

higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

T440(E)(A5)T
AUGUST EXAMINATION

NATIONAL CERTIFICATE

**MULTI-DISCIPLINARY DRAWING OFFICE PRACTICE:
ELECTRICAL DRAUGHTING**

(8080625)

5 August 2015 (Y-Paper)
13:00–17:00

REQUIREMENTS: Computer-aided drawing software

Candidates need drawing instruments.

Calculators may be used.

This question paper consists of 6 pages and 1 diagram sheet.

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MULTI-DISCIPLINARY DRAWING OFFICE PRACTICE:
ELECTRICAL DRAUGHTING
TIME: 4 HOURS
MARKS: 100

INSTRUCTIONS AND INFORMATION

1. Answer ALL the questions (theory and drawings) on the DRAWING PAPER (NO separate ANSWER BOOK is required for answering any of the questions).
 2. Read ALL the questions carefully.
 3. Number the answers according to the numbering system used in this question paper.
 4. Marks will be allocated for:
 - 4.1 Balanced layout and size
 - 4.2 Correctness
 - 4.3 Lettering
 - 4.4 Line work and neatness
 5. Write your EXAMINATION NUMBER on each sheet of paper.
 6. Write neatly and legibly.
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- 1.3 You are involved in the calculation of the total required flux for a new drawing office.

The following data is available to you:

Recommended illuminance : 800 lumen/m²
Coefficient of utilisation : 0,54
Lamp lumen depreciation : 0,8
Maintenance factor : 0,8
Length of the room : 12 m
Width of the room : 7 m

$$\text{Total required flux: } \Phi = \frac{E_{av} \times A}{M \times CU \times LLD}$$

Use the given information and calculate the total required flux for the new office and also state the unit for the answer.

(5)

- 1.4 Complete the following sentences by filling in the missing word(s). Write only the word(s) next to the question number (1.4.1–1.4.3) on the DRAWING PAPER.

1.4.1 Connections from overhead lines to domestic installations shall be by means of ... cable

1.4.2 An overcurrent protective device in a motor circuit must have enough ... to allow the motor to start and to accelerate under normal conditions.

1.4.3 In a multi-phase installation, the circuits shall be so arranged that the total load is as nearly as practicable ... across the phases.

(3 x 1)

(3)

[20]

QUESTION 4: ELECTRICAL MOTORS AND CONTROL DEVICES

The FIGURE on the attached DIAGRAM SHEET, is a freehand drawing of the power (main) circuit and the control circuit of a direct-on-line three-phase motor starter.

Draw a neat, fully labelled diagram on the DRAWING PAPER of the given circuit.

Improve the circuit layout where possible. Improve and complete the item labelling and item designation in accordance with IEC publication 750.

With the exception of relevant circuit designation and labelling, it is not required on the drawing to connect the control circuit to the main (power) circuit.

[20]

QUESTION 5: WIRING OF PREMISES

Draw a plan elevation of a domestic installation and make provision for the following:

- Combined area for dining/lounge/living room (TV room)
- Kitchen area
- Passage
- THREE bedrooms
- Bathroom and toilet (separate rooms)
- Single garage separated from the house and with a sub-distribution board

A detailed drawing of the building is NOT required.

Add ALL electrical points necessary for this type of dwelling on the plan, taking into account ALL applicable regulations in the SANS 10142 national code of conduct for the wiring of premises. A decision was already taken to install the main distribution board in the kitchen area and it must be incorporated as such on the drawing.

The drawing must be accompanied by a legend (key) of the electrical installation symbols.

[20]

TOTAL: 100

DIAGRAM SHEET

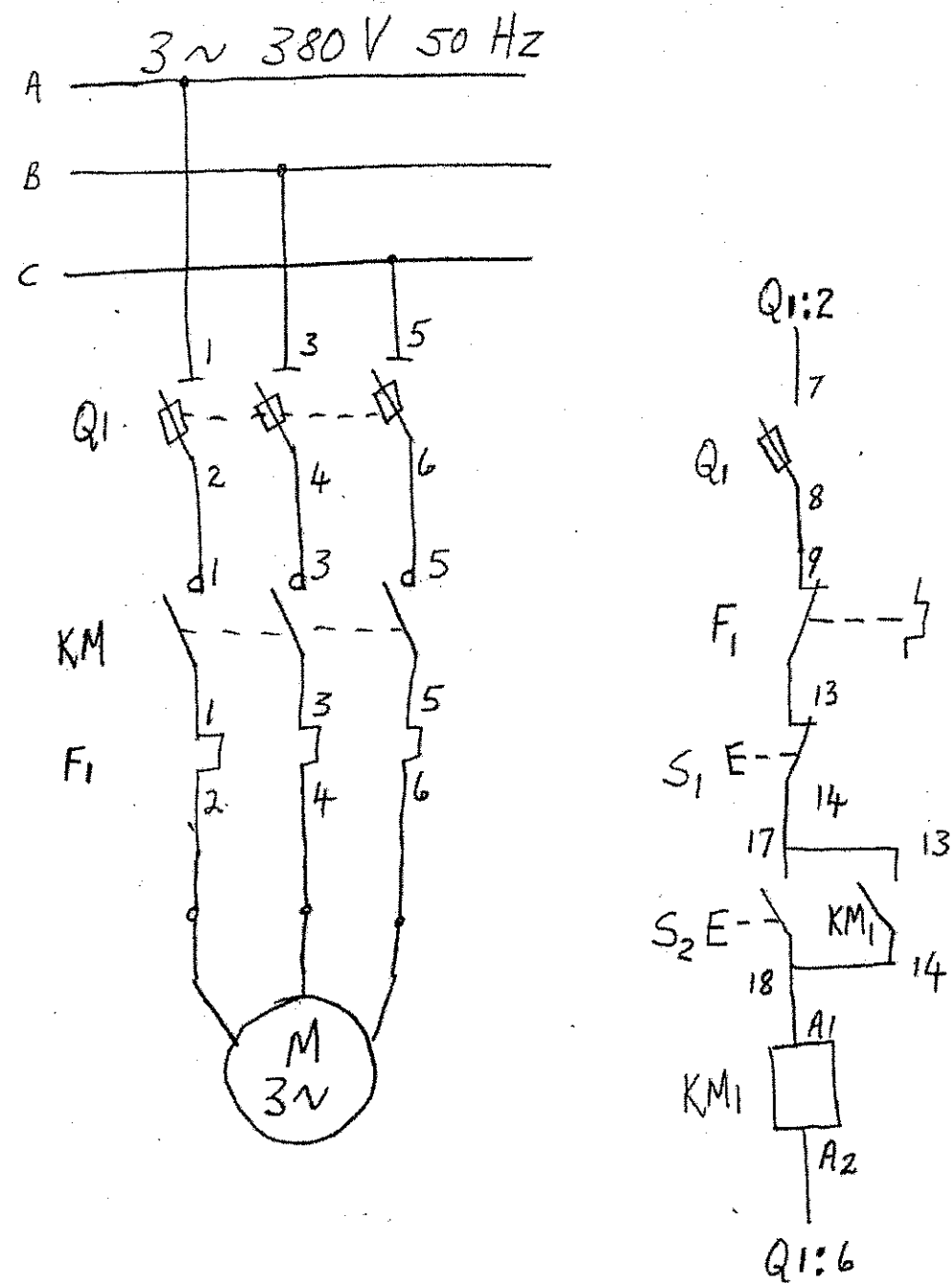


FIGURE: DIRECT-ON-LINE MOTOR STARTER (FREEHAND DRAWING)