

051106T4APB

APPLIED BIOLOGY LEVEL 6

APB/OS/AB/CR/01/6/A

Carry out Cytological and Histological Techniques

March/April 2025



**TVET CURRICULUM DEVELOPMENT, ASSESSMENT AND CERTIFICATION
COUNCIL (TVET CDACC)**

PRACTICE

INSTRUCTIONS TO ASSESSOR

1. Assess the candidate as the practical progresses observing the critical areas
2. You are required to Mark the practical as the candidate perform the tasks
3. You are required to take video clips at critical points
4. Ensure the candidate has a name tag and registration code at the back and front

OBSERVATION CHECKLIST

Candidate's Name & Registration Code			
Assessors Name & Registration Code			
Venue of Assessment			
Date of Assessment			
Items to be Evaluated: <i>Please award Marks as appropriate. Give a brief comment on your observation.</i>	Marks Available	Marks Obtained	Comments
TASK 1: Observe Mitosis in an Onion Root Tips			
1. Wore appropriate PPEs • Face mask • Lab coat • Disposable hand gloves • Closed shoes <i>(Award 1 Mark or 0 for each)</i>	4		
2. Prepared the Root Tips • Cleaned the onion roots with clean running water • Chopped off about 1 cm long of the root tips from the onion bulb using a scalpel blade <i>(Award 1 Mark or 0 for each)</i>	2		
3. Fixed the Root Tip Cells • Placed 3 ml of acetic acid in a petri dish • Placed the chopped root tips in the acetic acid • Allowed the set up to stand for 5 minutes	3		

<i>(Award 1 Mark for each or 0)</i>			
4. Hydrolyzed the Root Tips - Transferred the contents of the petri dish into a clean watch glass - Heat the watch glass and its contents over a Bunsen burner flame for a minute to soften the cell wall - Let the set up to cool <i>(Award 1 Mark or 0 for each)</i>	3		
5. Stained the Root Tips - Transferred the root tips onto the clean slide - Added a drop of aceto-orcin stain or methylene blue stain. - Heat the slide gently over a Bunsen burner flame to intensify the stain <i>(Award 1 Mark or 0 for each)</i>	3		
6. Squash Preparation - Placed a cover slip over the root tips - Tapped the coverslip with the blunt end of a pencil gently to spread the cells. <i>(Award 1 Mark or 0 for each)</i>	2		
7. Microscopic examination - Placed the slide on the microscope stage - Secured the slide using the stage clips - Switched the lower objective lens into place by rotating the revolving nose piece	6		

• Raised the stage using the coarse adjustment knob to get a rough focus • Visualized the region of cell division (meristematic cells) • Used high power objective lens to focus individual cells <i>(Award 1 Mark for each or 0)</i>			
8. Identified Stages of Cell Division and Associated Structures Stages: • Prophase • Metaphase • Anaphase • Telophase <i>(Award 2 Marks or 0 for each)</i> Structures: • Chromosomes, spindle fibers, a cell plate <i>(Award 1 Mark or 0 for each)</i> Expected Results: • Observation of various stages of mitosis in onion root tip cells – prophase, metaphase, anaphase, and telophase • Identification of different cell structures, such as chromosomes, spindle fibers, and cell plate. <i>(Award 1 Mark or 0 for each)</i>	11		
Sub-Total 1	34		

TASK 2: Investigate The Effects of Different Osmotic Solutions on Plant Cells			
9. Prepared solutions - Prepared 50ml 10% NaCl solution: Weighed 5g of NaCl and dissolved 50ml of water - Prepared 50ml 30% Sucrose solution: Weighed 15g of sucrose solution and dissolved in 50ml of water <i>(Award 2 Marks or 0 for each)</i>	4		
10. Prepared the control slide - Placed a small piece of Elodea leaf on a slide. - Added a drop of distilled water - Allowed the sept stand for 5 mi - Placed a coverslip over the leaf <i>(Award 1 Mark for each or 0)</i>	4		
11. Prepared slide: Hypertonic Solution Slide - Placed a small piece of Elodea leaf on a slide. - Added a drop of 10% NaCl solution - Allowed the set up stand for 5 minutes - Covered with a coverslip <i>(Award 1 Mark or 0 for each)</i>	4		
12. Prepared slide: Hypotonic Solution Slide - Placed a small piece of Elodea leaf on a slide. - Added a drop of 30% sucrose solution	4		

- Allowed the setup stand for 5 minutes - Covered with a coverslip. <i>(Award 1 Mark or 0 for each)</i>			
1. Microscopic Observation for the Three Slides(Hypotonic Solution Slide, Hypertonic Solution Slide and control slide) - Observed the cells under a microscope at low and high power. - Noted the appearance of the cells in each slide. Paid attention to the cell wall, cell membrane, and cytoplasm. - Drew diagrams of the cells, labeling the observed structures Expected Results: Control Slide: Cells will appear tu with the cell membrane pressed ag the cell wall. Hypertonic Solution Slide: Cells will appear plasmolyzed, with the cell membrane pulled away from the cell wall. Hypotonic Solution Slide: Cells may appear turgid or slightly swollen, depending on the initial water potential of the cells. <i>(Award 2 Marks or 0 for each)</i>	12		
Sub-Total 2	28		
GRAND TOTAL	62		

ASSESSMENT OUTCOME	
The candidate was found to be: Competent ☐ Not yet Competent ☐ <i>(Please tick as appropriate)</i> <i>(The candidate is competent if the candidate obtains at least 50%)</i>	
Feedback from the Candidate:	
Feedback to the Candidate:	
Candidate Signature	Date:
Assessor's Signature	Date