



# Plant Tissue Culture Technician

QP Code: AGR/Q8101

Version: 4.0

NSQF Level: 4

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## AGR/Q8101: Plant Tissue Culture Technician

### Brief Job Description

A Plant Tissue culture Technician performs several activities such as preparing the lab, culture media and mother plant, extracting, preparing, planting and maintaining explants. The person also transplants the tissue cultured plants and maintains record of laboratory operations.

### Personal Attributes

The individual in this role must have good eyesight and hand-eye coordination. The person must have problem-solving skills and the ability to learn, multi-task, and follow instructions.

### Applicable National Occupational Standards (NOS)

#### Compulsory NOS:

1. [AGR/N8102: Prepare for plant tissue culture](#)
2. [AGR/N8103: Carry out plant tissue culture](#)
3. [AGR/N8115: Transplant the tissue cultured plants and maintain records](#)
4. [AGR/N9903: Maintain health and safety at the workplace](#)
5. [DGT/VSQ/N0102: Employability Skills \(60 Hours\)](#)

### Qualification Pack (QP) Parameters

<b>Sector</b>	Agriculture
<b>Sub-Sector</b>	Agriculture Industries
<b>Occupation</b>	Research & Development
<b>Country</b>	India
<b>NSQF Level</b>	4
<b>Credits</b>	13
<b>Aligned to NCO/ISCO/ISIC Code</b>	NCO-2015/3142.9900

<b>Minimum Educational Qualification &amp; Experience</b>	12th Class (pass or equivalent (in Science)) OR 10th grade pass with 3 Years of experience relevant experience in Agriculture and allied sectors OR Previous relevant Qualification of NSQF Level (3.5) with 1.5 years of experience relevant experience in Agriculture and allied sectors OR Previous relevant Qualification of NSQF Level (3) with 3 Years of experience relevant experience in Agriculture and allied sectors
<b>Minimum Level of Education for Training in School</b>	10th Class
<b>Pre-Requisite License or Training</b>	NA
<b>Minimum Job Entry Age</b>	18 Years
<b>Last Reviewed On</b>	NA
<b>Next Review Date</b>	NA
<b>NSQC Approval Date</b>	
<b>Version</b>	4.0

## **AGR/N8102: Prepare for plant tissue culture**

### **Description**

This OS unit is about preparing the lab, lab equipment and an appropriate culture medium for carrying out plant tissue culture.

### **Scope**

The scope covers the following :

- Prepare for lab experiments
- Calibrate and maintain the lab equipment
- Maintain the lab inventory
- Prepare the plant tissue culture medium
- Sterilise and store the culture medium

### **Elements and Performance Criteria**

#### *Prepare for lab experiments*

To be competent, the user/individual on the job must be able to:

- PC1.** arrange the necessary lab equipment, personal protective equipment (PPE)
- PC2.** set up laboratory with the required instructional materials and supplies for the research project
- PC3.** examine the PPE and clothing for any wear and tear or damage
- PC4.** apply disinfectant on the relevant lab areas to remove all bacteria/ micro-organisms
- PC5.** ensure the room for incubating cultures has the relevant equipment to control temperature, light and humidity
- PC6.** test the computer system for correct functioning to record the relevant data
- PC7.** ensure the availability of washing area, workbenches and safe storage of lab equipment
- PC8.** dispose any expired chemicals as per the Standard Operating Procedure (SOP)
- PC9.** remove all consumables and flammable items from the lab

#### *Calibrate and maintain the lab equipment*

To be competent, the user/individual on the job must be able to:

- PC10.** identify the relevant lab equipment to be used in the plant tissue culture activities
- PC11.** follow the laboratory procedures while handling lab tools, equipment, dead weights, calibrated measuring jars and reagents
- PC12.** calibrate equipment in accordance with the tolerances prescribed by the manufacturer
- PC13.** apply label on the lab equipment to identify the calibrated equipment
- PC14.** co-ordinate with the manufacturer for the calibration of equipment requiring expert assistance
- PC15.** check the working and performance of all equipment on a regular basis
- PC16.** report any malfunctions/ repair needs to the supervisor
- PC17.** co-ordinate with the maintenance service provider to ensure maintenance of all lab equipment

**PC18.** maintain the relevant lab-equipment records such as their performance, faults, repair, annual maintenance, etc.

*Maintain the lab inventory*

To be competent, the user/individual on the job must be able to:

**PC19.** maintain the inventory of lab supplies by checking the stock regularly

**PC20.** order the lab supplies when required

**PC21.** verify the receipt of lab supplies

**PC22.** maintain stock buffer of reagents and microbiological media

*Prepare the plant tissue culture medium*

To be competent, the user/individual on the job must be able to:

**PC23.** identify the appropriate culture medium along with its nature, composition and suitability for the selected explants

**PC24.** use the recommended grade of lab chemicals and agar for the preparation of culture medium

**PC25.** use double glass distilled, Reverse Osmosis (RO) or demineralised water in culture medium

**PC26.** prepare different stock solutions as nutrient medium with the required constituents, strength and volume

**PC27.** ensure the availability of deep freezer to store stock solutions; refrigerator to store chemicals, short-term storage for stock solutions; storage tank for distilled water and other equipment such as electronic weighing balance, hot plates, Potential of Hydrogen (pH) meter, etc.

**PC28.** store or refrigerate the stock solutions at the recommended temperature after applying appropriate labels on them

**PC29.** prepare culture medium such as MS, B5, N6, Nitsch and Whites using the recommended quantity of sucrose, agar, water and stock solution with the help of hot plate and magnetic stirrer

**PC30.** adjust the pH of the culture medium to the required level using HCl and NaOH (hydrochloric acid and sodium hydroxide) solution

**PC31.** dispense medium uniformly into culture bottles/ tubes manually or with the help of automatic media dispenser

**PC32.** apply label with the relevant information on the culture bottles/ tubes

**PC33.** maintain the record of prepared culture medium in the media register or relevant computer system

*Sterilise and store the culture medium*

To be competent, the user/individual on the job must be able to:

**PC34.** sterilise the media at the prescribed temperature and pressure for an appropriate duration in an autoclave

**PC35.** sterilise the syntax filters before use

**PC36.** carry out filtration sterilisation of the stock solutions through a syntax filter

**PC37.** dispense the filter sterilised solution in the autoclaved media after cooling under aseptic conditions

**PC38.** transfer the culture bottles to media storage room immediately after autoclaving

**PC39.** check the culture medium for microbial contamination after autoclaving and discard the entire lot along with the culture bottles in case contamination is found to be above the prescribed limit

## **Knowledge and Understanding (KU)**

The individual on the job needs to know and understand:

- KU1.** layout of a plant tissue culture lab
- KU2.** importance and the process of plant tissue culture
- KU3.** various lab equipment required for plant tissue culture
- KU4.** different methods of sterilising the lab equipment
- KU5.** relevant adjustments required in lab equipment before use
- KU6.** maintenance schedule for various lab equipment
- KU7.** safe use of recommended disinfectants in a lab environment
- KU8.** the use of culture medium in plant tissue culture and various ingredients used in preparing it
- KU9.** the process of preparing culture medium
- KU10.** various ingredients used in the medium such as macronutrients, micronutrients, vitamins, amino acids, sugar, sucrose, organic supplements, solidifying agents, etc.
- KU11.** different types of media such as whites, Murshaige and Skoog (MS), Linsmaeir and Skoog (MS), Gamborg (B5), Nitsch and Nitsch (NN), etc.
- KU12.** sterilization and storage of the medium
- KU13.** different types of plant growth regulators and their correct use
- KU14.** the SOP for various lab equipment and their maintenance
- KU15.** safe use of an autoclave
- KU16.** safe storage of plant tissue culture medium
- KU17.** method of adjusting the plant tissue culture medium's Potential of Hydrogen (pH)

## **Generic Skills (GS)**

User/individual on the job needs to know how to:

- GS1.** write work-related notes
- GS2.** read the relevant guides and manuals
- GS3.** communicate clearly and politely
- GS4.** listen attentively to understand the information/ instructions being given
- GS5.** plan and prioritise tasks to ensure timely completion
- GS6.** take quick decisions to deal with workplace emergencies/ accidents
- GS7.** identify possible disruptions to work and take preventive measures
- GS8.** co-ordinate with co-workers to achieve the work objectives

**Assessment Criteria**

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Prepare for lab experiments</i>	<b>4</b>	<b>8</b>	-	<b>10</b>
<b>PC1.</b> arrange the necessary lab equipment, personal protective equipment (PPE)	-	-	-	-
<b>PC2.</b> set up laboratory with the required instructional materials and supplies for the research project	-	-	-	-
<b>PC3.</b> examine the PPE and clothing for any wear and tear or damage	-	-	-	-
<b>PC4.</b> apply disinfectant on the relevant lab areas to remove all bacteria/ micro-organisms	-	-	-	-
<b>PC5.</b> ensure the room for incubating cultures has the relevant equipment to control temperature, light and humidity	-	-	-	-
<b>PC6.</b> test the computer system for correct functioning to record the relevant data	-	-	-	-
<b>PC7.</b> ensure the availability of washing area, workbenches and safe storage of lab equipment	-	-	-	-
<b>PC8.</b> dispose any expired chemicals as per the Standard Operating Procedure (SOP)	-	-	-	-
<b>PC9.</b> remove all consumables and flammable items from the lab	-	-	-	-
<i>Calibrate and maintain the lab equipment</i>	<b>4</b>	<b>8</b>	-	<b>4</b>
<b>PC10.</b> identify the relevant lab equipment to be used in the plant tissue culture activities	-	-	-	-
<b>PC11.</b> follow the laboratory procedures while handling lab tools, equipment, dead weights, calibrated measuring jars and reagents	-	-	-	-
<b>PC12.</b> calibrate equipment in accordance with the tolerances prescribed by the manufacturer	-	-	-	-
<b>PC13.</b> apply label on the lab equipment to identify the calibrated equipment	-	-	-	-



<b>Assessment Criteria for Outcomes</b>	<b>Theory Marks</b>	<b>Practical Marks</b>	<b>Project Marks</b>	<b>Viva Marks</b>
<b>PC14.</b> co-ordinate with the manufacturer for the calibration of equipment requiring expert assistance	-	-	-	-
<b>PC15.</b> check the working and performance of all equipment on a regular basis	-	-	-	-
<b>PC16.</b> report any malfunctions/ repair needs to the supervisor	-	-	-	-
<b>PC17.</b> co-ordinate with the maintenance service provider to ensure maintenance of all lab equipment	-	-	-	-
<b>PC18.</b> maintain the relevant lab-equipment records such as their performance, faults, repair, annual maintenance, etc.	-	-	-	-
<i>Maintain the lab inventory</i>	<b>6</b>	<b>8</b>	-	<b>4</b>
<b>PC19.</b> maintain the inventory of lab supplies by checking the stock regularly	-	-	-	-
<b>PC20.</b> order the lab supplies when required	-	-	-	-
<b>PC21.</b> verify the receipt of lab supplies	-	-	-	-
<b>PC22.</b> maintain stock buffer of reagents and microbiological media	-	-	-	-
<i>Prepare the plant tissue culture medium</i>	<b>6</b>	<b>8</b>	-	<b>6</b>
<b>PC23.</b> identify the appropriate culture medium along with its nature, composition and suitability for the selected explants	-	-	-	-
<b>PC24.</b> use the recommended grade of lab chemicals and agar for the preparation of culture medium	-	-	-	-
<b>PC25.</b> use double glass distilled, Reverse Osmosis (RO) or demineralised water in culture medium	-	-	-	-
<b>PC26.</b> prepare different stock solutions as nutrient medium with the required constituents, strength and volume	-	-	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<b>PC27.</b> ensure the availability of deep freezer to store stock solutions; refrigerator to store chemicals, short-term storage for stock solutions; storage tank for distilled water and other equipment such as electronic weighing balance, hot plates, Potential of Hydrogen (pH) meter, etc.	-	-	-	-
<b>PC28.</b> store or refrigerate the stock solutions at the recommended temperature after applying appropriate labels on them	-	-	-	-
<b>PC29.</b> prepare culture medium such as MS, B5, N6, Nitsch and Whites using the recommended quantity of sucrose, agar, water and stock solution with the help of hot plate and magnetic stirrer	-	-	-	-
<b>PC30.</b> adjust the pH of the culture medium to the required level using HCl and NaOH (hydrochloric acid and sodium hydroxide) solution	-	-	-	-
<b>PC31.</b> dispense medium uniformly into culture bottles/ tubes manually or with the help of automatic media dispenser	-	-	-	-
<b>PC32.</b> apply label with the relevant information on the culture bottles/ tubes	-	-	-	-
<b>PC33.</b> maintain the record of prepared culture medium in the media register or relevant computer system	-	-	-	-
<i>Sterilise and store the culture medium</i>	<b>10</b>	<b>8</b>	-	<b>6</b>
<b>PC34.</b> sterilise the media at the prescribed temperature and pressure for an appropriate duration in an autoclave	-	-	-	-
<b>PC35.</b> sterilise the syntax filters before use	-	-	-	-
<b>PC36.</b> carry out filtration sterilisation of the stock solutions through a syntax filter	-	-	-	-
<b>PC37.</b> dispense the filter sterilised solution in the autoclaved media after cooling under aseptic conditions	-	-	-	-
<b>PC38.</b> transfer the culture bottles to media storage room immediately after autoclaving	-	-	-	-

<b>Assessment Criteria for Outcomes</b>	<b>Theory Marks</b>	<b>Practical Marks</b>	<b>Project Marks</b>	<b>Viva Marks</b>
<b>PC39.</b> check the culture medium for microbial contamination after autoclaving and discard the entire lot along with the culture bottles in case contamination is found to be above the prescribed limit	-	-	-	-
<b>NOS Total</b>	<b>30</b>	<b>40</b>	-	<b>30</b>

**National Occupational Standards (NOS) Parameters**

<b>NOS Code</b>	AGR/N8102
<b>NOS Name</b>	Prepare for plant tissue culture
<b>Sector</b>	Agriculture
<b>Sub-Sector</b>	Agriculture Industries
<b>Occupation</b>	Research & Development
<b>NSQF Level</b>	4
<b>Credits</b>	2
<b>Version</b>	2.0
<b>Last Reviewed Date</b>	NA
<b>Next Review Date</b>	27/05/2024
<b>NSQC Clearance Date</b>	27/05/2021

## **AGR/N8103: Carry out plant tissue culture**

### **Description**

This OS unit is about carrying out various activities in the process of propagating plants through plant tissue culture.

### **Scope**

The scope covers the following :

- Prepare the mother plant and explant
- Prepare for transferring the explant to culture medium
- Transfer the explant to culture medium
- Acclimatise the tissue cultured plants

### **Elements and Performance Criteria**

#### *Prepare the mother plant and explant*

To be competent, the user/individual on the job must be able to:

- PC1.** identify the crops and plants that can undergo micro-propagation such as fruits, vegetables, food grain crops, ornamental plants, etc.
- PC2.** select the mother plant which appear healthy and are free from pests, diseases and bacterial infections
- PC3.** ensure that the mother plants are grown in a greenhouse wherever possible
- PC4.** expose the mother plants to recommended temperature and sunlight to improve the quality of explants
- PC5.** pre-treat the mother plant with recommended fungicides where possible to prevent bacterial contamination
- PC6.** water the plants with the recommended quantity of filtered water
- PC7.** apply a label on the mother plant container with the relevant details such as the name and type of the plant, the location and date of extraction, etc.
- PC8.** pack the mother plant appropriately in cardboard cartons or immersed water
- PC9.** transport the mother plant to the culture laboratory safely under the recommended temperature
- PC10.** maintain the plant in a sterilised environment prior to use
- PC11.** use the relevant tools to extract the explant from the sterilised mother plant
- PC12.** sterilise the explant using the prescribed sterilisation solution

#### *Prepare for transferring the explant to culture medium*

To be competent, the user/individual on the job must be able to:

- PC13.** cut the explant into pieces of the prescribed length
- PC14.** wash the plant pieces using the recommended cleaning agent
- PC15.** transfer the plant parts into containers with Clorox solution and soak them for the recommended duration
- PC16.** discard the Clorox solution as per the SOP

**PC17.** maintain the plant parts in the container under the recommended temperature

*Transfer the explant to culture medium*

To be competent, the user/individual on the job must be able to:

**PC18.** sterilise the relevant equipment and containers using an alcohol-based disinfectant

**PC19.** pour sterile water into the container with the plant parts

**PC20.** shake the container gently after placing a sterile lid to wash the tissue and remove the sterilising solution

**PC21.** place the plant parts using sterilised gloves on a sterile petri dish after removing from the container

**PC22.** cut the plant parts into smaller pieces of the recommended length using a sterilised blade

**PC23.** discard the damaged plant parts safely

**PC24.** place the plant pieces into the culture bottles/ tubes containing culture medium using sterile forceps

**PC25.** place cap on the culture bottles/ tubes tightly

**PC26.** store the culture bottles/ tubes in trays or storage racks safely

**PC27.** maintain the appropriate conditions in the lab such as temperature, humidity and illumination for the multiplication of plant tissues

**PC28.** add cytokinin to the culture medium as per the requirement to regulate the growth of plant shoots

**PC29.** monitor the plant shoots regularly for the correct growth and any contaminations

**PC30.** discard the contaminated plant shoots as per the SOP

**PC31.** transfer the proliferated shoots to fresh culture medium for mass multiplication

**PC32.** place the shoots in another nutrient culture medium specific for root development

**PC33.** add auxins in the recommended quantity to promote root formation

**PC34.** monitor the development of roots

**PC35.** apply the necessary treatment to resolve any issues with root development

**PC36.** maintain the record of observations in the register or the relevant computer system

*Acclimatise the tissue cultured plants*

To be competent, the user/individual on the job must be able to:

**PC37.** select a facility with the appropriate temperature and humidity favourable for the plants

**PC38.** remove the plantlets from culture bottles/ tubes after they achieve adequate growth and rooting

**PC39.** wash the plantlets gently to remove any traces of culture media

**PC40.** plant the tissue cultured plants in micro-pots filled with soil/ soilrite/ sand for primary hardening

**PC41.** label the plants with the necessary information

**PC42.** apply water and fertilizers in the recommended quantity as per the schedule

**PC43.** maintain the plants in the facility for the recommended duration before hardening off

*Harden off the plants*

To be competent, the user/individual on the job must be able to:

**PC44.** place the plants in a greenhouse or shade net facility with controlled micro-climatic conditions such as relative humidity, temperature, light intensity and air circulation

- PC45.** transfer the plants to larger pots for secondary hardening after they develop new leaves and roots
- PC46.** maintain the level of nutrients for the optimum growth of plants
- PC47.** conduct routine checks on the plantlets to ensure their healthy growth and detect presence of any infections
- PC48.** remove the dead and decaying plants
- PC49.** maintain the plants in the environment for the recommended period before transplanting

### **Knowledge and Understanding (KU)**

The individual on the job needs to know and understand:

- KU1.** different types of crops, fruits and vegetables suitable for plant propagation
- KU2.** criteria for selecting a mother plant
- KU3.** the process of preparing the mother plant to extract explants
- KU4.** various techniques in plant tissue culture and their applications
- KU5.** best practices to maintain hygiene in a lab and prevent contamination of plants
- KU6.** required characteristics of a plant used to extract the explant
- KU7.** process of sterilising an explant
- KU8.** the importance of using sterilised tools and equipment in plant tissue culture
- KU9.** safe method of transporting an explant
- KU10.** relevant labelling requirements
- KU11.** the process of preparing and transferring an explant to the medium
- KU12.** use of relevant plant growth regulators to enhance the effectiveness of a medium
- KU13.** use of different types of sanitisers
- KU14.** relevant temperature, humidity and illumination requirements for the multiplication of plant tissues in a lab environment
- KU15.** the transfer of plant shoots from one medium to the other
- KU16.** use and safe handling of culture bottles/ tubes
- KU17.** importance and the process of acclimatising the plants
- KU18.** relevant precautions to be taken while acclimatising plants
- KU19.** appropriate plant growth conditions and micro-climate maintenance
- KU20.** physical screening of contaminants
- KU21.** operation and maintenance of various lab equipment
- KU22.** the importance of maintaining a controlled growth environment in the lab
- KU23.** safe handling of hazardous chemicals

### **Generic Skills (GS)**

User/individual on the job needs to know how to:

- GS1.** write work-related notes and maintain records
- GS2.** communicate clearly and politely with co-workers and clients

- GS3.** read the relevant literature to get information about the latest developments in the field of work
- GS4.** plan and prioritise tasks to ensure timely completion
- GS5.** take quick decisions to deal with workplace emergencies/ accidents
- GS6.** listen attentively to understand the information/ instructions being shared by the speaker
- GS7.** identify possible disruptions to work and take appropriate preventive measures
- GS8.** co-ordinate with co-workers to achieve work objectives
- GS9.** evaluate all possible solutions to a problem to select the best one



**Assessment Criteria**

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Prepare the mother plant and explant</i>	<b>6</b>	<b>8</b>	-	<b>10</b>
<b>PC1.</b> identify the crops and plants that can undergo micro-propagation such as fruits, vegetables, food grain crops, ornamental plants, etc.	-	-	-	-
<b>PC2.</b> select the mother plant which appear healthy and are free from pests, diseases and bacterial infections	-	-	-	-
<b>PC3.</b> ensure that the mother plants are grown in a greenhouse wherever possible	-	-	-	-
<b>PC4.</b> expose the mother plants to recommended temperature and sunlight to improve the quality of explants	-	-	-	-
<b>PC5.</b> pre-treat the mother plant with recommended fungicides where possible to prevent bacterial contamination	-	-	-	-
<b>PC6.</b> water the plants with the recommended quantity of filtered water	-	-	-	-
<b>PC7.</b> apply a label on the mother plant container with the relevant details such as the name and type of the plant, the location and date of extraction, etc.	-	-	-	-
<b>PC8.</b> pack the mother plant appropriately in cardboard cartons or immersed water	-	-	-	-
<b>PC9.</b> transport the mother plant to the culture laboratory safely under the recommended temperature	-	-	-	-
<b>PC10.</b> maintain the plant in a sterilised environment prior to use	-	-	-	-
<b>PC11.</b> use the relevant tools to extract the explant from the sterilised mother plant	-	-	-	-
<b>PC12.</b> sterilise the explant using the prescribed sterilisation solution	-	-	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Prepare for transferring the explant to culture medium</i>	<b>4</b>	<b>8</b>	-	<b>10</b>
<b>PC13.</b> cut the explant into pieces of the prescribed length	-	-	-	-
<b>PC14.</b> wash the plant pieces using the recommended cleaning agent	-	-	-	-
<b>PC15.</b> transfer the plant parts into containers with Clorox solution and soak them for the recommended duration	-	-	-	-
<b>PC16.</b> discard the Clorox solution as per the SOP	-	-	-	-
<b>PC17.</b> maintain the plant parts in the container under the recommended temperature	-	-	-	-
<i>Transfer the explant to culture medium</i>	<b>8</b>	<b>4</b>	-	<b>2</b>
<b>PC18.</b> sterilise the relevant equipment and containers using an alcohol-based disinfectant	-	-	-	-
<b>PC19.</b> pour sterile water into the container with the plant parts	-	-	-	-
<b>PC20.</b> shake the container gently after placing a sterile lid to wash the tissue and remove the sterilising solution	-	-	-	-
<b>PC21.</b> place the plant parts using sterilised gloves on a sterile petri dish after removing from the container	-	-	-	-
<b>PC22.</b> cut the plant parts into smaller pieces of the recommended length using a sterilised blade	-	-	-	-
<b>PC23.</b> discard the damaged plant parts safely	-	-	-	-
<b>PC24.</b> place the plant pieces into the culture bottles/ tubes containing culture medium using sterile forceps	-	-	-	-
<b>PC25.</b> place cap on the culture bottles/ tubes tightly	-	-	-	-
<b>PC26.</b> store the culture bottles/ tubes in trays or storage racks safely	-	-	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<b>PC27.</b> maintain the appropriate conditions in the lab such as temperature, humidity and illumination for the multiplication of plant tissues	-	-	-	-
<b>PC28.</b> add cytokinin to the culture medium as per the requirement to regulate the growth of plant shoots	-	-	-	-
<b>PC29.</b> monitor the plant shoots regularly for the correct growth and any contaminations	-	-	-	-
<b>PC30.</b> discard the contaminated plant shoots as per the SOP	-	-	-	-
<b>PC31.</b> transfer the proliferated shoots to fresh culture medium for mass multiplication	-	-	-	-
<b>PC32.</b> place the shoots in another nutrient culture medium specific for root development	-	-	-	-
<b>PC33.</b> add auxins in the recommended quantity to promote root formation	-	-	-	-
<b>PC34.</b> monitor the development of roots	-	-	-	-
<b>PC35.</b> apply the necessary treatment to resolve any issues with root development	-	-	-	-
<b>PC36.</b> maintain the record of observations in the register or the relevant computer system	-	-	-	-
<i>Acclimatise the tissue cultured plants</i>	<b>4</b>	<b>10</b>	-	<b>4</b>
<b>PC37.</b> select a facility with the appropriate temperature and humidity favourable for the plants	-	-	-	-
<b>PC38.</b> remove the plantlets from culture bottles/ tubes after they achieve adequate growth and rooting	-	-	-	-
<b>PC39.</b> wash the plantlets gently to remove any traces of culture media	-	-	-	-
<b>PC40.</b> plant the tissue cultured plants in micro-pots filled with soil/ soilrite/ sand for primary hardening	-	-	-	-
<b>PC41.</b> label the plants with the necessary information	-	-	-	-

<b>Assessment Criteria for Outcomes</b>	<b>Theory Marks</b>	<b>Practical Marks</b>	<b>Project Marks</b>	<b>Viva Marks</b>
<b>PC42.</b> apply water and fertilizers in the recommended quantity as per the schedule	-	-	-	-
<b>PC43.</b> maintain the plants in the facility for the recommended duration before hardening off	-	-	-	-
<i>Harden off the plants</i>	<b>8</b>	<b>10</b>	-	<b>4</b>
<b>PC44.</b> place the plants in a greenhouse or shade net facility with controlled micro-climatic conditions such as relative humidity, temperature, light intensity and air circulation	-	-	-	-
<b>PC45.</b> transfer the plants to larger pots for secondary hardening after they develop new leaves and roots	-	-	-	-
<b>PC46.</b> maintain the level of nutrients for the optimum growth of plants	-	-	-	-
<b>PC47.</b> conduct routine checks on the plantlets to ensure their healthy growth and detect presence of any infections	-	-	-	-
<b>PC48.</b> remove the dead and decaying plants	-	-	-	-
<b>PC49.</b> maintain the plants in the environment for the recommended period before transplanting	-	-	-	-
<b>NOS Total</b>	<b>30</b>	<b>40</b>	-	<b>30</b>

**National Occupational Standards (NOS) Parameters**

<b>NOS Code</b>	AGR/N8103
<b>NOS Name</b>	Carry out plant tissue culture
<b>Sector</b>	Agriculture
<b>Sub-Sector</b>	Agriculture Industries
<b>Occupation</b>	Research & Development
<b>NSQF Level</b>	4
<b>Credits</b>	2
<b>Version</b>	2.0
<b>Last Reviewed Date</b>	NA
<b>Next Review Date</b>	27/05/2024
<b>NSQC Clearance Date</b>	27/05/2021

## **AGR/N8115: Transplant the tissue cultured plants and maintain records**

### **Description**

This OS unit is about transplanting the tissue cultured plants and maintaining the record of lab operations.

### **Scope**

The scope covers the following :

- Transplant the plants
- Maintain the record of lab operations
- Optimise resource utilisation
- Perform waste management

### **Elements and Performance Criteria**

#### *Transplant the plants*

To be competent, the user/individual on the job must be able to:

- PC1.** select a spot with adequate exposure to sunlight
- PC2.** prepare the planting bed in a greenhouse or select larger pots of appropriate size for transplanting the plants
- PC3.** create holes of the recommended width and depth to place the plants
- PC4.** water the potted plants to loosen the soil around their roots
- PC5.** extract the plants from the pots ensuring no damage to plants and their roots
- PC6.** place the plants in the holes and cover the roots with the soil
- PC7.** apply the recommended amount of fertilizers and water
- PC8.** arrange to protect the transplanted plants from excessive heat and cold
- PC9.** maintain the plants in the recommended temperature and humidity
- PC10.** apply necessary treatment if the transplanted plants show signs of wilting, pests and disease

#### *Maintain the record of lab operations*

To be competent, the user/individual on the job must be able to:

- PC11.** use the appropriate computer application to maintain the record of lab operations in the prescribed format
- PC12.** review the data regularly to ensure accuracy
- PC13.** comply with the applicable regulatory record keeping requirements

#### *Optimise resource utilisation*

To be competent, the user/individual on the job must be able to:

- PC14.** optimise the usage of various material in different tasks/ activities/ processes
- PC15.** optimise the usage of electricity/ water/ energy in various tasks/ activities/ processes
- PC16.** connect the electrical tools and equipment safely and turn off when not in use

#### *Perform waste management*

To be competent, the user/individual on the job must be able to:

- PC17.** segregate waste into different categories

**PC18.** dispose the non-recyclable waste appropriately

**PC19.** deposit the recyclable and reusable material at the identified location

### **Knowledge and Understanding (KU)**

The individual on the job needs to know and understand:

- KU1.** the process of transplanting the tissue cultured plants
- KU2.** preparation of a planting bed to transplant plants
- KU3.** various material required for transplanting tissue cultured plants
- KU4.** the temperature and humidity required for acclimatising plants in a greenhouse/ open environment
- KU5.** water and macro/ micro-nutrient requirements of tissue cultured plants
- KU6.** appropriate conditions for transplanting the acclimatised and established plants to larger pots or greenhouse conditions
- KU7.** importance of following environmental and ecological best practices to minimise the impact on the environment
- KU8.** benefits of resource optimisation
- KU9.** ways of efficiently managing various materials used in different operations
- KU10.** common practices of conserving electricity
- KU11.** different methods of recycling and disposing waste
- KU12.** common sources of pollution and ways to minimise it

### **Generic Skills (GS)**

User/individual on the job needs to know how to:

- GS1.** write work-related notes
- GS2.** communicate politely and professionally
- GS3.** read the relevant literature to learn about the latest developments in the field of work
- GS4.** listen attentively to understand the information/ instructions being shared by the speaker
- GS5.** plan and prioritise tasks to ensure timely completion
- GS6.** co-ordinate with co-workers to achieve work objectives
- GS7.** evaluate all possible solutions to a problem to select the best one
- GS8.** identify possible disruptions to work and take appropriate preventive measures
- GS9.** take quick decisions to deal with workplace emergencies/ accidents

**Assessment Criteria**

<b>Assessment Criteria for Outcomes</b>	<b>Theory Marks</b>	<b>Practical Marks</b>	<b>Project Marks</b>	<b>Viva Marks</b>
<i>Transplant the plants</i>	<b>10</b>	<b>8</b>	-	<b>10</b>
<b>PC1.</b> select a spot with adequate exposure to sunlight	-	-	-	-
<b>PC2.</b> prepare the planting bed in a greenhouse or select larger pots of appropriate size for transplanting the plants	-	-	-	-
<b>PC3.</b> create holes of the recommended width and depth to place the plants	-	-	-	-
<b>PC4.</b> water the potted plants to loosen the soil around their roots	-	-	-	-
<b>PC5.</b> extract the plants from the pots ensuring no damage to plants and their roots	-	-	-	-
<b>PC6.</b> place the plants in the holes and cover the roots with the soil	-	-	-	-
<b>PC7.</b> apply the recommended amount of fertilizers and water	-	-	-	-
<b>PC8.</b> arrange to protect the transplanted plants from excessive heat and cold	-	-	-	-
<b>PC9.</b> maintain the plants in the recommended temperature and humidity	-	-	-	-
<b>PC10.</b> apply necessary treatment if the transplanted plants show signs of wilting, pests and disease	-	-	-	-
<i>Maintain the record of lab operations</i>	<b>6</b>	<b>8</b>	-	<b>4</b>
<b>PC11.</b> use the appropriate computer application to maintain the record of lab operations in the prescribed format	-	-	-	-
<b>PC12.</b> review the data regularly to ensure accuracy	-	-	-	-
<b>PC13.</b> comply with the applicable regulatory record keeping requirements	-	-	-	-
<i>Optimise resource utilisation</i>	<b>8</b>	<b>12</b>	-	<b>8</b>



<b>Assessment Criteria for Outcomes</b>	<b>Theory Marks</b>	<b>Practical Marks</b>	<b>Project Marks</b>	<b>Viva Marks</b>
<b>PC14.</b> optimise the usage of various material in different tasks/ activities/ processes	-	-	-	-
<b>PC15.</b> optimise the usage of electricity/ water/ energy in various tasks/ activities/ processes	-	-	-	-
<b>PC16.</b> connect the electrical tools and equipment safely and turn off when not in use	-	-	-	-
<i>Perform waste management</i>	<b>6</b>	<b>12</b>	-	<b>8</b>
<b>PC17.</b> segregate waste into different categories	-	-	-	-
<b>PC18.</b> dispose the non-recyclable waste appropriately	-	-	-	-
<b>PC19.</b> deposit the recyclable and reusable material at the identified location	-	-	-	-
<b>NOS Total</b>	<b>30</b>	<b>40</b>	-	<b>30</b>

**National Occupational Standards (NOS) Parameters**

<b>NOS Code</b>	AGR/N8115
<b>NOS Name</b>	Transplant the tissue cultured plants and maintain records
<b>Sector</b>	Agriculture
<b>Sub-Sector</b>	Agriculture Industries
<b>Occupation</b>	Research and Development
<b>NSQF Level</b>	4
<b>Credits</b>	2
<b>Version</b>	1.0
<b>Last Reviewed Date</b>	NA
<b>Next Review Date</b>	27/05/2024
<b>NSQC Clearance Date</b>	27/05/2021

## **AGR/N9903: Maintain health and safety at the workplace**

### **Description**

This OS is about maintaining health and safety of self and other co-workers at the workplace

### **Scope**

The scope covers the following :

- Maintain personal hygiene
- Maintain clean and safe workplace
- Administer appropriate emergency procedures

### **Elements and Performance Criteria**

#### *Maintain personal hygiene*

To be competent, the user/individual on the job must be able to:

- PC1.** wash hands, legs and face with soap/alcohol based sanitizer at reasonable intervals
- PC2.** wash the worn clothes with soap and sun dry before use next time
- PC3.** ensure the face is covered with mask or three layers of cloth-piece
- PC4.** follow the workplace sanitization norms including distancing from sick people

#### *Maintain clean and safe workplace*

To be competent, the user/individual on the job must be able to:

- PC5.** carry out basic safety checks before operation of all tools, implements, and machinery and report identified hazards to the supervisor
- PC6.** wear appropriate Personal Protective Equipment (PPE) while performing work in accordance with the workplace policy
- PC7.** follow the instructions mentioned on the labels of chemicals/pesticides/fumigants etc to avoid hazards
- PC8.** assess risks prior to performing manual handling jobs, and work according to currently recommended safe practices
- PC9.** sanitize equipment, tools and machinery before and after use
- PC10.** use equipment and materials safely and correctly and return the same to designated storage after use
- PC11.** dispose waste safely and correctly in the designated area
- PC12.** recognize risks to bystanders and take required action to reduce the risks
- PC13.** work in a manner which minimizes environmental damage, ensuring all procedures and instructions for controlling risks are followed
- PC14.** report any accidents, incidents or problems without delay to an appropriate person and take necessary immediate action to reduce further danger
- PC15.** follow government / workplace advisories incase of outbreak of any disease/disaster

#### *Administer appropriate emergency procedures*

To be competent, the user/individual on the job must be able to:

- PC16.** follow procedures for dealing with accidents, fires and emergencies, including communicating location and directions to the location of emergency, as per the workplace requirements
- PC17.** use emergency equipment in accordance with manufacturer's specifications and workplace requirements
- PC18.** provide treatment appropriate to the patient's injuries in accordance with recognized first aid techniques
- PC19.** recover (if practical), clean, inspect/test, refurbish, replace and store the first aid equipment as appropriate
- PC20.** report details of first aid administered in accordance with workplace procedures

### **Knowledge and Understanding (KU)**

The individual on the job needs to know and understand:

- KU1.** relevant legislation, standards, policies, and procedures at work
- KU2.** relevant health and safety requirements applicable to the work environment
- KU3.** own job role and responsibilities and sources of information pertaining to work
- KU4.** who to approach for support in order to obtain work related information, clarifications and support
- KU5.** importance of following health, hygiene, safety and quality standards and the impact of not following the standards on consumers and the business
- KU6.** personal hygiene and fitness requirement
- KU7.** importance of sanitization of the workplace
- KU8.** types of Personal Protective Equipment (PPE) required at the workplace and their importance
- KU9.** the correct and safe way to use materials and equipment required for the work
- KU10.** the importance of good housekeeping at the workplace
- KU11.** safe waste disposal methods
- KU12.** methods for minimizing environmental damage during work
- KU13.** the risks to health and safety including contagious diseases and the measures to be taken to control those risks in the area of work
- KU14.** workplace procedures and requirements for the prevention and treatment of workplace injuries/illnesses.
- KU15.** basic emergency first aid procedure
- KU16.** local emergency services
- KU17.** why accidents, incidents and problems should be reported and the appropriate actions to be taken

### **Generic Skills (GS)**

User/individual on the job needs to know how to:

- GS1.** record the data as per the requirement
- GS2.** report problems to the appropriate personnel in a timely manner
- GS3.** read instruction manual for hand tool and equipments

- GS4.** communicate clearly and effectively with co-workers, and other stakeholders
- GS5.** comprehend information shared by senior people and experts
- GS6.** make decisions pertaining to personal hygiene and safety
- GS7.** schedule daily activities and draw up priorities
- GS8.** manage relationships with co-workers, manager and other stakeholders
- GS9.** assess situation and identify appropriate control measures

**Assessment Criteria**

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Maintain personal hygiene</i>	<b>10</b>	<b>5</b>	-	<b>10</b>
<b>PC1.</b> wash hands, legs and face with soap/alcohol based sanitizer at reasonable intervals	-	-	-	-
<b>PC2.</b> wash the worn clothes with soap and sun dry before use next time	-	-	-	-
<b>PC3.</b> ensure the face is covered with mask or three layers of cloth-piece	-	-	-	-
<b>PC4.</b> follow the workplace sanitization norms including distancing from sick people	-	-	-	-
<i>Maintain clean and safe workplace</i>	<b>15</b>	<b>15</b>	-	<b>15</b>
<b>PC5.</b> carry out basic safety checks before operation of all tools, implements, and machinery and report identified hazards to the supervisor	-	-	-	-
<b>PC6.</b> wear appropriate Personal Protective Equipment (PPE) while performing work in accordance with the workplace policy	-	-	-	-
<b>PC7.</b> follow the instructions mentioned on the labels of chemicals/pesticides/fumigants etc to avoid hazards	-	-	-	-
<b>PC8.</b> assess risks prior to performing manual handling jobs, and work according to currently recommended safe practices	-	-	-	-
<b>PC9.</b> sanitize equipment, tools and machinery before and after use	-	-	-	-
<b>PC10.</b> use equipment and materials safely and correctly and return the same to designated storage after use	-	-	-	-
<b>PC11.</b> dispose waste safely and correctly in the designated area	-	-	-	-
<b>PC12.</b> recognize risks to bystanders and take required action to reduce the risks	-	-	-	-

<b>Assessment Criteria for Outcomes</b>	<b>Theory Marks</b>	<b>Practical Marks</b>	<b>Project Marks</b>	<b>Viva Marks</b>
<b>PC13.</b> work in a manner which minimizes environmental damage, ensuring all procedures and instructions for controlling risks are followed	-	-	-	-
<b>PC14.</b> report any accidents, incidents or problems without delay to an appropriate person and take necessary immediate action to reduce further danger	-	-	-	-
<b>PC15.</b> follow government / workplace advisories incase of outbreak of any disease/disaster	-	-	-	-
<i>Administer appropriate emergency procedures</i>	<b>15</b>	<b>5</b>	-	<b>10</b>
<b>PC16.</b> follow procedures for dealing with accidents, fires and emergencies, including communicating location and directions to the location of emergency, as per the workplace requirements	-	-	-	-
<b>PC17.</b> use emergency equipment in accordance with manufacturer's specifications and workplace requirements	-	-	-	-
<b>PC18.</b> provide treatment appropriate to the patient's injuries in accordance with recognized first aid techniques	-	-	-	-
<b>PC19.</b> recover (if practical), clean, inspect/test, refurbish, replace and store the first aid equipment as appropriate	-	-	-	-
<b>PC20.</b> report details of first aid administered in accordance with workplace procedures	-	-	-	-
<b>NOS Total</b>	<b>40</b>	<b>25</b>	-	<b>35</b>

**National Occupational Standards (NOS) Parameters**

<b>NOS Code</b>	AGR/N9903
<b>NOS Name</b>	Maintain health and safety at the workplace
<b>Sector</b>	Agriculture
<b>Sub-Sector</b>	Generic
<b>Occupation</b>	Generic
<b>NSQF Level</b>	4
<b>Credits</b>	1
<b>Version</b>	3.0
<b>Last Reviewed Date</b>	29/09/2023
<b>Next Review Date</b>	29/09/2026
<b>NSQC Clearance Date</b>	29/09/2023



## **DGT/VSQ/N0102: Employability Skills (60 Hours)**

### **Description**

This unit is about employability skills, Constitutional values, becoming a professional in the 21st Century, digital, financial, and legal literacy, diversity and Inclusion, English and communication skills, customer service, entrepreneurship, and apprenticeship, getting ready for jobs and career development.

### **Scope**

The scope covers the following :

- Introduction to Employability Skills
- Constitutional values - Citizenship
- Becoming a Professional in the 21st Century
- Basic English Skills
- Career Development & Goal Setting
- Communication Skills
- Diversity & Inclusion
- Financial and Legal Literacy
- Essential Digital Skills
- Entrepreneurship
- Customer Service
- Getting ready for Apprenticeship & Jobs

### **Elements and Performance Criteria**

#### *Introduction to Employability Skills*

To be competent, the user/individual on the job must be able to:

- PC1.** identify employability skills required for jobs in various industries
- PC2.** identify and explore learning and employability portals

#### *Constitutional values - Citizenship*

To be competent, the user/individual on the job must be able to:

- PC3.** recognize the significance of constitutional values, including civic rights and duties, citizenship, responsibility towards society etc. and personal values and ethics such as honesty, integrity, caring and respecting others, etc.
- PC4.** follow environmentally sustainable practices

#### *Becoming a Professional in the 21st Century*

To be competent, the user/individual on the job must be able to:

- PC5.** recognize the significance of 21st Century Skills for employment
- PC6.** practice the 21st Century Skills such as Self-Awareness, Behaviour Skills, time management, critical and adaptive thinking, problem-solving, creative thinking, social and cultural awareness, emotional awareness, learning to learn for continuous learning etc. in personal and professional life

#### *Basic English Skills*

To be competent, the user/individual on the job must be able to:

- PC7.** use basic English for everyday conversation in different contexts, in person and over the telephone
- PC8.** read and understand routine information, notes, instructions, mails, letters etc. written in English
- PC9.** write short messages, notes, letters, e-mails etc. in English

#### *Career Development & Goal Setting*

To be competent, the user/individual on the job must be able to:

- PC10.** understand the difference between job and career
- PC11.** prepare a career development plan with short- and long-term goals, based on aptitude

#### *Communication Skills*

To be competent, the user/individual on the job must be able to:

- PC12.** follow verbal and non-verbal communication etiquette and active listening techniques in various settings
- PC13.** work collaboratively with others in a team

#### *Diversity & Inclusion*

To be competent, the user/individual on the job must be able to:

- PC14.** communicate and behave appropriately with all genders and PwD
- PC15.** escalate any issues related to sexual harassment at workplace according to POSH Act

#### *Financial and Legal Literacy*

To be competent, the user/individual on the job must be able to:

- PC16.** select financial institutions, products and services as per requirement
- PC17.** carry out offline and online financial transactions, safely and securely
- PC18.** identify common components of salary and compute income, expenses, taxes, investments etc
- PC19.** identify relevant rights and laws and use legal aids to fight against legal exploitation

#### *Essential Digital Skills*

To be competent, the user/individual on the job must be able to:

- PC20.** operate digital devices and carry out basic internet operations securely and safely
- PC21.** use e- mail and social media platforms and virtual collaboration tools to work effectively
- PC22.** use basic features of word processor, spreadsheets, and presentations

#### *Entrepreneurship*

To be competent, the user/individual on the job must be able to:

- PC23.** identify different types of Entrepreneurship and Enterprises and assess opportunities for potential business through research
- PC24.** develop a business plan and a work model, considering the 4Ps of Marketing Product, Price, Place and Promotion
- PC25.** identify sources of funding, anticipate, and mitigate any financial/ legal hurdles for the potential business opportunity

#### *Customer Service*

To be competent, the user/individual on the job must be able to:

- PC26.** identify different types of customers
- PC27.** identify and respond to customer requests and needs in a professional manner.
- PC28.** follow appropriate hygiene and grooming standards

### *Getting ready for apprenticeship & Jobs*

To be competent, the user/individual on the job must be able to:

- PC29.** create a professional Curriculum vitae (Résumé)
- PC30.** search for suitable jobs using reliable offline and online sources such as Employment exchange, recruitment agencies, newspapers etc. and job portals, respectively
- PC31.** apply to identified job openings using offline /online methods as per requirement
- PC32.** answer questions politely, with clarity and confidence, during recruitment and selection
- PC33.** identify apprenticeship opportunities and register for it as per guidelines and requirements

### **Knowledge and Understanding (KU)**

The individual on the job needs to know and understand:

- KU1.** need for employability skills and different learning and employability related portals
- KU2.** various constitutional and personal values
- KU3.** different environmentally sustainable practices and their importance
- KU4.** Twenty first (21st) century skills and their importance
- KU5.** how to use English language for effective verbal (face to face and telephonic) and written communication in formal and informal set up
- KU6.** importance of career development and setting long- and short-term goals
- KU7.** about effective communication
- KU8.** POSH Act
- KU9.** Gender sensitivity and inclusivity
- KU10.** different types of financial institutes, products, and services
- KU11.** how to compute income and expenditure
- KU12.** importance of maintaining safety and security in offline and online financial transactions
- KU13.** different legal rights and laws
- KU14.** different types of digital devices and the procedure to operate them safely and securely
- KU15.** how to create and operate an e- mail account and use applications such as word processors, spreadsheets etc.
- KU16.** how to identify business opportunities
- KU17.** types and needs of customers
- KU18.** how to apply for a job and prepare for an interview
- KU19.** apprenticeship scheme and the process of registering on apprenticeship portal

### **Generic Skills (GS)**

User/individual on the job needs to know how to:

- GS1.** read and write different types of documents/instructions/correspondence
- GS2.** communicate effectively using appropriate language in formal and informal settings
- GS3.** behave politely and appropriately with all
- GS4.** how to work in a virtual mode

- GS5.** perform calculations efficiently
- GS6.** solve problems effectively
- GS7.** pay attention to details
- GS8.** manage time efficiently
- GS9.** maintain hygiene and sanitization to avoid infection

**Assessment Criteria**

<b>Assessment Criteria for Outcomes</b>	<b>Theory Marks</b>	<b>Practical Marks</b>	<b>Project Marks</b>	<b>Viva Marks</b>
<i>Introduction to Employability Skills</i>	<b>1</b>	<b>1</b>	-	-
<b>PC1.</b> identify employability skills required for jobs in various industries	-	-	-	-
<b>PC2.</b> identify and explore learning and employability portals	-	-	-	-
<i>Constitutional values - Citizenship</i>	<b>1</b>	<b>1</b>	-	-
<b>PC3.</b> recognize the significance of constitutional values, including civic rights and duties, citizenship, responsibility towards society etc. and personal values and ethics such as honesty, integrity, caring and respecting others, etc.	-	-	-	-
<b>PC4.</b> follow environmentally sustainable practices	-	-	-	-
<i>Becoming a Professional in the 21st Century</i>	<b>2</b>	<b>4</b>	-	-
<b>PC5.</b> recognize the significance of 21st Century Skills for employment	-	-	-	-
<b>PC6.</b> practice the 21st Century Skills such as Self-Awareness, Behaviour Skills, time management, critical and adaptive thinking, problem-solving, creative thinking, social and cultural awareness, emotional awareness, learning to learn for continuous learning etc. in personal and professional life	-	-	-	-
<i>Basic English Skills</i>	<b>2</b>	<b>3</b>	-	-
<b>PC7.</b> use basic English for everyday conversation in different contexts, in person and over the telephone	-	-	-	-
<b>PC8.</b> read and understand routine information, notes, instructions, mails, letters etc. written in English	-	-	-	-
<b>PC9.</b> write short messages, notes, letters, e-mails etc. in English	-	-	-	-
<i>Career Development &amp; Goal Setting</i>	<b>1</b>	<b>2</b>	-	-

<b>Assessment Criteria for Outcomes</b>	<b>Theory Marks</b>	<b>Practical Marks</b>	<b>Project Marks</b>	<b>Viva Marks</b>
<b>PC10.</b> understand the difference between job and career	-	-	-	-
<b>PC11.</b> prepare a career development plan with short- and long-term goals, based on aptitude	-	-	-	-
<i>Communication Skills</i>	<b>2</b>	<b>2</b>	-	-
<b>PC12.</b> follow verbal and non-verbal communication etiquette and active listening techniques in various settings	-	-	-	-
<b>PC13.</b> work collaboratively with others in a team	-	-	-	-
<i>Diversity &amp; Inclusion</i>	<b>1</b>	<b>2</b>	-	-
<b>PC14.</b> communicate and behave appropriately with all genders and PwD	-	-	-	-
<b>PC15.</b> escalate any issues related to sexual harassment at workplace according to POSH Act	-	-	-	-
<i>Financial and Legal Literacy</i>	<b>2</b>	<b>3</b>	-	-
<b>PC16.</b> select financial institutions, products and services as per requirement	-	-	-	-
<b>PC17.</b> carry out offline and online financial transactions, safely and securely	-	-	-	-
<b>PC18.</b> identify common components of salary and compute income, expenses, taxes, investments etc	-	-	-	-
<b>PC19.</b> identify relevant rights and laws and use legal aids to fight against legal exploitation	-	-	-	-
<i>Essential Digital Skills</i>	<b>3</b>	<b>4</b>	-	-
<b>PC20.</b> operate digital devices and carry out basic internet operations securely and safely	-	-	-	-
<b>PC21.</b> use e- mail and social media platforms and virtual collaboration tools to work effectively	-	-	-	-
<b>PC22.</b> use basic features of word processor, spreadsheets, and presentations	-	-	-	-
<i>Entrepreneurship</i>	<b>2</b>	<b>3</b>	-	-

<b>Assessment Criteria for Outcomes</b>	<b>Theory Marks</b>	<b>Practical Marks</b>	<b>Project Marks</b>	<b>Viva Marks</b>
<b>PC23.</b> identify different types of Entrepreneurship and Enterprises and assess opportunities for potential business through research	-	-	-	-
<b>PC24.</b> develop a business plan and a work model, considering the 4Ps of Marketing Product, Price, Place and Promotion	-	-	-	-
<b>PC25.</b> identify sources of funding, anticipate, and mitigate any financial/ legal hurdles for the potential business opportunity	-	-	-	-
<i>Customer Service</i>	<b>1</b>	<b>2</b>	-	-
<b>PC26.</b> identify different types of customers	-	-	-	-
<b>PC27.</b> identify and respond to customer requests and needs in a professional manner.	-	-	-	-
<b>PC28.</b> follow appropriate hygiene and grooming standards	-	-	-	-
<i>Getting ready for apprenticeship &amp; Jobs</i>	<b>2</b>	<b>3</b>	-	-
<b>PC29.</b> create a professional Curriculum vitae (Résumé)	-	-	-	-
<b>PC30.</b> search for suitable jobs using reliable offline and online sources such as Employment exchange, recruitment agencies, newspapers etc. and job portals, respectively	-	-	-	-
<b>PC31.</b> apply to identified job openings using offline /online methods as per requirement	-	-	-	-
<b>PC32.</b> answer questions politely, with clarity and confidence, during recruitment and selection	-	-	-	-
<b>PC33.</b> identify apprenticeship opportunities and register for it as per guidelines and requirements	-	-	-	-
<b>NOS Total</b>	<b>20</b>	<b>30</b>	-	-

## National Occupational Standards (NOS) Parameters

<b>NOS Code</b>	DGT/VSQ/N0102
<b>NOS Name</b>	Employability Skills (60 Hours)
<b>Sector</b>	Cross Sectoral
<b>Sub-Sector</b>	Professional Skills
<b>Occupation</b>	Employability
<b>NSQF Level</b>	4
<b>Credits</b>	2
<b>Version</b>	1.0
<b>Last Reviewed Date</b>	30/09/2023
<b>Next Review Date</b>	30/09/2026
<b>NSQC Clearance Date</b>	30/09/2023

## Assessment Guidelines and Assessment Weightage

### Assessment Guidelines

1. Criteria for assessment for each Qualification Pack will be created by the Sector Skill Council. Each Performance Criteria (PC) (PC) will be assigned marks proportional to its importance in NOS. SSC will also lay down proportion of marks for Theory and Skills Practical for each PC.
2. The assessment for the theory part will be based on knowledge bank of questions created by the SSC.
3. Individual assessment agencies will create unique question papers for theory part for each candidate at each examination/training center (as per assessment criteria below).
4. Individual assessment agencies will create unique evaluations for skill practical for every student at each examination/ training center based on these criteria.
5. In case of successfully passing only certain number of NOSs, the trainee is eligible to take subsequent assessment on the balance NOS's to pass the Qualification Pack.
6. In case of unsuccessful completion, the trainee may seek reassessment on the Qualification Pack

### Minimum Aggregate Passing % at QP Level : 70

**(Please note:** Every Trainee should score a minimum aggregate passing percentage as specified above, to



successfully clear the Qualification Pack assessment.)

## Assessment Weightage

Compulsory NOS

National Occupational Standards	Theory Marks	Practical Marks	Project Marks	Viva Marks	Total Marks	Weightage
AGR/N8102.Prepare for plant tissue culture	30	40	-	30	100	25
AGR/N8103.Carry out plant tissue culture	30	40	-	30	100	25
AGR/N8115.Transplant the tissue cultured plants and maintain records	30	40	-	30	100	30
AGR/N9903.Maintain health and safety at the workplace	40	25	-	35	100	15
DGT/VSQ/N0102.Employability Skills (60 Hours)	20	30	0	0	50	5
<b>Total</b>	<b>150</b>	<b>175</b>	<b>-</b>	<b>125</b>	<b>450</b>	<b>100</b>

## Acronyms

<b>NOS</b>	National Occupational Standard(s)
<b>NSQF</b>	National Skills Qualifications Framework
<b>QP</b>	Qualifications Pack
<b>TVET</b>	Technical and Vocational Education and Training

**Glossary**

<b>Sector</b>	Sector is a conglomeration of different business operations having similar business and interests. It may also be defined as a distinct subset of the economy whose components share similar characteristics and interests.
<b>Sub-sector</b>	Sub-sector is derived from a further breakdown based on the characteristics and interests of its components.
<b>Occupation</b>	Occupation is a set of job roles, which perform similar/ related set of functions in an industry.
<b>Job role</b>	Job role defines a unique set of functions that together form a unique employment opportunity in an organisation.
<b>Occupational Standards (OS)</b>	OS specify the standards of performance an individual must achieve when carrying out a function in the workplace, together with the Knowledge and Understanding (KU) they need to meet that standard consistently. Occupational Standards are applicable both in the Indian and global contexts.
<b>Performance Criteria (PC)</b>	Performance Criteria (PC) are statements that together specify the standard of performance required when carrying out a task.
<b>National Occupational Standards (NOS)</b>	NOS are occupational standards which apply uniquely in the Indian context.
<b>Qualifications Pack (QP)</b>	QP comprises the set of OS, together with the educational, training and other criteria required to perform a job role. A QP is assigned a unique qualifications pack code.
<b>Unit Code</b>	Unit code is a unique identifier for an Occupational Standard, which is denoted by an 'N'
<b>Unit Title</b>	Unit title gives a clear overall statement about what the incumbent should be able to do.
<b>Description</b>	Description gives a short summary of the unit content. This would be helpful to anyone searching on a database to verify that this is the appropriate OS they are looking for.
<b>Scope</b>	Scope is a set of statements specifying the range of variables that an individual may have to deal with in carrying out the function which have a critical impact on quality of performance required.
<b>Knowledge and Understanding (KU)</b>	Knowledge and Understanding (KU) are statements which together specify the technical, generic, professional and organisational specific knowledge that an individual needs in order to perform to the required standard.

<b>Organisational Context</b>	Organisational context includes the way the organisation is structured and how it operates, including the extent of operative knowledge managers have of their relevant areas of responsibility.
<b>Technical Knowledge</b>	Technical knowledge is the specific knowledge needed to accomplish specific designated responsibilities.
<b>Core Skills/ Generic Skills (GS)</b>	Core skills or Generic Skills (GS) are a group of skills that are the key to learning and working in today's world. These skills are typically needed in any work environment in today's world. These skills are typically needed in any work environment. In the context of the OS, these include communication related skills that are applicable to most job roles.
<b>Electives</b>	Electives are NOS/set of NOS that are identified by the sector as contributive to specialization in a job role. There may be multiple electives within a QP for each specialized job role. Trainees must select at least one elective for the successful completion of a QP with Electives.
<b>Options</b>	Options are NOS/set of NOS that are identified by the sector as additional skills. There may be multiple options within a QP. It is not mandatory to select any of the options to complete a QP with Options.