAC plus CITS OR 10th grade pass and pursuing continuous schooling OR 10th Grade Pass with 2-year relevant experience OR Previous relevant Qualification of NSQF Level 3.0 with minimum education as 8th Grade pass with 3- year relevant experience OR Previous relevant Qualification of NSQF Level 3.5 with 1.5- year relevant experience
<b>Pre-Requisite License or Training</b>	N/A
<b>Minimum Job Entry Age</b>	18 Years
<b>Last Reviewed On</b>	31-03-2022
<b>Next Review Date</b>	31-03-2025
<b>NSQC Approval Date</b>	31-03-2022
<b>QP Version</b>	3.0

<b>Model Curriculum Creation Date</b>	31-03-2022
<b>Model Curriculum Valid Up to Date</b>	31-03-2025
<b>Model Curriculum Version</b>	2.0
<b>Minimum Duration of the Course</b>	390 Hours
<b>Maximum Duration of the Course</b>	390 Hours

## Program Overview

This section summarizes the end objectives of the program along with its duration.

### Training Outcomes

At the end of the program, the learner should have acquired the listed knowledge and skills to:

Demonstrate preparing and maintaining work area and equipment

Demonstrate receiving milk at chilling plant and conducting minor repair and maintenance of equipment

Demonstrate installation of chilling unit, start-up of chilling system, storage of milk and testing of milk

Describe the process of maintaining document and record keeping of milk stored, storage parameters and chilling system in chilling unit

Demonstrate safety and sanitation related function and safety practices of chilling plant

### Compulsory Modules

The table lists the modules and their duration corresponding to the Compulsory NOS of the QP.

NOS and Module Details	Theory Duration	Practical Duration	On-the-Job Training Duration (Mandatory)	On-the-Job Training Duration (Recommended)	Total Duration
<b>AGR/N4220 - Prepare and maintain work area and chilling equipment</b> NOS Version No. 1.0 NSQF Level 4	30:00	30:00	0:00	0:00	60:00
Module 1: Introduction to the role of Chilling Plant Technician	05:00	00:00	0:00	0:00	05:00
Module 2: Process of preparing and maintaining work area and chilling plant	25:00	30:00	0:00	0:00	55:00
<b>AGR/N4221 - Handle refrigeration unit for chilling and storing milk</b> NOS Version No. 1.0 NSQF Level 4	30:00	60:00	0:00	0:00	90:00
Module 3: Process of proper installation and starting of chilling plant	20:00	40:00	0:00	0:00	60:00
Module 4: Process of storage milk in the chilling containers	05:00	10:00	0:00	0:00	15:00

Module 5: Process inspection and maintenance of chilling plant	05:00	10:00	0:00	0:00	15:00
<b>AGR/N4222 - Complete Documentation and record keeping related to the chilling plant</b> <b>NOS Version No. 1.0</b> <b>NSQF Level 4</b>	<b>10:00</b>	<b>20:00</b>	<b>0:00</b>	<b>0:00</b>	<b>30:00</b>
Module 6: Process of documentation and record keeping related to the chilling plant	10:00	20:00	0:00	0:00	50:00
<b>AGR/N4223 - Safety, hygiene and sanitation for storing milk in Chilling plant</b> <b>NOS Version No. 1.0</b> <b>NSQF Level 4</b>	<b>20:00</b>	<b>10:00</b>	<b>0:00</b>	<b>0:00</b>	<b>30:00</b>
Module 7: Maintaining safety, hygiene and sanitation for storing milk in Chilling plant	20:00	10:00	0:00	0:00	30:00
<b>DGT/VSQ/N0102 Employability Skills</b> <b>NOS Version-1.0</b> <b>NSQF Level-4</b>	<b>60:00</b>	<b>00:00</b>	<b>0:00</b>	<b>0:00</b>	<b>60:00</b>
Module 8: Employability Skills	60:00	00:00	0:00	0:00	60:00
Module 9: OJT	00:00	00:00	120:00	00:00	120:00
<b>Total Duration</b>	<b>150:00</b>	<b>120:00</b>	<b>120:00</b>	<b>0:00</b>	<b>390:00</b>

## Module Details

### Module 1: Introduction to the role of Chilling Plant Technician

*Bridge Module, Mapped to NOS AGR/N4220 v1.0*

#### Terminal Outcomes:

- Describe the roles and responsibilities of Chilling Plant Technician

<b>Duration:</b> 05:00	<b>Duration:</b> 00:00
<b>Theory – Key Learning Outcomes</b>	<b>Practical – Key Learning Outcomes</b>
<ul style="list-style-type: none"> <li>Describe the size and scope of the Dairy Industry and its market</li> <li>Discuss the roles and responsibilities of a Chilling Plant Technician</li> <li>Describe various employment opportunities and career progression for Chilling Plant Technician</li> <li>Discuss basic reading capabilities to enable reading of signs, notices and/or cautions at site</li> <li>Explain the process of milk procurement</li> <li>Explain the importance of cooling the milk in a stipulated time after the procurement</li> <li>Discuss the concept of clean and antibiotic free milk</li> <li>List types of synthetic milk and its effects on human health</li> <li>Explain emerging dimension for dairy business (viz. market technology and innovation)</li> </ul>	
<b>Classroom Aids:</b>	
Laptop, White Board, Marker, Projector	
<b>Tools, Equipment and Other Requirements</b>	

## Module 2: Process of preparing and maintaining work area and chilling plant

*Mapped to NOS AGR/N4220 v1.0*

### Terminal Outcomes:

- Demonstrate the process of preparing the work area for chilling of milk
- Demonstrate the process of receiving milk at chilling plant
- Describe the process of maintaining the chilling plant

<b>Duration:</b> 25:00	<b>Duration:</b> 30:00
<b>Theory – Key Learning Outcomes</b>	<b>Practical – Key Learning Outcomes</b>
<ul style="list-style-type: none"> <li>• Enlist the types of chemicals, materials and equipment required for the cleaning and maintenance</li> <li>• Describe the cleaning process to disinfect equipment/ tools</li> <li>• Explain the supplier/manufacturer's instructions related to cleaning and maintenance</li> <li>• Describe the calibration procedure and method for equipment handling</li> <li>• Explain the Food safety Standards and Regulations (as per FSSAI)</li> <li>• Describe the legal regulations for maintaining health, safety and hygiene at the workplace</li> <li>• Describe the methods of waste disposal as per standards and in a eco-friendly way</li> </ul>	<ul style="list-style-type: none"> <li>• Demonstrate cleaning and maintenance of work area using approved chemicals and sanitizers</li> <li>• Demonstrate disposal of waste material as per organization standard and industry requirement</li> <li>• Demonstrate receiving milk at the chilling plant</li> <li>• Show how to plan the milk routes ensuring milk reaches chilling plant fresh and at the standard temperature</li> <li>• Demonstrate cooling of milk can during transit and before the reception</li> <li>• Show how to monitor the freshness of milk during summer condition</li> <li>• Show how to check the functioning and performance of the equipment in chilling plant facility</li> <li>• Demonstrate purging of non-condensable gases, including air from the chilling system</li> <li>• Demonstrate the purging of oil out of evaporators and receivers if it has solidified and is obstructing the flow of the refrigerant</li> <li>• Show how to check that evaporator coils are kept free of frost and refrigerant pipes are free of any clog and there is no ice inside the pipes</li> <li>• Demonstrate conducting minor repairs of all equipment</li> </ul>
<b>Classroom Aids:</b>	
Laptop, White Board, Marker, Projector	
<b>Tools, Equipment and Other Requirements</b>	
Sanitizers For Demonstration, Compressor, Conveyor Belt, Condenser, Evaporator, Fans, Sensors, Thermostat, Humidity Meter, Chiller	
Field visits (to the chilling plant) are must here	



## Module 3: Process of proper installation and starting of chilling plant

### Mapped to NOS AGR/N4221 v1.0

#### Terminal Outcomes:

- Describe the process of installing the chilling plant
- Demonstrate the process of starting the chilling plant

<b>Duration:</b> 20:00	<b>Duration:</b> 40:00
<b>Theory – Key Learning Outcomes</b>	<b>Practical – Key Learning Outcomes</b>
<ul style="list-style-type: none"> <li>• Describe the refrigeration principles, techniques and practices</li> <li>• Describe the dress code to be followed at the workplace</li> <li>• Describe the refrigeration system, components and their installation</li> <li>• Describe the SOP and guidelines for the installation of the chilling plant</li> <li>• Describe the procedure for starting of the chilling plant</li> <li>• Describe the methods to control temperature and humidity in the refrigeration unit</li> </ul>	<ul style="list-style-type: none"> <li>• Demonstrate proper installation of chilling unit, condense unit and mount evaporation coil evaporator</li> <li>• Show how to inspect the location to set up the chilling unit</li> <li>• Show how to calculate number of temperature sensors</li> <li>• Demonstrate how to use weight and sight glass indication</li> <li>• Demonstrate how to perform pre-start check up</li> <li>• Demonstrate how to start the chilling system by checking all the parts of the system like voltage, fans on the evaporator coil, defrost control, sensors and temperature measuring device</li> </ul>
<b>Classroom Aids:</b>	
Laptop, White Board, Marker, Projector	
<b>Tools, Equipment and Other Requirements</b>	
Field visits (to the chilling plant) are must here.	

## Module 4: Process of storage milk in the chilling containers

### Mapped to NOS AGR/N4221 v1.0

#### Terminal Outcomes:

- Demonstrate the process of storing milk in the chilling plant

<b>Duration: 05:00</b>	<b>Duration: 10:00</b>
<b>Theory – Key Learning Outcomes</b>	<b>Practical – Key Learning Outcomes</b>
<ul style="list-style-type: none"> <li>• Describe the storage process of milk in the chilling containers and calibration</li> <li>• Describe various procedures involved in chilling and storing milk</li> <li>• Explain the work order from the supervisor</li> <li>• Describe the guidelines and check-lists for strong milk in the chilling plant</li> <li>• Describe the procedure for reporting any malfunction in the machine and corrective actions to be taken</li> </ul>	<ul style="list-style-type: none"> <li>• Demonstrate arranging the cans on the conveyer belt by type of milk and supplier</li> <li>• Show how to undertake storage of milk in chilling containers following SOP</li> <li>• Show how to adjust control to set storage parameters for various requirements</li> <li>• Demonstrate pumping the milk from the holding tank through the line filter</li> <li>• Demonstrate how to test milk at chilling plants; collect and analyse milk and conduct test</li> <li>• Demonstrate testing the milk for Fat/SNF</li> <li>• Demonstrate reporting the malfunction to the supervisor</li> </ul>
<b>Classroom Aids:</b>	
Laptop, White Board, Marker, Projector	
<b>Tools, Equipment and Other Requirements</b>	
Field visits (to the chilling plant) are must here.	

## Module 5: Process of inspection and maintenance of chilling plant

*Mapped to NOS AGR/N4221 v1.0*

### Terminal Outcomes:

- Demonstrate the milk testing and inspection process of the chilling plant
- Describe the maintenance procedure of chilling plant and its components

<b>Duration:</b> 05:00	<b>Duration:</b> 10:00
<b>Theory – Key Learning Outcomes</b>	<b>Practical – Key Learning Outcomes</b>
<ul style="list-style-type: none"> <li>• Describe the various milk testing techniques</li> <li>• Explain the method of collecting milk samples</li> <li>• Describe the method to examine the operation of the chilling unit and charging refrigerant in the refrigeration system</li> <li>• Describe the process of dismantling, repairing, reassembling and testing components</li> <li>• Describe the supplier/manufacturer instructions related to refrigeration unit</li> <li>• Explain the risks associated with working in extreme temperature conditions and control measures</li> </ul>	<ul style="list-style-type: none"> <li>• Demonstrate how to test milk at chilling plants; collect and analyse milk and conduct test</li> <li>• Demonstrate marking/numbering and analysing the milk samples</li> <li>• Demonstrate how to inspect, repair/replace chilling system and components</li> <li>• Demonstrate identifying malfunctions of components</li> <li>• Demonstrate preventive maintenance of the system and components following the SOP</li> <li>• Demonstrate checking for all the requirements for the proper functioning of the system</li> <li>• Show how to clean the condenser</li> </ul>
<b>Classroom Aids:</b>	
Laptop, White Board, Marker, Projector	
<b>Tools, Equipment and Other Requirements</b>	
Field visits (to the chilling plant) are must here.	

## Module 6: Process of documentation and record keeping related to the chilling plant

*Mapped to NOS AGR/N4222 v1.0*

### Terminal Outcomes:

- Describe the documentation and record keeping procedure of stored milk
- Show how to maintain the record of storage parameters and chilling unit

<b>Duration: 10:00</b>	<b>Duration: 20:00</b>
<b>Theory – Key Learning Outcomes</b>	<b>Practical – Key Learning Outcomes</b>
<ul style="list-style-type: none"> <li>• Describe about the documentation system and methods of the organization</li> <li>• Describe the SOP for maintaining records all outgoing milk losses from incoming to the outgoing period</li> <li>• Enlist the details to be recorded and maintained on milk stored in chilling unit</li> <li>• Describe about ERP system</li> <li>• Enlist the details to be recorded and maintained on preventive maintenance, routine checks, service, repairs, replacements, etc.</li> </ul>	<ul style="list-style-type: none"> <li>• Show how to document and maintain records of stored milk in the chilling plant</li> <li>• Show the register and maintenance of records of storage parameters</li> <li>• Demonstrate entering details in the ERP system</li> <li>• Show how to register and maintain records of current chilling system in the chilling unit</li> <li>• Demonstrate verification of documents and track details in case of discrepancies or any other concern</li> <li>• Demonstrate documenting and maintaining the records of chilling plant system related operations</li> <li>• Demonstrate tracking and verifying of details in cases of concerns</li> <li>• Show how to maintain a records and observations and deviations</li> </ul>
<b>Classroom Aids:</b>	
Laptop, White Board, Marker, Projector	
<b>Tools, Equipment and Other Requirements</b>	

## Module 7: Maintaining safety, hygiene and sanitation for storing milk in Chilling plant

*Mapped to NOS AGR/N4223 v1.0*

### Terminal Outcomes:

- Describe the procedure for maintaining the safety and sanitation in a chilling plant
- Demonstrate safety practices for storage of milk in a chilling plant

Duration: 20:00	Duration: 10:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> <li>• Explain contamination and adulteration</li> <li>• Describe the organization methods for cleaning and sanitation of equipment and work area</li> <li>• Describe the CIP and COP methods procedure</li> <li>• Describe the FIFO and FEFO methods of storage norms and stock rotation</li> <li>• Explain the personal hygiene requirements and its importance</li> <li>• Describe the food safety and hygiene standards</li> <li>• Describe milk safety laws and regulation</li> <li>• Explain basic milk microbiology</li> <li>• Explain the hazard management</li> </ul>	<ul style="list-style-type: none"> <li>• Show how to maintain safety and hygiene as per the organization standard</li> <li>• Demonstrate safety and sanitation procedures to store milk in the chilling plant</li> <li>• Demonstrate following the housekeeping practices</li> <li>• Show how to determine the quality of milk</li> <li>• Show how to store and label procured milk, chemicals, allergens etc.</li> <li>• Demonstrate maintaining personal hygiene and wear safety gears</li> <li>• Demonstrate cleaning, maintaining and monitoring milk processing equipment</li> <li>• Show how to use safety equipment</li> <li>• Show how to check the quality of produce and prevent spoilage</li> <li>• Show how to store varieties of produce, chemicals and gases safely to prevent cross-contamination</li> </ul>
<b>Classroom Aids:</b>	
Laptop, White Board, Marker, Projector	
<b>Tools, Equipment and Other Requirements</b>	
Sanitizer, Personal Protective Equipment Like: Safety Gloves, Safety Boots, Hairnet, First Aid Kit: Bandages, Adhesive Bandages, Betadine Solution / Ointment, Pain Relief Spray / Ointment, Antiseptic Liquid; Antidote, Phone Directory, Search Lights, Fire Extinguisher	

## Module 8: Employability Skills (60 hours)

*Mapped to NOS DGT/VSQ/N0102 v1.0*

**Duration: 60:00**

### Key Learning Outcomes

#### Introduction to Employability Skills Duration: 1.5 Hours

After completing this programme, participants will be able to:

1. Discuss the Employability Skills required for jobs in various industries
2. List different learning and employability related GOI and private portals and their usage

#### Constitutional values - Citizenship Duration: 1.5 Hours

3. Explain the constitutional values, including civic rights and duties, citizenship, responsibility towards society and personal values and ethics such as honesty, integrity, caring and respecting others that are required to become a responsible citizen
4. Show how to practice different environmentally sustainable practices.

#### Becoming a Professional in the 21st Century Duration: 2.5 Hours

5. Discuss importance of relevant 21st century skills.
6. Exhibit 21st century skills like Self-Awareness, Behavior Skills, time management, critical and adaptive thinking, problem-solving, creative thinking, social and cultural awareness, emotional awareness, learning to learn etc. in personal or professional life.
7. Describe the benefits of continuous learning.

#### Basic English Skills Duration: 10 Hours

8. Show how to use basic English sentences for everyday conversation in different contexts, in person and over the telephone
9. Read and interpret text written in basic English
10. Write a short note/paragraph / letter/e -mail using basic English

#### Career Development & Goal Setting Duration: 2 Hours

11. Create a career development plan with well-defined short- and long-term goals

#### Communication Skills Duration: 5 Hours

12. Demonstrate how to communicate effectively using verbal and nonverbal communication etiquette.
13. Explain the importance of active listening for effective communication
14. Discuss the significance of working collaboratively with others in a team

#### Diversity & Inclusion Duration: 2.5 Hours

15. Demonstrate how to behave, communicate, and conduct oneself appropriately with all genders and PwD
16. Discuss the significance of escalating sexual harassment issues as per POSH act.

#### Financial and Legal Literacy Duration: 5 Hours

17. Outline the importance of selecting the right financial institution, product, and service
18. Demonstrate how to carry out offline and online financial transactions, safely and securely
19. List the common components of salary and compute income, expenditure, taxes, investments etc.
20. Discuss the legal rights, laws, and aids

**Essential Digital Skills Duration: 10 Hours**

21. Describe the role of digital technology in today's life
22. Demonstrate how to operate digital devices and use the associated applications and features, safely and securely
23. Discuss the significance of displaying responsible online behavior while browsing, using various social media platforms, e-mails, etc., safely and securely
24. Create sample word documents, excel sheets and presentations using basic features
25. utilize virtual collaboration tools to work effectively

**Entrepreneurship Duration: 7 Hours**

26. Explain the types of entrepreneurship and enterprises
27. Discuss how to identify opportunities for potential business, sources of funding and associated financial and legal risks with its mitigation plan
28. Describe the 4Ps of Marketing-Product, Price, Place and Promotion and apply them as per requirement
29. Create a sample business plan, for the selected business opportunity

**Customer Service Duration: 5 Hours**

30. Describe the significance of analysing different types and needs of customers
31. Explain the significance of identifying customer needs and responding to them in a professional manner.
32. Discuss the significance of maintaining hygiene and dressing appropriately

**Getting Ready for apprenticeship & Jobs Duration: 8 Hours**

33. Create a professional Curriculum Vitae (CV)
34. Use various offline and online job search sources such as employment exchanges, recruitment agencies, and job portals respectively
35. Discuss the significance of maintaining hygiene and confidence during an interview
36. Perform a mock interview
37. List the steps for searching and registering for apprenticeship opportunities

## Module 9: On-the-Job Training

### Mapped to Chilling Plant Technician

<b>Mandatory Duration: 120:00</b>	<b>Recommended Duration: 00:00</b>
<b>Location: On Site</b>	
<b>Terminal Outcomes</b> <ul style="list-style-type: none"> <li>• Show how to Communicate effectively at the workplace with internal and external stakeholders</li> <li>• Carry out commercial activities such as buying and selling dairy related products using the appropriate e-commerce platforms or from authorized vendor</li> <li>• Process payments using the relevant e-payment method.</li> <li>• Prepare training schedule for an apprentice.</li> <li>• Explain the requirements of personal health, hygiene and fitness at work.</li> <li>• Discuss the industry recommended practices for the safe utilization of dairy products</li> <li>• Implement the practices related to gender and PwD sensitization.</li> </ul>	



# Annexure

## Trainer Requirements

Job Role Name	Minimum Educational Qualification of the Trainer	Specialization	Relevant Industry Experience		Training Experience		Remarks
			Years	Specialization	Years	Specialization	
Chilling Plant Technician	Diploma	Veterinary /Animal Husbandry / Dairying	5	Chilling Plant operations	0		Regular Diploma more than 15 months in veterinary /Animal Husbandry / Dairying
Chilling Plant Technician	Graduate	Science	2	Chilling Plant operations	0		
Chilling Plant Technician	B. Tech	Dairy / Electrical / Mechanical	1	Chilling Plant operations	0		

Trainer Certification	
Domain Certification	Platform Certification
Certified for Job Role: "Chilling Plant Technician" mapped to QP: "AGR/Q4205, v3.0". Minimum accepted score is 80%.	Certified for the Job Role: "Trainer (Vet and Skills)", mapped to the Qualification Pack: "MEP/Q2601 v2.0". Minimum accepted % as per respective SSC guidelines is 80%.

## Assessor Requirements

Assessor Prerequisites - Chilling Plant Technician						
Minimum Educational Qualification	Specialization	Relevant Industry Experience		Training/Assessment Experience		Remarks
		Years	Specialization	Years	Specialization	
B. V. Sc.		4	In Dairy Science/Animal Science/Veterinary Science or related streams	0		Practical skills and knowledge required in operation and maintenance of Chilling plants
B. Tech	Dairy and related stream	4	In Dairy Science/Animal Science/Veterinary Science or related streams	0		Practical skills and knowledge required in operation and maintenance of Chilling plants
B. Sc	Animal Sciences/ Dairy Science/ Dairy Technology	5	In Dairy Science/Animal Science/Veterinary Science or related streams	0		Practical skills and knowledge required in operation and maintenance of Chilling plants
M. V. Sc		2	In Dairy Science/Animal Science/Veterinary Science or related streams	0		Practical skills and knowledge required in operation and maintenance of Chilling plants
M Sc	Animal Science/Dairy Science/Dairy Technology	2	In Dairy Science/Animal Science/Veterinary Science or related streams	0		Practical skills and knowledge required in operation and maintenance of Chilling plants

Ph.D	Animal Science/ Veterinary Science/Dairy Technology/Dairy Science	1	In Dairy Science/Animal Science/Veterinary Science or related streams	0	Practical skills and knowledge required in operation and maintenance of Chilling plants
------	---	---	---	---	---

Assessor Certification	
Domain Certification	Platform Certification
Certified for Job Role: “Chilling Plant Technician” mapped to QP: “AGR/Q4205, v3.0”. Minimum accepted score is 80%.	Certified for the Job Role: “Trainer (Vet and Skills)”, mapped to the Qualification Pack: “MEP/Q2601 v2.0”. Minimum accepted % as per respective SSC guidelines is 80%.

## Assessment Strategy

### Assessment System Overview

In Agriculture Sector it is of ultimate importance that individuals dealing with crop production or livestock have the requisite knowledge and competencies to undertake the task. Based on the Assessment Criteria, SSC in association with empaneled AAs, define the test structure for the given job roles to cover the required skills and competencies. Assessment strategy consists of the following:

1. Multiple Choice Questions: To assess basic knowledge (Objective/Subjective)
2. Viva: To assess awareness on processes (Oral and/or written questioning)
3. Practical: To evaluate skills and identify competencies. (Observation)

Assessments for knowledge and awareness on processes may be conducted through 'real time' internet based evaluation or by conducting the same 'offline' through TABs. Skills and competencies are to be assessed by conducting 'practical' on ground through qualified and ToA certified assessors.

While it is important that an individual has adequate knowledge and skills to perform a specific task, weight age for different aspects for assessment are given as follows:

Multiple Choice Questions: 20%-30%, depending on the specific QP

Viva: 20%

Practical: 50% - 60% (Involves demonstrations of applications and presentations of procedures/tasks and other components)

Assessment will be carried out by certified assessors through empaneled assessment partners. Based on the results of assessment; ASCI will certify the learners/candidates

### Testing Environment

Assessments are conducted on laptops, Mobiles and android tablets via both offline and online mode depending on the internet connectivity at assessment location.

In remote locations/villages, assessments get delivered through tablets without the requirement of Internet.

- Multilingual assessments (ASCI is conducting assessments in 13 + languages pan India)
- Rubric driven assessments in Practical/Viva sections and responses recorded accordingly
- All responses, data, records and feedback stored digitally on cloud
- Advanced auto-proctoring features – photographs, time-stamp, geographic-tagging, toggle-screen/copy-paste disabled, etc.
- Android based monitoring system
- End to end process from allocation of a batch to final result upload, there is no manual

intervention

- Assessment will normally be fixed for a day after the end date of training / within 7 days of completion of training.
- Assessment will be conducted at the training venue
- Room where assessment is conducted will be set with proper seating arrangements with enough space to curb copying or other unethical activities
- Question bank of theory and practical will be prepared by ASCI /assessment agency and approved ASCI. Only from approved Question Bank assessment agency will prepare the question paper. Theory testing will include multiple choice questions, pictorial question, etc. which will test the trainee on his theoretical knowledge of the subject.
- The theory, practical and viva assessments will be carried out on same day. In case of more number of candidates, number of assessors and venue facilitation be increased and facilitated

Assessment			
Assessment Type	Formative or Summative	Strategies	Examples
Theory	Summative	MCQ/Written exam	Knowledge of facts related to the job role and functions. Understanding of principles and concepts related to the job role and functions
Practical	Summative	Structured tasks/Demonstration	Practical application /Demonstration /Application tasks
Viva	Summative	Questioning and Probing	Mock interviews on usability of job roles/advantages /importance of adherence to procedures. Viva will be used to gauge trainee's confidence and correct knowledge in handling job situation

The question paper pre-loaded in the computer /Tablet and it will be in the language as requested by the training partner.

### Assessment Quality Assurance framework

**Assessment Framework and Design:** Based on the Assessment Criteria, SSC in association with AAs will define the test structure for the given roles to cover the required skills and competencies. ASCI offer a bouquet of tools for multi- dimensional evaluation of candidates covering language, cognitive skills, behavioral traits and domain knowledge.

**Theoretical Knowledge** - Item constructs and types are determined by theoretical understanding of the testing objectives and published research about the item-types and constructs that have shown statistical validity towards measuring the construct. Test item types which have been reported to be coachable are not included. Based on these, items are developed by domain experts. They are provided with comprehensive guidelines of testing objectives of each question and other quality measures.

**Type** – Questions based on Knowledge Required, Case-based practical scenario questions and automated simulation based questions.

**Practical Skills** - The practical assessments are developed taking into consideration two aspects: what practical tasks is the candidate expected to perform on the job and what aspects of the job cannot be judged through theoretical assessments. The candidates shall be asked to perform either an entire task or a set of subtasks depending on the nature of the job role

**Type** – Standardized rubrics for evaluation against set of tasks in a demo/practical task

**Viva Voce** - Those practical tasks which cannot be performed due to time or resource constraints are evaluated through the viva mode. Practical tasks are backed up with Viva for thorough assessment and complete evaluation

**Type** – Procedural questions, Do's & Don'ts, subjective questions to check understanding of practical tasks.

Assessor has to go through orientation program organized by Assessment Agency. The training would give an overview to the assessors on the overall framework of QP evaluation. Assessor shall be given a NOS and PC level overview of each QP as applicable. Overall structure of assessment and objectivity of the marking scheme will be explained to them. The giving of marks will be driven by an objective framework which will maintain standardization of marking scheme.

**Type of Evidence and Evidence Gathering Protocol:**

During the assessment the evidences collected by AAs and ASCI are:

- Geo Tagging to track ongoing assessment
- AA's coordinator emails the list of documents and evidences (photos and videos) to the assessor one day prior to the assessment. List is mentioned below:
  - Signed Attendance sheet
  - Assessor feedback sheet
  - Candidate feedback sheet
  - Assessment checklist for assessor
  - Candidate Aadhar/ID card verification
  - Pictures of classroom, labs to check the availability of adequate equipment's and tool to conduct the training and assessment
  - Pictures and videos of Assessment, training feedback and infrastructure.
- Apart from the Assessor, Technical assistant popularly known as Proctor also ensures the proper documentation and they verify each other's tasks.
- To validate their work on the day of assessment, regular calls and video calls are done.
- On-boarding and training of assessor and proctor is done on timely basis to ensure that quality of the assessment should be maintained.
- Training covers the understanding of QP, NSQF level, NOS and assessment structure

**Methods of Validation**

- Morning Check (Pre-Assessment): Backend team of AA calls and confirms assessor/technical SPOC event status. Assessor/Technical SPOC are instructed to reach the centre on time by 9:30 AM / as decided with TC and delay should be highlighted to the Training Partner in advance.
- Video Calls: Random video calls are made to the technical SPOC/assessor so as to keep check on assessment quality and ensure assessment is carried out in fair and transparent manner
- Aadhar verification of candidates

- **Evening Check (Post Assessment):** Calls are made to the ground team to ensure event is over by what time and the documentation is done in proper manner or not.
- **TP Calling:** To keep check on malpractice activity, independent audit team calls to TP on recorded line to take confirmation if there was any malpractice activity observed in assessment on part of AA/SSC team. If calls are not connected, email is sent to TP SPOC for taking their confirmation
- **Video and Picture Evidence:** Backend team collects video and pictures for assessment on real time basis and highlights any issue like, Students sitting idle/trainer allowed for helping out candidates during assessment.
- **Surprise Visit:** Time to time SSC/AA Audit team can visit the assessment location and do surprise audit for assessment process carried out by ground team.
- **Geo Tagging:** On day of assessment, each technical SPOC is required to login in our internal app which is Geo tagged. Any deviation with centre address needs to be highlighted to assessment team on real-time basis.

#### **Method for assessment documentation, archiving, and Access:**

- ASCI has fully automated result generation process in association with multiple AAs
- Theory, Practical and Viva marks forms the basis of the results and encrypted files generated to avoid data manipulation. All responses captured and stored in System with Time-Stamps at the end of AAs and SSC. NOS-wise and PC-wise scores can be generated.
- Maker Checker concept: 1 person prepares results and other audit result which is internally approved by AA at first and then gets vetted at the end of SSC
- All soft copy of documents is received from the on-ground tech team over mail. The same are downloaded by our internal backend team and saved in Repository. The repository consists of scheme wise folders. These scheme wise folders have job role specific folders. These specific folders have Year wise and Month wise folders where all documents are saved in Batch specific folders. All Hard copies are filed and stored in storeroom.
- **Result Review and Recheck Mechanism –**
  - Time stamped assessment logs
  - Answer/Endorsement sheets for each candidate
  - Attendance Sheet
  - Feedback Forms: Assessor feedback form, Candidate feedback form, TP feedback form
  - The results for each of the candidate shall be stored and available for review (retained for 5 years/ till conclusion of project or scheme)