**Portfolio of evidence**

UEECD0052

**Use of routine equipment**

 

**UEE Training Package Support Material**

**Based on:**

**National Electrotechnology Industry Standards**

North Metropolitan TAFE

V1 July 2022

|  |  |  |  |
| --- | --- | --- | --- |
| **Student Name** |  | **Assessment Type** |[ ]  Questioning (Oral / Written) |
| **Student ID** |  |  |[x]  Portfolio |
| **Lecturer Name** |  | **Total Marks** |  |
| **Student Result (S/NYS)** |  |
| By completing and submitting this signed form to my lecturer, I am stating that:1. The attached submission is completely my own work
2. I have correctly cited all sources of information used in this work (if required)
3. I understand a copy of my assessment will be kept by the NMTAFE for their records
4. I understand my assessment may be selected for use in the NMTAFE’s validation and audit process to ensure student assessment meets requirements
 |
| **Student Signature** |  | **Date** |  |

**Assessment type ():**

[ ]  Questioning (Oral/Written)

[ ]  Practical Demonstration

[ ]  3rd Party Report

[x]  Other – Project/Portfolio (*please specify)*

**Assessment Resources:**

|  |
| --- |
| **Resources the assessor is to provide:** * Classroom setting as the venue.
* Test paper
* Graph paper

**Resources the candidate is to provide:*** Black or Blue pen
* Pencil and eraser
* Scientific calculator (non-programmable)
* Maths drawing set
* AS/NZS 3000: current edition
* AS/NZS 3008.1.1 current edition
* WA Electrical Requirements current edition
 |

**Assessment Instructions:**

|  |
| --- |
| Task description:The following Portfolio Assessment relates to the knowledge requirements and performance evidence of the unit. Make sure you complete all questions and practical activities* To be deemed ***Satisfactory*** you are required to achieve a mark of **100%**
* The following **Knowledge Assessment** is an open book assessment and does not need to be completed under supervision
* The following **Practical Activities** must be completed under supervision in a simulated workplace environment
* If ***Not Yet Satisfactory*** you will be required to re-attempt the **Knowledge Questions** that are marked ***not satisfactory*** and/or any **Practical Activity**marked as **Not Yet Satisfactory**
 |
| **Student Instructions:** Ensure you have access to all the resources required for this assessment as described below.1. Read the **Questions** section. If you are not clear about a question, ask your assessor for further information.
2. You may be able to complete the questions verbally. This would need to be negotiated with your assessor**.**
3. Your assessor will provide feedback on your answers, including any questions that may require a further response.
4. If you have specific needs that you would like considered during this assessment, please discuss this with your assessor to identify any possible reasonable adjustments **prior** to commencing the assessment.
5. All diagrams must be neat, labelled and in pencil.
6. All calculations and numerical answers must be shown correct to two decimal places and include both the unit of measurement and metric prefix if applicable.
 |

**Complete all Knowledge Questions.**

|  |  |  |
| --- | --- | --- |
| **Q1.** | Circuits are logically divided into several categories. The six typical circuits groups are: | 3 marks |
| a |  |
| b |  |
| c |  |
| d |  |
| e |  |
| f |  |
| **Feedback**  |   | ​​☐​  Satisfactory ​​☐​  Not satisfactory  |

|  |  |  |
| --- | --- | --- |
| **Question 2** | What important electrical test must be carried out before commencing work on any low-voltage electrical circuit?  | 1 mark  |
| **Answer**  |  |
| **Feedback**  |   | ​​☐​  Satisfactory ​​☐​  Not satisfactory  |

|  |  |  |
| --- | --- | --- |
| **Question 3** | Which statements best explain the need of attaching a “Danger Tag” to a circuit breaker? More than one answer is required. | 1 mark |
| **Answer** | **A** | Warn people not to switch the power off  |
| **B** | Warn people not to switch the power on  |
| **C** | Advise that people are working on the circuit  |
| **D** | Advise that the workers have gone home and won’t be back until tomorrow  |
| **Feedback** |  | [ ]  Satisfactory[ ]  Not satisfactory |

|  |  |  |
| --- | --- | --- |
| **Question 4** | What is the name given to the device that prevents persons getting an electric shock at the Main Switchboard? | 1 mark |
| **Answer** | **A** | Control switch  |
| **B** | Main switch  |
| **C** | Circuit Breaker  |
| **D** | Residual Current Device  |
| **Feedback** |  | [ ]  Satisfactory[ ]  Not satisfactory |

|  |  |  |
| --- | --- | --- |
| **Question 5** | What is the name given to the device that is used to protect final sub-circuits from over-current at the Main Switchboard? | 1 mark |
| **Answer** | **A** | Control switch  |
| **B** | Main switch  |
| **C** | Circuit Breaker  |
| **D** | Residual Current Device  |
| **Feedback** |  | [ ]  Satisfactory[ ]  Not satisfactory |

|  |  |  |
| --- | --- | --- |
| **Question 6** | What is the name given to the device that is used to isolate all power at the Main Switchboard? | 1 mark |
| **Answer** | **A** | Control switch  |
| **B** | Main switch  |
| **C** | Circuit Breaker  |
| **D** | Residual Current Device  |
| **Feedback** |  | [ ]  Satisfactory[ ]  Not satisfactory |

**Practical Activities Overview**

**You are required to:**

Verify the voltage relationships in a single-phase double-wound step-down transformer, using:

**Equipment**

-Single phase variable voltage A.C. supply (Variac)

-Single phase 24 V double wound step-down transformer project board

-Load board (60 Watt incandescent lamp or similar)

-Connecting leads.

-Multimeter.

# Risk assessment

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **1** | **2** | **3** | **4** | **5** |
| **Consequence** | **Rare****T**he event may occur in exceptional circumstances | **Unlikely**The event could occur sometimes | **Moderate**The event should occur sometimes | **Likely**The event will probably occur in most circumstances | **Almost Certain**The event is expected to occur in most circumstances |
| **1** | **Insignificant**No injuries or health issues | **LOW** | **LOW** | **LOW** | **LOW** | **MODERATE** |
| **2** | **Minor**First aid treatment | **LOW** | **LOW** | **MODERATE** | **MODERATE** | **HIGH** |
| **3** | **Moderate**Medical treatment, potential LTI | **LOW** | **MODERATE** | **HIGH** | **HIGH** | **CRITICAL** |
| **4** | **Major**Permanent disability or disease | **LOW** | **MODERATE** | **HIGH** | **CRITICAL** | **CATASTROPHIC** |
| **5** | **Extreme**Death | **MODERATE** | **HIGH** | **CRITICAL** | **CATASTROPHIC** | **CATASTROPHIC** |



**Safe Work Method Statement**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Revised****Risk Rating** |  |  |  |  |  |  |  |
| **Hazard****Control****Measures** |  |  |  |  |  |  |  |
| **Risk****Rating** |  |  |  |  |  |  |  |
| **Hazards** |  |  |  |  |  |  |  |
| **Task Steps** |  |  |  |  |  |  |  |
| **Task Step****#** |  |  |  |  |  |  |  |

**Task A: Verify the voltage relationships in a single-phase double-wound step-down transformer.**

**1.** Read the task instructions (scope of work) for this assessment, ensure that you understand what is required and seek advice from your supervisor for anything that you need advice or assistance on. Complete the pre-activity job hazard analysis documentation.

**2.** Obtain and source all of the required tools and equipment for this task; consult the equipment list (scope of work) above to clarify what is required.

**3.** Examine the Transformer supplied and record the manufacturer specifications below

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| VA RATING  |    | PRI VOLTAGE  |    | SEC VOLTAGE  |    |   |

**Knowledge Q 7.** With reference the manufacturers specification, is the transformer a step up or step-down Transformer?

ANSWER\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**4.** Measure the resistance of the two windings on the double wound step-down transformer and identify the primary winding. Record the resistance of both windings in the Results Table.

**5.** Connect the circuit according to the circuit diagram above.

**6.** Check for short circuits with a multimeter. Switch the multimeter off after the check.

**7.** Have your circuit checked by your supervisor/Lecturer.

**8.** Set the variable A.C. supply (Variac) to 25% of its full value and measure the primary and

secondary voltages with a Voltmeter. Record your results in the Results Table.

**9.** Repeat Step 8. with the Variac set to approximately 50%, 75% and 100% of the supply voltage.

**10.** Switch the circuit off, remove the plug from the outlet and attach your danger tag to the plug top.

**11.** Have your results checked by your Lecturer.

**12.** Return all equipment to its proper place, clean up your work area/site. Recycle and/or retain materials in line with sustainability principles for future use.

**Student to Complete: Results Table**

|  |  |  |  |
| --- | --- | --- | --- |
| Primary Resistance  | Ω  | Secondary Resistance  | Ω  |
| Variac Setting  | Primary Voltage  | Secondary Voltage  | Calculated Voltage      Ratio  |
| 25% Voltage  |    |    |    |
| 50% Voltage  |    |    |    |
| 75% Voltage  |    |    |    |
| 100% Voltage  |    |    |   |

**Observation checklist**

|  |  |  |
| --- | --- | --- |
| **During this assessment, did the student:**  | **Yes**  | **No**  |
| **Task A: Verify the voltage relationships in a single-phase double-wound step-down transformer**  |
| 1  | Obtain scope of work or instructions: * Read, interpret work instructions. Follow instructions correctly.
* Complete the pre-activity job hazard analysis documentation.
* Consult supervisor, seek advice as required. Work cohesively with others as required.
 |   |   |
| 2  | Source and obtain required tools or equipment. * Obtain required hand tools
* Obtain required electrotechnology tools (multimeter)
* Obtain required equipment e.g. circuits; transformers.
* All materials and tools are checked and used appropriately.
 |   |   |
| 3  | Examine the Transformer supplied and record the manufacturer specifications. * Manufacturer specifications are located & correctly recorded
 |   |   |
| 4  | Measure the resistance of the two windings on the transformer: * Identify the primary winding.
* Record the resistance of both windings in the Results Table.
 |   |   |
| 5  | Connect the circuit  * Circuit is safly connected according to the circuit diagram
 |   |   |
| 6  | Check for short circuits: * Correctly handle & use the multimeter.
* Identify any short circuits.
* Switch the multimeter off after the check.
* All work is conducted safely, appropriate PPE is used if required.
 |   |   |
| 7  | Have the circuit checked by your supervisor/Lecturer.  |   |   |
| 8  | Measure variations in the circuit: * Set the variable A.C. supply (Variac) to 25% of its full value and measure the primary and secondary voltages with a Voltmeter.
* Repeat with the Variac set to approximately 50%, 75% and 100% of the supply voltage
* Record results in the Results Table.
 |   |   |
| 9  | End measurement works: * Switch the circuit off,
* Remove the plug from the outlet and attach your danger tag to the plug top.
* Ensure overall work is completed in a timely manner
* Have results checked by Lecturer.
 |   |   |
| 10  | Clean up, documentation & sustainability: * Return all equipment to its proper place,
* Clean up your work area/site.
* Ensure any relevant documentation is complete
* Identify any re-usable components; adhere to sustainable practices.
 |   |   |
| **Overall Assessment Result:**  | **S**  | **NYS**  |
| Feedback Notes for student:  |
|    |
| Details of any re-sit if required (date; time; location);  |
|   |

**Practical Activity**

|  |
| --- |
| **Reasonable Adjustment**  |
| **Adjustment Required** | [ ]  **Yes** | [ ]  **No** |
| **Describe the adjustments that have been made to the assessment:** |
| **Assessor name and signature** |  | **Date** |  |
| **Student name and signature** |  | **Date** |  |

|  |  |  |
| --- | --- | --- |
| **Assessment Outcome****Knowledge Questions** | [ ]  **Satisfactory** | [ ]  **Not Satisfactory** |
| **Assessment Outcome****Practical Activities** | [ ]  **Satisfactory** | [ ]  **Not Satisfactory** |
| **Knowledge Questions / Practical Activity Feedback:****Actions Required if Not Satisfactory:** |
| **Assessor name and signature** |  | **Date** |  |
| **Student name and signature** |  | **Date** |  |