

## Sample Practical Examination

This practical examination is divided into three parts:

1. Mounting system onto a demonstration wall and roof.
2. Wiring the system.
3. Testing and commissioning the system.

To successfully pass the examination participant must achieve a minimum score of 70%. The scoring is based on undertaking all the activities listed below.

### A3.1 Part A: Mounting of the Equipment

The system to be installed by the examination participants comprises:

- Two (2) of thirty-six (36) cell solar module suitable for 12 V system.
- One (1) array frame.
- One (1) 12V DC nominal input inverter.
- Two (2) 12V DC nominal sealed batteries.
- One (1) solar controller.
- One (1) DC rated switch two pole disconnecter (PV array isolator)
- Quantity four (4) DC rated fuses (main battery fuses) and associated fuse holders (preferably switch fuses if possible). Two fuses are to be located between the battery and controller. The second set of two fuses are to be mounted between the batteries and inverter. However, if inverter is small enough then possibly only one set of fuses will be required (sized to protect both the inverter cable and the solar cable), however separate isolation devices will be required for the inverter and the solar controller.
- One (1) DC light switch.
- One (1) DC light.
- Earth/ground clamp suitable for the selected array frame and an earth/ground rod.

The equipment is to be mounted onto the simulated wall and roof provided. When installing the array frame onto the simulated roof, the examination participant will seek the assistance of one other examination participant.

#### **Activities Assessed**

The mounting of the equipment requires the examination participant to;

1. Draw a schematic of where the individual components will be mounted on the simulated wall/roof.
2. Mount the two solar modules onto the array frame.
3. Prior to mounting the array structure on the simulated roof the examination participant, using the compass, points the array frame in the correct direction for that site. This will be assessed by the examination assessor before the examination participant continues to:
4. Mount the array frame onto the simulated roof (would possible need support from one other participant).
5. Mount the PV array switch disconnecter onto the simulated wall.
6. Mount the solar controller onto the simulated wall.
7. Mount the light and switch onto the simulated wall.
8. Place the two batteries onto the base of the wall structure.
9. Mount the inverter on the simulated wall or place it on the base of the wall structure.
10. Mount the battery fuses onto the simulated wall.

### A3.2 Part B: Wiring the System

### **Activities Assessed**

Assume the distance between the solar array and the solar controller in real life is 10 metres. The maximum voltage drop that is allowed between the array and controller is 3%.

Using the data sheets provided what is the  $I_{sc}$  of one solar module ? \_\_\_\_\_ A

What is the  $I_{sc}$  of the array that is being installed? \_\_\_\_\_ A

What is the DC system voltage? \_\_\_\_\_ V

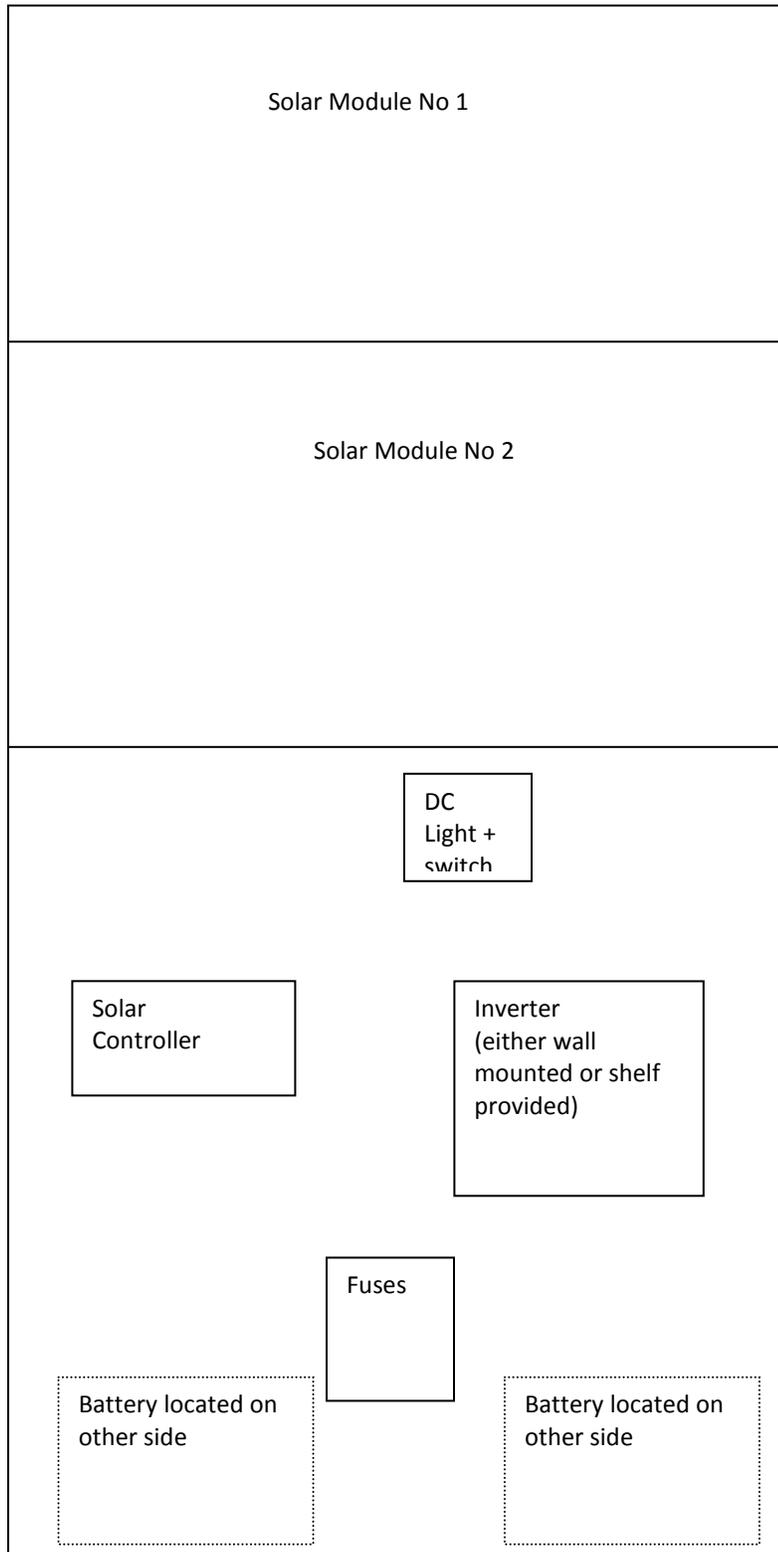
Using the Tables 1, 2 and 3 what is the minimum sized cable to meet the current carrying requirement and the voltage drop? \_\_\_\_\_ mm<sup>2</sup>

### A3.3 Part C: Test and Commission the System

#### **Activities Assessed**

Test and commission the system as per the testing and commissioning sheets provide. Complete the sheets and submit them to the examination assessor.

# Front view



**Side view**

**Simulated Roof  
Structure  
or Aluminium triangle  
for mounting the modules**

Light and  
Switches

Solar Controller  
behind it the  
Inverter  
(See front view)

F  
U  
S  
E  
r

Battery

