



Refrigeration/ Air- conditioning/ Ventilation Mechanic (Electrical Control) Trade Test Mock Practical Test Paper

此文件關於空調製冷設備技工（電力控制）中級工藝測試考題。如有需要索取此文件的中文版本，請致電 2100 9000 與香港建造業工藝測試中心聯絡。

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Test Paper for Intermediate Trade Test

Job Title : Refrigeration / Air-conditioning / Ventilation Mechanic (Electrical Control)

Skill Level : Medium-skilled worker

Test: Complete the following two electrical control practical tasks at the specified locations in the following sequence:

Task 1 Install a control circuit for a fan coil

Task 2 Install a control circuit for an air-handing unit

- ◆ This test has a total of 2 tasks and the full score is 100. To pass the practical test, candidates must achieve the passing marks for each task.

Time Limit : Three hours

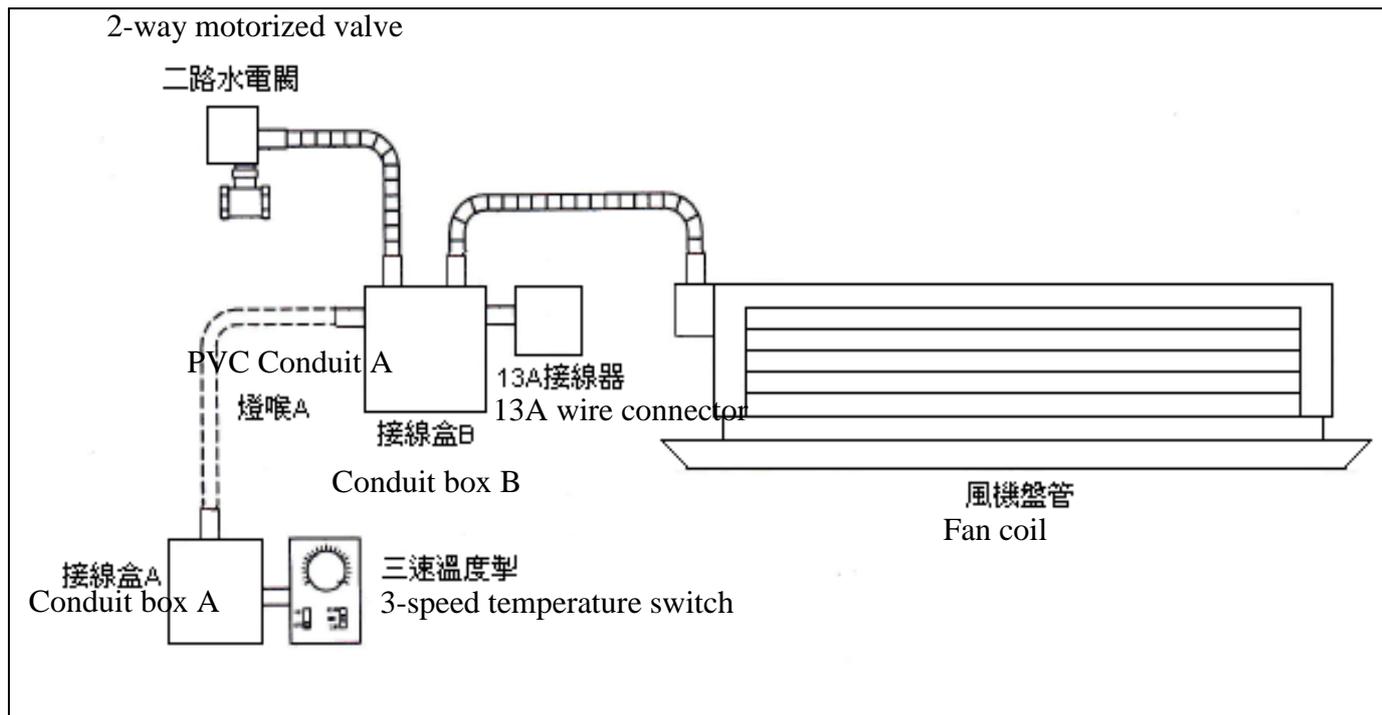
- Points to note : (1) Before you start, read all instructions for candidates below and test paper carefully. If you have any questions, ask an invigilator immediately.
- (2) You will fail the test if you do not take proper safety measures during the respective test; and
- (3) After the test, clean up the venue and restore its original condition as instructed by the invigilators.
- (4) The power plug is installed solely for examination purpose; Please note that all fixed electrical installations at the site must be performed by registered Electrical Workers.

Task 1 : Install a control circuit for a fan coil

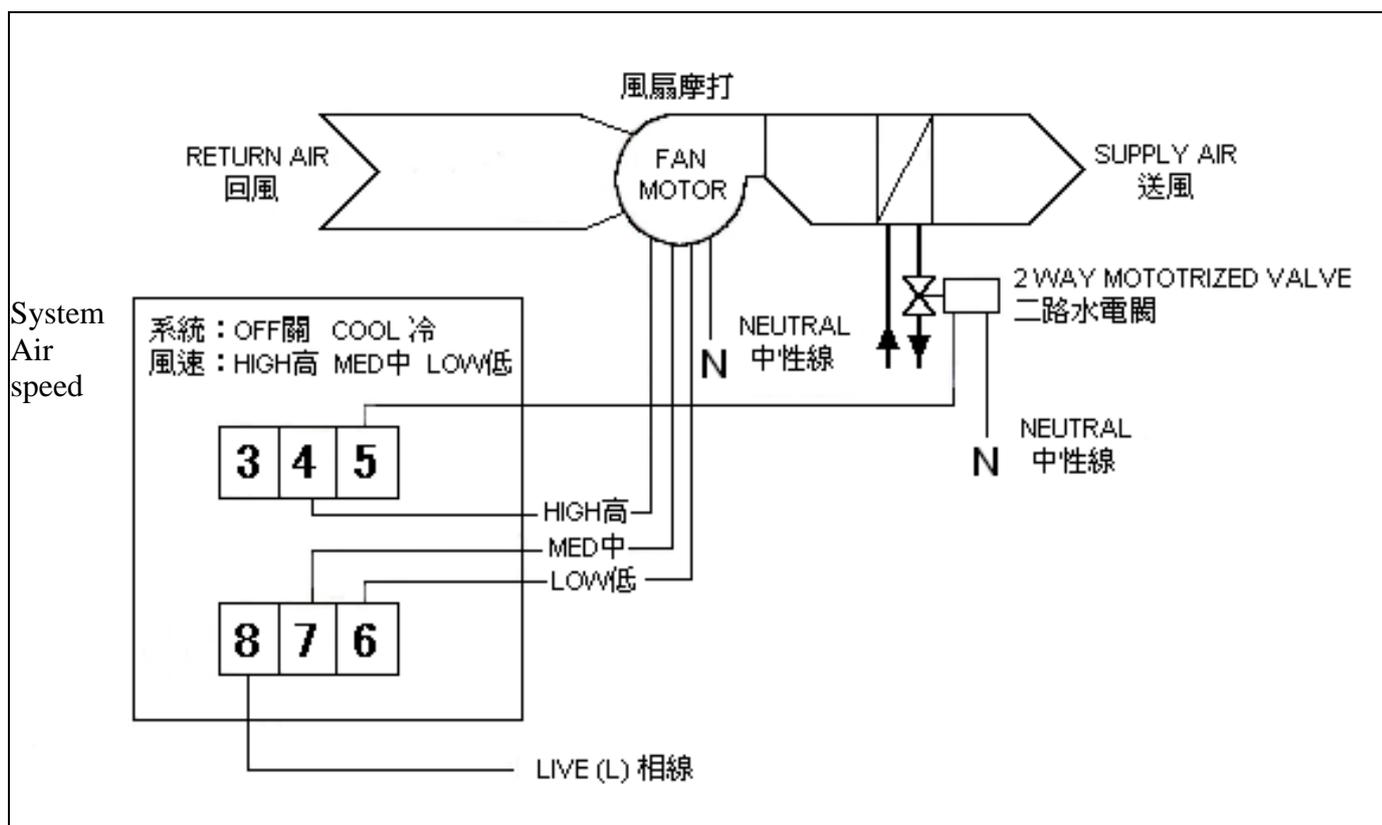
1. Prepare and install conduit A according to Fig. 1.
2. Connect the control circuit for fan coil, 3-speed temperature switch and 2-way motorized valve.
3. Connect system electricity and safety earth. **(To facilitate invigilators' inspection, do not close the covers of all conduit boxes.)**

The below tasks should only be performed after you have informed the invigilators for on-the-spot verification

4. Using the multi-meter, test whether the circuit is suitable for electrification, and fill in the test form.
5. Upon assessors' approval, electrify the circuit for operational test and fill in the form.



Installation drawing of power system for fan coil (Fig.1)



Electricity wiring diagram of 3-speed temperature control (Fig.2)

Task 2 : Install a control circuit for a air-handing unit

1. Connect the control circuit for air-handing unit according to Fig. 3 and Fig. 4, which include:

- a. Motor control circuit and electricity circuit;
- b. Heating wire and fan motor interlocking control circuit;
- c. Control circuit of circuit breaker to prevent overheating of heating wire;
- d. Circuit for ventilation/air conditioning (VAC) control;
- e. Control circuit for delayed fan (heating wire) shut down;
- f. All control circuits for electronic control components;

2. Adjust the motor overload protector setting.

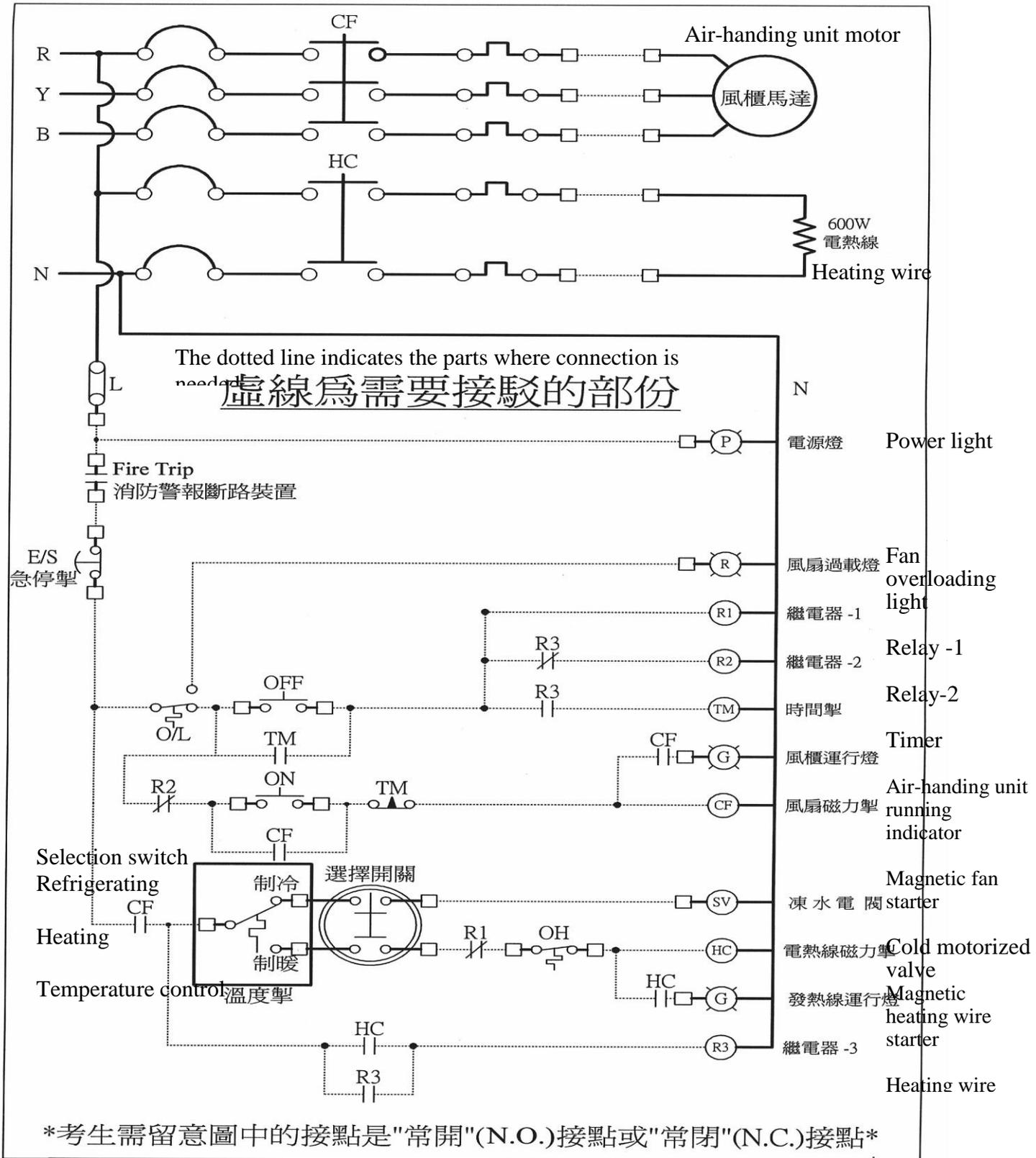
3. Close the covers of all conduit boxes properly.

The below tasks should only be performed after you have informed the invigilators for on-the-spot verification

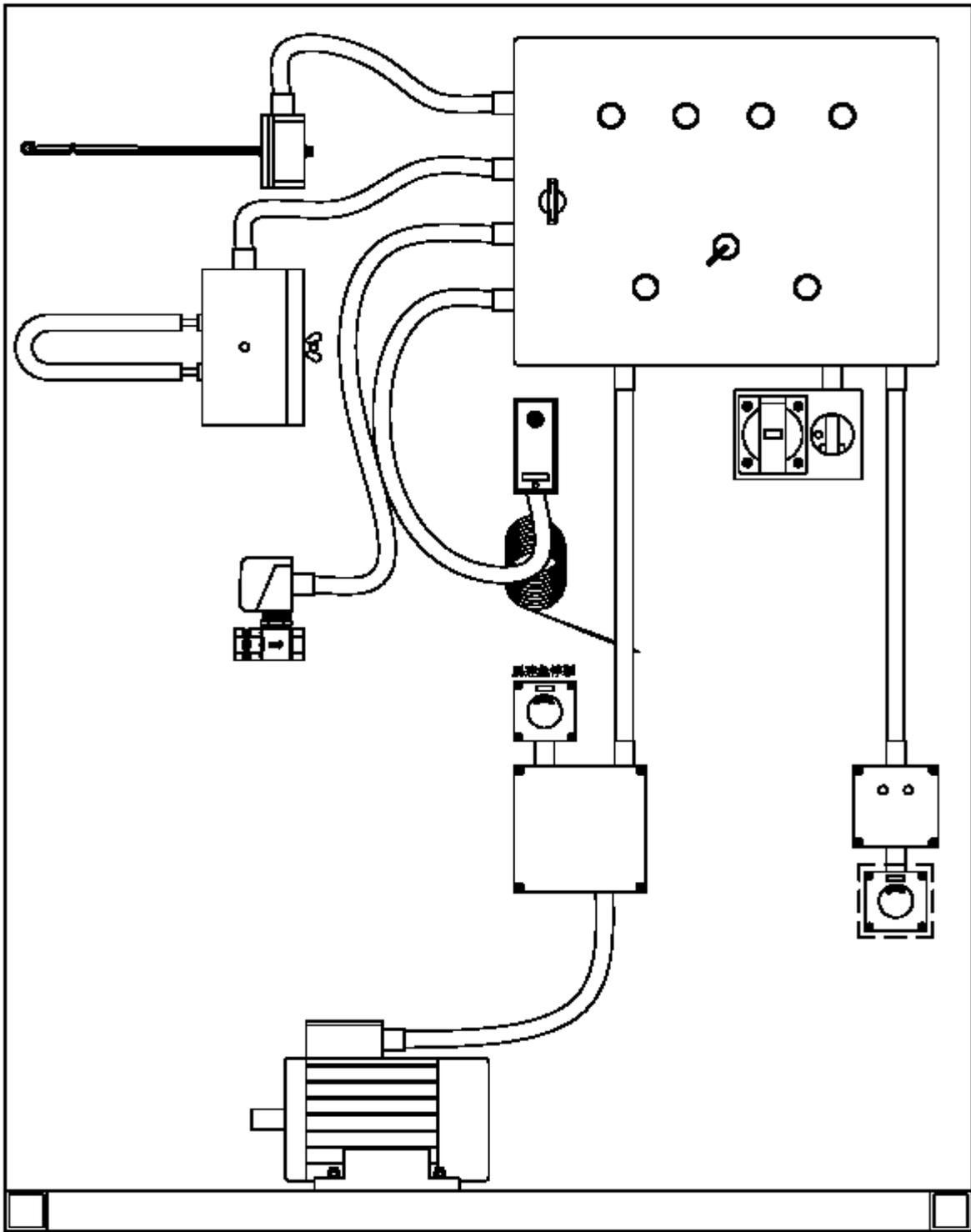
4. Upon completion, use the insulation meter and multi-meter to test whether the circuit is suitable for electrification, and fill in the test form.

5. Upon assessors' approval, electrify the circuit to perform operational test and fill in the form.

(Fig. 4) Installation drawing of control circuit for air-handling unit



Candidates should be aware of whether the contact points in the diagram are “Normally Open” (N.O.) or “Normally Closed” (N.C.) contact points



List of materials, equipment and tools

Item	Name	Quantity
	Materials	
1	Electrical cable, I/C, PVC insulated, brown, 1mm ²	As appropriate
2	Electrical cable, I/C, PVC insulated, blue, 1mm ²	As appropriate
3	Electrical cable, I/C, PVC insulated, brown, 2.5mm ²	As appropriate
4	Electrical cable, I/C, PVC insulated, blue, 2.5mm ²	As appropriate
5	Electrical cable, I/C, PVC insulated, yellow/green stripes, 2.5mm ²	As appropriate
6	20mm PVC conduit	As appropriate
	Equipment	
1	Control circuit set for fan coil	1 set
2	Control circuit set for air-handing unit	1 set
	Tools	
1	Threading belt or wire	1
2	Screwdriver (terminal)	1
3	Screwdriver, flathead	1
4	Screwdriver, crosshead	1
5	Combination plier, 150mm	1
6	Long-nose plier, 150mm	1
7	Plier, 150mm	1
8	Measuring tape, 3.6m	1
9	PVC conduit cutter	1
10	Multi-meter	1
11	Plier meter	1
12	Insulation meter	1

Note: After completing the test, candidates should return all borrowed tools as well as this test paper. Candidates may not leave until the invigilator's instructions.

Notes to Candidates :

1. Candidates should read the test papers carefully and ask the invigilator for any queries.
2. Candidates should study the drawings and specifications attached to test papers, if any, before the test begins.
3. Candidates should carry out the test according to test papers, working drawings and specifications provided.
4. Candidates shall bring their own safety shoes, other safety equipment will be provided by trade testing centre. Candidates must take all necessary safety precautions to ensure work safety.
5. All tools and materials required by the test will be provided by trade testing centre, candidates should check and ensure their adequacy and quality. Candidates shall use the tools and materials properly based on trade practice. All the tools must be returned to trade testing centre after the test. The candidates may ask the invigilator for any problems.
6. Candidates are required to handle and move the tools and materials for use in the test, and to carry out associated works.
7. Invigilator will take record photos periodically during the test.
8. Candidates are not allowed to take any photo or video with cameras or mobile phones.
9. Candidates are not allowed to use their mobile phones during the trade tests, except for emergency situation.
10. The marking scheme is based on the following criteria :
 - a) Understanding of drawing and specification
 - b) Preparation works before commencement of test
 - c) Working procedures
 - d) Accuracy and quality of works
 - e) Progress of works
 - f) Proper handling and use of materials
 - g) Proper use of tools and equipment
 - h) Safety precautions
 - i) Considerate of other trades
 - j) Housekeeping after completion of test
11. All candidates must stop when time is up.
12. Candidates are required to return the test paper to invigilator after the test.
13. Offering bribe to invigilator is an offence in law and trade testing centre will report to the ICAC for any such case.

In the event that the candidate fails to take any necessary safety precautions and / or works in any dangerous situations, he / she will be assessed failed