

## Self-Assessment Checklist

<b>Candidate Name</b>	
<b>Registration No.</b>	
<b>Qualification</b>	National Vocational Certificate level 2 to 5, in Agriculture Sector (Soil, water and fertilizer testing lab technician)
<b>Competency Standards</b>	<b>Perform Carbonates &amp; Bicarbonates test by Titrimetric Method</b>
<b>Assessment Task</b>	<b>Assess the carbonates and bicarbonates in the water sample using the acid base titration process.</b>

I can.....

Performance Criteria	Yes	No
1. Check sample label for required test	<input type="checkbox"/>	<input type="checkbox"/>
2. Keep sample at required temperature	<input type="checkbox"/>	<input type="checkbox"/>
3. Ensure availability of standard solutions according to test procedure	<input type="checkbox"/>	<input type="checkbox"/>
4. Set equipment according to test requirement	<input type="checkbox"/>	<input type="checkbox"/>
5. Wash all glassware as per lab procedure	<input type="checkbox"/>	<input type="checkbox"/>
6. Standardize H <sub>2</sub> SO <sub>4</sub> Normal solution with specified work instructions	<input type="checkbox"/>	<input type="checkbox"/>
7. Conduct pre-use and safety checks	<input type="checkbox"/>	<input type="checkbox"/>
8. Take required amount of sample in titration flask according to procedural requirement	<input type="checkbox"/>	<input type="checkbox"/>
9. Add phenolphthalein indicator and check for presence of carbonates as per procedure	<input type="checkbox"/>	<input type="checkbox"/>
10. Titrate sample against known concentration of H <sub>2</sub> SO <sub>4</sub> solution as per procedure	<input type="checkbox"/>	<input type="checkbox"/>
11. Note down reading according to lab format for carbonate	<input type="checkbox"/>	<input type="checkbox"/>
12. Add Methyl orange indicator and check for presence of bicarbonates as per procedure	<input type="checkbox"/>	<input type="checkbox"/>
13. Titrate sample against known concentration of H <sub>2</sub> SO <sub>4</sub>	<input type="checkbox"/>	<input type="checkbox"/>

solution as per procedure		
14. Note down reading according to lab format for bicarbonate	<input type="text"/>	<input type="text"/>
15. Perform replicate test as per standard procedure	<input type="text"/>	<input type="text"/>
16. Calculate final reading according to procedure	<input type="text"/>	<input type="text"/>
17. Standardize $\text{H}_2\text{SO}_4$ solution as per lab quality assurance plan	<input type="text"/>	<input type="text"/>
18. Run blank sample accordingly	<input type="text"/>	<input type="text"/>
19. Run Laboratory Control samples as per standard	<input type="text"/>	<input type="text"/>
20. Perform replicate/re-testing as per lab standards	<input type="text"/>	<input type="text"/>
21. Record quality control data as per lab procedure	<input type="text"/>	<input type="text"/>
22. Calculate and Note down results on analyst workbook	<input type="text"/>	<input type="text"/>
23. Record results on result record form and submit to reporting section	<input type="text"/>	<input type="text"/>
24. Clear and restore work area	<input type="text"/>	<input type="text"/>
25. Handle Sulphuric acid according to lab safety protocols.	<input type="text"/>	<input type="text"/>
26. Ensure use of desiccated Sodium Carbonate for standardization as per SOP.	<input type="text"/>	<input type="text"/>
27. Avoid loss of dissolved gasses during titration	<input type="text"/>	<input type="text"/>

Candidate's Signature \_\_\_\_\_

Assessor's Signature \_\_\_\_\_

Date: \_\_\_\_\_

## Instruction Sheet for the Candidate

<b>Qualification</b>	<b>National Vocational Certificate level 2 to 5, in Agriculture Sector (Soil, water and fertilizer testing lab technician)</b>
<b>Competency Standard(s)</b>	<b>Perform Carbonates &amp; Bicarbonates test by Titrimetric Method</b>
Candidate Details	
Guidance for Candidate	<p><b>To meet this standard, you are required to complete the following within the given time frame (for practical demonstration &amp; assessment):</b></p> <p><b>Assess the carbonates and bicarbonates in the water sample using the acid base titration process.</b></p>
Time:240 Mins	<p>During a practical assessment, under observation by an assessor, you are required to</p> <p><b>Assess the carbonates and bicarbonates in the water sample using the acid base titration process..</b> Demonstrate the following criteria:</p> <ol style="list-style-type: none"> <li>1. Check sample label for required test</li> <li>2. Keep sample at required temperature</li> <li>3. Ensure availability of standard solutions according to test procedure</li> <li>4. Set equipment according to test requirement</li> <li>5. Wash all glassware as per lab procedure</li> <li>6. Standardize H<sub>2</sub>SO<sub>4</sub> Normal solution with specified work instructions</li> <li>7. Conduct pre-use and safety checks</li> <li>8. Take required amount of sample in titration flask according to procedural requirement</li> <li>9. Add phenolphthalein indicator and check for presence of carbonates as per procedure</li> </ol>

Minimum Evidence Required	<ol style="list-style-type: none"> <li>10. Titrate sample against known concentration of <math>\text{H}_2\text{SO}_4</math> solution as per procedure</li> <li>11. Note down reading according to lab format for carbonate</li> <li>12. Add Methyl orange indicator and check for presence of bicarbonates as per procedure</li> <li>13. Titrate sample against known concentration of <math>\text{H}_2\text{SO}_4</math> solution as per procedure</li> <li>14. Note down reading according to lab format for bicarbonate</li> <li>15. Perform replicate test as per standard procedure</li> <li>16. Calculate final reading according to procedure</li> <li>17. Standardize <math>\text{H}_2\text{SO}_4</math> solution as per lab quality assurance plan</li> <li>18. Run blank sample accordingly</li> <li>19. Run Laboratory Control samples as per standard</li> <li>20. Perform replicate/re-testing as per lab standards</li> <li>21. Record quality control data as per lab procedure</li> <li>22. Calculate and Note down results on analyst workbook</li> <li>23. Record results on result record form and submit to reporting section</li> <li>24. Clear and restore work area</li> <li>25. Handle Sulphuric acid according to lab safety protocols.</li> <li>26. Ensure use of desiccated Sodium Carbonate for standardization as per SOP.</li> <li>27. Avoid loss of dissolved gasses during titration</li> </ol>
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## Assessors Judgment Guide

<b>Qualification</b>	National Vocational Certificate level 2 to 5, in Agriculture Sector (Soil, water and fertilizer testing lab technician)
<b>Competency Standard(s)</b>	<b>Perform Carbonates &amp; Bicarbonates test by Titrimetric Method</b>
<b>Candidate Details</b>	Name: _____  Registration/Roll Number: _____ Signature: _____
<b>Assessment Outcome</b>	<div style="display: flex; justify-content: space-around; align-items: center;"> <span>COMPETENT <input type="checkbox"/></span> <span>NOT YET COMPETENT <input type="checkbox"/></span> </div> Name of the Assessor _____ Assessor's code: _____  Signature: _____

Assessment Summary (to be filled by the assessor)							
Activity	Method					Result	
Nature of Activity	Written	Oral	Observation	Portfolio	Role Play	Competent	Not Yet Competent
Practical Skill Demonstration			✓				
Knowledge Assessment		✓					
Other Requirement							

## Observation Checklist

Assessment Task		Assess the carbonates and bicarbonates in the water sample using the acid base titration process.		
During the practical assessment, candidate demonstrated the following:		Yes	No	Remarks
1.	Checked sample label for required test			
2.	Kept sample at required temperature			
3.	Ensured availability of standard solutions according to test procedure			
4.	Set equipment according to test requirement			
5.	Washed all glassware as per lab procedure			
6.	Standardized H <sub>2</sub> SO <sub>4</sub> Normal solution with specified work instructions			
7.	Conducted pre-use and safety checks			
8.	Took required amount of sample in titration flask according to procedural requirement			
9.	Added phenolphthalein indicator and check for presence of carbonates as per procedure			
10	Titrated sample against known concentration of H <sub>2</sub> SO <sub>4</sub> solution as per procedure			
11	Noted down reading according to lab format for carbonate			
12	Added Methyl orange indicator and check for presence of bicarbonates as per procedure			
13	Titrated sample against known concentration of H <sub>2</sub> SO <sub>4</sub> solution as per procedure			
14	Noted down reading according to lab format for bicarbonate			
15	Performed replicate test as per standard procedure			
16	Calculated final reading according to procedure			

17	Standardized H <sub>2</sub> SO <sub>4</sub> solution as per lab quality assurance plan			
18	Run blank sample accordingly			
19	Run Laboratory Control samples as per standard			
20	Performed replicate/re-testing as per lab standards			
21	Recorded quality control data as per lab procedure			
22	Calculated and Note down results on analyst workbook			
23	Recorded results on result record form and submit to reporting section			
24	Cleared and restore work area			
25	Handled Sulphuric acid according to lab safety protocols.			
26	Ensured use of desiccated Sodium Carbonate for standardization as per SOP.			
27	Avoided loss of dissolved gasses during titration			
Competent <input type="checkbox"/>		Not Yet Competent <input type="checkbox"/>		

<b>Feedback to the Candidate</b>

<b>Candidate's Signature</b> _____ <b>Assessor's Signature</b> _____