Lighting Circuits and Maintenance Assessment

Introduction

This assessment is designed to evaluate students' understanding of the basic components of a lighting circuit, their ability to identify common lighting circuit faults, and their knowledge of routine maintenance procedures for lighting systems.

The assessment is intended for students aged 16-18 in the subject area of Electrical Engineering, specifically focusing on Lighting Circuits and Maintenance.

Section 1: Multiple Choice Questions

Choose the correct answer for each question.

1. What is the primary function of a fuse in a lighting circuit?
   - A) To regulate voltage
   - B) To protect against overcurrent
   - C) To filter out noise
   - D) To boost power

2. Which of the following is a common type of lighting circuit?
   - A) Series circuit
   - B) Parallel circuit
   - C) Combination circuit
   - D) All of the above

3. What is the purpose of a ballast in a fluorescent lighting circuit?
   - A) To regulate voltage
   - B) To protect against overcurrent
   - C) To filter out noise
   - D) To provide starting voltage

4. What is the primary safety concern when working with lighting circuits?
   - A) Electrical shock
   - B) Fire hazard
   - C) Overheating
   - D) All of the above

5. What is the recommended frequency for cleaning lighting fixtures in a commercial building?
    - A) Daily
    - B) Weekly
    - C) Monthly
    - D) Quarterly

Section 2: Short Answer Questions

Answer each question in complete sentences.

1. Describe the symptoms of a faulty ballast in a fluorescent lighting circuit. (5 marks)
2. Explain the importance of regular cleaning of lighting fixtures in a commercial building. (5 marks)
3. Describe the steps to troubleshoot a faulty lighting circuit. (5 marks)
4. Explain the routine maintenance procedures for lighting systems. (5 marks)
5. Describe the safety protocols to follow when working with lighting circuits. (5 marks)

Section 3: Diagram Labeling

Label the following components in the diagram:

1. Switch
2. Socket
3. Fuse
4. Ballast
5. Lamp
6. Wiring
7. Circuit breaker
8. Grounding point
9. Neutral wire
10. Live wire

[Diagram of a lighting circuit]

Marking Guide

The assessment will be marked as follows:

- Multiple Choice questions: 1 mark per correct answer
- Short Answer questions: 5 marks per question, based on the following criteria:
  - Accuracy and completeness of answer (2 marks)
  - Clarity and coherence of writing (1 mark)
  - Use of relevant technical vocabulary (1 mark)
  - Adherence to safety protocols (1 mark)
- Diagram Labeling: 10 marks for correct labeling of components, with a penalty of 1 mark for each incorrect label

Implementation Guidelines

The assessment will be administered in a 45-minute class period.

Students will be provided with a copy of the assessment questions and a diagram of the lighting circuit.

The teacher will be responsible for:

- Distributing the assessment materials
- Explaining the instructions and any specific requirements
- Monitoring students during the assessment
- Collecting and marking the assessments

Differentiation Options

To cater to diverse learners, the following differentiation options will be available:

- For students with visual impairments: large print or braille versions of the assessment questions and diagram
- For students with learning difficulties: extra time to complete the assessment, use of a scribe or reader, or provision of a graphic organizer to support short answer questions
- For English language learners: provision of a bilingual dictionary or glossary of technical terms

Evidence Collection Methods

The assessment will provide evidence of students' knowledge and skills in the following areas:

- Understanding of the basic components of a lighting circuit
- Ability to identify common lighting circuit faults
- Knowledge of routine maintenance procedures for lighting systems

Feedback Opportunities

The assessment will provide opportunities for feedback in the following areas:

- Students will receive feedback on their understanding of the basic components of a lighting circuit and their ability to identify common lighting circuit faults
- Students will receive feedback on their knowledge of routine maintenance procedures for lighting systems
- The teacher will receive feedback on the effectiveness of the instruction and the need for additional support or review in specific areas

Conclusion

This assessment is designed to provide a comprehensive evaluation of students' knowledge and skills in Electrical Engineering, specifically in the area of Lighting Circuits and Maintenance.

The clear success criteria and evidence collection methods will ensure that students are well-prepared for future assessments and career opportunities in the field.