

**-SQA- SCOTTISH QUALIFICATIONS AUTHORITY**

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**NATIONAL CERTIFICATE MODULE DESCRIPTOR**

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**-Module Number- 4110210 -Session- 1990-91**  
**-Superclass- TH**

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**-Title- EMERGENCY LIGHTING AND BATTERY  
MAINTENANCE (x<sup>1</sup>/<sub>2</sub>)**

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**-DESCRIPTION-**

**Purpose** This module is designed to develop knowledge and comprehension of the operation and maintenance of the principal systems of emergency lighting and secondary batteries.

It is intended that this module is taught in conjunction with other related modules and forms part of a course of study which should include complementary industrial experience and is aimed at those following a career in electrical installation work.

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<b>Preferred Entry Level</b>	94106	Electrical Installation: Circuit Fundamentals.
	4110130	Work Safety.
	64120	Documentation for Electrical Installation (x 1/2).

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**Outcomes** The student should:

1. describe the types of systems used to provide emergency lighting of premises;
2. describe the installation and maintenance for secondary batteries;
3. interpret the current IEE Wiring Regulations and British Standards (BS) appropriate to emergency lighting and battery maintenance.

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**Assessment Procedures** Acceptable performance in the module will be satisfactory achievement of all the Performance Criteria specified for each Outcome.

Students should have access to the current edition of the IEE Wiring Regulations when carrying out the assessment of the Outcomes.

The following abbreviations are used below:

PC Performance Criteria  
IA Instrument of Assessment

**Note:** The Outcomes and PCs are mandatory and cannot be altered. The IA may be altered by arrangement with SQA. (Where a range of performance is indicated, this should be regarded as an extension of the PCs and is therefore mandatory.)

**OUTCOME 1 DESCRIBE THE TYPES OF SYSTEMS USED TO PROVIDE EMERGENCY LIGHTING OF PREMISES**

PCs

The description of the systems used for emergency lighting of premises is in accordance with BS terminology with respect to type and correct in terms of their limitations and advantages for given situations.

IA Restricted Response.

The student will be presented with an exercise consisting of restricted response questions to test the comprehension of the types of systems used to provide emergency lighting of premises and their limitations and advantages. The exercise will consist of 4 questions allocated as follows:

- |       |                             |   |
|-------|-----------------------------|---|
| (i)   | single point maintained     | 1 |
| (ii)  | single point non-maintained | 1 |
| (iii) | central battery             | 1 |
| (iv)  | standby generator           | 1 |

Satisfactory achievement of the Outcome will be based on all Performance Criteria being met. This will be demonstrated by the student producing 3 correct responses.

**OUTCOME 2 DESCRIBE THE INSTALLATION AND MAINTENANCE PROCEDURES FOR SECONDARY BATTERIES**

PCs

- The identification of secondary batteries is correct in terms of type and composition.
- The description of the safety measures required when installing equipment in battery rooms is correct in accordance with the relevant BS.

- (c) The description of the procedures for charging and maintaining batteries is in accordance with the manufacturer's instructions.

#### IA Structured Questions

The student will be presented with an exercise consisting of structured questions to test comprehension of the procedures for installing and maintaining secondary batteries.

The exercise will consist of 2 structured questions allocated as follows:

- (i) lead acid battery;
- (ii) alkaline battery.

The student should be provided with a sample of each of the above batteries. This could be actual batteries or pictorial representations.

Each question will be sub-divided as follows:

- (a) identification of type of battery;
- (b) installation safety measures;
- (c) maintenance procedures.

Satisfactory achievement of the Outcome will be based on all Performance Criteria being met. This will be demonstrated by the student producing a correct response to each part of the structured question for questions (i) and (ii).

### **OUTCOME 3      INTERPRET THE CURRENT IEE WIRING REGULATIONS AND BRITISH STANDARDS APPROPRIATE TO EMERGENCY LIGHTING AND BATTERY MAINTENANCE**

PCs      The interpretation of the current IEE Wiring Regulations and British Standards is correct in relation to emergency lighting and battery maintenance.

#### IA Objective Items

The student will be presented with an exercise consisting of objective items to test comprehension of the current IEE Wiring Regulations and appropriate BS applicable to emergency lighting and battery maintenance.

The exercise will consist of 12 questions constructed to test comprehension of the following:

(i) IEE Wiring Regulations:

351-1, 561-1, 561-2, 525-1, 525-2, 525-3, 525-4, 525-6, 525-7, 525-8, 525-9, 563-1, 563-2, 563-5.

(ii) BS 5266 Part I 1988:

Sections 2, 3, 6.7, 7, 8 and 11.

The questions will be allocated as follows:

(i) - 7

(ii) - 5

Objective items could be either multiple choice or short answer questions.

Satisfactory achievement of the Outcome will be based on the Performance Criterion being met. This will be demonstrated by the student producing 6 correct responses to (i) and 4 correct responses to (ii).

**The following sections of the descriptor are offered as guidance.  
They are not mandatory.**

### CONTENT/CONTEXT

Corresponding to Outcomes 1-3:

1. Types of system to include:

- (i) single point;
- (ii) central battery;
- (iii) stand-by generator.

(b) Emergency lighting luminaire to include:

- (i) sustained;
- (ii) maintained;
- (iii) non-maintained.

(c) Advantages and limitations of the aforementioned systems and luminaires.

Escape lighting, standby lighting, illumination values. Constructional features to include casings, diffusers, battery chargers, relays, battery packs. Duration times, charging indicators and charging times.

Premises requiring emergency lighting systems BS 5266: Part 1 1988.

2. Trickle charging of batteries. Methods of measuring state of charge. Methods of connecting batteries (series/parallel) to obtain a suitable output.

Alkaline/lead acid cells: voltage, current capacity and ampere-hour capacity.

Battery room installation: protective equipment, neutralising agents, clean and well-vented area, acid spillings, fire extinguishing equipment.

Dangers to include: acid burns, alkaline burns, naked lights, mixing of electrolyte, corrosion, short-circuiting of terminals, over-charging and under-charging.

Knowledge of the correct and safe use of tools and equipment.

3. Current IEE Wiring Regulations:

351-1, 525-1 to 525-9, 561-1, 561-2, 563-1, 563-2, 563-5.

Code of Practice British Standard (BS) 5266 Part 1:

Scope and relevant definitions. Consultation procedures and records. Range of emergency lighting systems. Marking of operating voltage on equipment. Acceptable wiring systems and circuit requirements. Servicing of batteries, routine inspection and testing. Provision of inspection and test certificate. Maintenance and routine testing supervision.

Health and Safety At Work Act 1974 and its statutory instruments:

Employer and employees responsibilities, safe working practices and in particular correct disposal of batteries.

SUGGESTED LEARNING AND TEACHING APPROACHES

Teaching will be mainly instructional, although open discussion could be encouraged to develop the Outcomes from previous modules.

The comprehensive use of BS and the current IEE Wiring Regulations in conjunction with manufacturers' literature should be encouraged to enable a working appreciation of the systems to be developed.

Where possible the use of practical demonstrations using commercial equipment or site visits to installations having extensive emergency services should be encouraged.

The Suggested Learning and Teaching Approaches could also include:

Films/videos	Outcomes 1,2
Slides	Outcomes 1,2
IEE Wiring Regulations	Outcomes 3
BS	Outcome 3
Manufacturers' Literature	Outcomes 1-3

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