

071106T4SLT

SCIENCE LABORATORY TECHNOLOGY LEVEL 6

SLT/OS/SL/CR/02/6/A

APPLY PHYSICS TECHNIQUES

Oct/Nov 2024

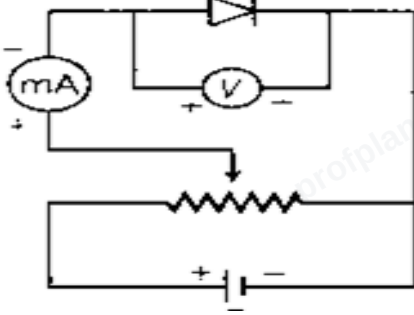


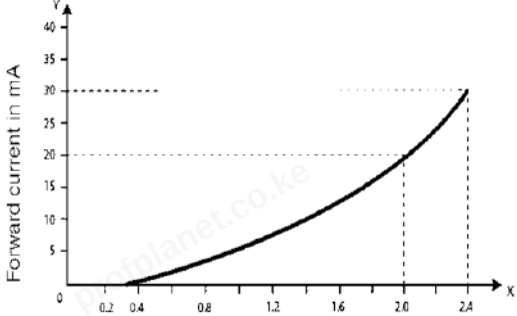
**TVET CURRICULUM DEVELOPMENT, ASSESSMENT AND
CERTIFICATION COUNCIL (TVET CDACC)**

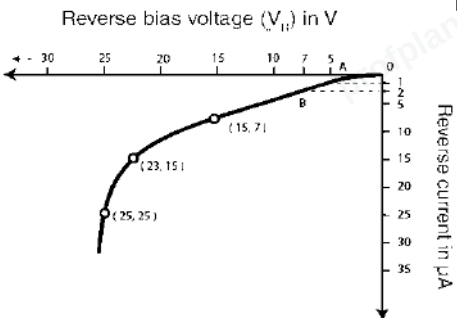
PRACTICAL ASSESSMENT

OBSERVATION CHECKLIST

Candidate's name & Registration			
Assessor's name & Registration Co			
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: DETERMINING THE FORWARD CHARACTERISTICS OF A P-N JUNCTION DIODE			
1. Donned the PPEs as per the OSHA guidelines. - lab coat - closed shoes <i>(Award 1 mark or 0 for each PPE donned)</i>	2		
2. Set up the circuit for forward bias as follows Milliammeter and diode connected in series	6		

• Voltmeter connected across the variable resistor and diode • Cells connected in series • P-type of the diode connected to the positive terminal of the cells • N-type of the diode connected to the negative terminal of the cells • Drew a sketch of the circuit for forward bias  (Award 6 marks or 0 for correct arrangement of experimental set up)															
3. Increased the forward bias voltage in steps from zero (at least five steps) 4. Recorded values of voltage and the corresponding values of current in a table 5. Used the results in the table to plot a graph of I (mA) against Voltage (V_{FB}) (Award 2 marks for each set of I(mA) and Voltage V_{FB} data values. $2 \times 5 = 10$ marks)	10														
6. Presented data in a table format. <table border="1" data-bbox="266 1704 809 1874"><tr><td>I (mA)</td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>V_{FB}</td><td></td><td></td><td></td><td></td><td></td></tr></table> (Award 2 marks for table or zero if data is not tabulated)	I (mA)						V_{FB}						2		
I (mA)															
V_{FB}															

7. Plotted a graph of I (mA) against Voltage (V_{FB}) for forward bias  I-V Characteristic Curve of a P-N Junction in Forward Bias <i>(Award 1 mark if at least 3 points fall on the curve , 1 mark for correct scale, 1 mark correct title of the graph, 2 marks for correctly labeled axes and 1 mark each for correctly plotted point (1 × 5 = 5) (Total: 1 + 1 + 1 + 2 + 5 = 10 marks)</i>	10		
8. Determined the cut in (break-point voltage for forward bias <i>(Award 1 mark or 0)</i>			
9. Set up the circuit for reverse bias as follows • Milliammeter and diode connected in series • Voltmeter connected across the variable resistor • Cells connected in series • P-type of the diode connected to the negative terminal of the cells • N-type of the diode connected to the positive terminal of the cells • Drew a sketch of the circuit for reverse bias	6		

(Award 6 marks or 0 for correct arrangement of experimental set up)															
10. Repeated the steps as indicated in number 3,4 and 5 above (Award 2 marks for each set of $I(\text{mA})$ and Voltage V_{RB} data values. $2 \times 5 = 10$ marks)	10														
11. Presented data in a table format. <table border="1"><tr><td>I (mA)</td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>V_{RB}</td><td></td><td></td><td></td><td></td><td></td></tr></table> (Award 2 marks for table or zero if data is not tabulated)	I (mA)						V_{RB}						2		
I (mA)															
V_{RB}															
12. Plotted a graph of I (mA) against Voltage (V_{RB}) for reverse bias  I-V Characteristic Curve of a P-N Junction in Reverse Bias (Award 1 mark if at least 3 points fall on the curve, 1 mark for correct scale, 1 mark correct title of the graph, 2 marks for correctly labeled axes and 1 mark each for correctly plotted point ($1 \times 5 = 5$) (Total: $1 + 1 + 1 + 2 + 5 = 10$ marks)	10														
13. Determined the zener voltage (break-down) voltage for reverse bias (Award 1 mark or 0)	1														
14. Clearing up the practical	5														

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• Dismantled circuits • Assembled all the apparatus • Cleaned up the working area • Returned / complied with instructions on clearing up • Observed safety of self and others (Award 1 or 0 mark @ for every behavior observed. 1 x 5 max = 5marks)			
Total	65		
ASSESSMENT OUTCOME			
The candidate was found to be: Competent ☐ Not yet competent ☐ <i>(Please tick as appropriate)</i> (The candidate is competent if the can at least 50%)			
Feedback from candidate:			
Feedback to candidate:			
Candidate's Signature		Date	
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Assessor's Signature		Date	
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