

2394-302 Level 3 Principles, Practices and Legislation for the Initial Verification of Electrical Installations.

Chief Examiner's report – **June 2015**



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1 Introduction

The purpose of this document is to provide centres with feedback on the performance of candidates in the **June 2015** examination for 2394-302 Principles, Practices and Legislation for the Initial Verification of Electrical Installations.

The Chief Examiner's Report has been reintroduced as a result of feedback from centres, to give them guidance in preparing candidates for the written examination.

2 Feedback on candidate performance

General feedback

The following comments are intended to help students prepare for the examination by having a better understanding of what is expected of them. The feedback within this report would also be valuable to tutors in understanding candidates' difficulties in answering questions and the areas where more guidance is required.

The June 2015 question paper was found to be in accordance with the scheme requirements.

Candidates appeared to have no issues with the format of the paper. They need to be aware that the space left for their answer is intended to be generous and, in almost all cases, is more than enough to record their answer.

Candidates and centres should be mindful that this qualification relates to the initial verification of electrical installations. It was evident from answers provided by some candidates that they confused this process with that required during periodic inspection and testing.

Candidates should keep their responses within the allotted area and any additional sheets should be **stapled to the back** of the answer book. The number of additional attached sheets needs to be recorded in the box on the front cover of the examination paper/candidate response book. These additional sheets should be plain lined paper and not a second answer book. The blank pages at the back of the answer book should **not** be used for candidate responses. These pages are not allocated areas for recording answers. Where it becomes necessary for centres to copy/print additional answer books these should be produced double sided to facilitate correct scanning into the marking software.

The answers produced by candidates for this examination series were of a good standard but a significant number did not read the questions carefully.

When asked to list the required steps to complete safe isolation at the origin of a three-phase installation, a small but significant number of answers indicated dangerous procedures. Some answers did not include locking off, others involved using a voltage indicator which had not been checked for correct operation before, and after, confirming the isolation. Information that was most common omitted was retaining the key after locking off and the posting of a suitable sign at the locking point. This procedure is fundamental to safety when working on electrical installations and gives cause for concern that some candidates do not know how to carry out this procedure correctly.

It is important for the candidate to read the questions carefully. On a number of occasions it appeared that some candidates only read part of the question. It also appeared that some answers related to similar questions asked on previous papers rather than the question being asked on this paper.

Terminology

The use of "live" rather than "line" continues to cost some candidates marks. Candidates interchange the two terms when describing test procedures which often results in a loss of marks due to the testing procedure being unclear. Not all candidates use the correct titles for tests and test instruments. The terminology used in BS 7671 and Guidance Note 3 must be used when answering questions.

Knowledge of BS 7671 and Guidance Note 3

One question required the candidates to list the three documents that must be completed and handed to the client on completion of an initial verification of an installation. A small number of candidates were unable to correctly identify the three documents. Incorrect responses included "Schedule of tests" and "Installation report".

When asked where information relating to the use of new materials which do not meet a national or international standard, but are in accordance with the designer's intent, should be recorded, very few candidates gave the correct answer. Some answers incorrectly related to periodic inspection documentation.

Candidates were asked to state the criteria that must be met to allow a Minor Electrical Installation Works Certificate to be issued. A small number of incorrect answers stated that it was appropriate to use this document when a new circuit had been installed.

Inspection

One question asked the candidate to explain why inspection needs to be carried out during the erection stage of an installation. Some answers related to why inspection is required rather than why inspection is required **during the erection stage**. Candidates failed to recognise that cables run within the fabric of the building cannot be inspected after the work is complete.

Most candidates provided good answers when asked to identify five checks to be made during an inspection of the **termination** of the cables and conductors **within** a fused connection unit. A number of candidates incorrectly gave information relating to the fixing of the fused connection unit back box, the fixing of the cables, the fused connection unit complying with the appropriate British Standard, checking that the correct fuse size had been fitted and checking the condition of the wall mounted heater. All of these are items that need to be inspected, but do not relate to the termination of the conductors and cables. Some candidates were looking for signs of overheating and arcing within the unit which had not yet been energised. A few answers related to the termination of a socket-outlet rather than a fused connection unit. Some answers were vague such as "cable terminated correctly". Yes the cable must be terminated correctly, but what makes a "correct termination"? Good answers included comments such as "cable terminations are tight", "no copper showing at the termination" and "thermoplastic twin and cpc cable connected to "supply" terminals".

Testing

When asked to list, in the correct sequence, the five instrument tests to be carried out on a radial socket-outlet circuit, a large number of responses contained errors. Most candidates were able to state that the first test to be undertaken was continuity of protective conductors. Many incorrect answers then went on to state either "continuity of live conductors", an " $R_1 + R_2$ " test or "continuity of ring final circuit conductors". A small number of answers placed a

polarity test before an insulation resistance test. A few answers gave no tests at all, but recorded the test instruments instead, and scored no marks.

Another question related to an earth fault loop impedance test being carried out at the terminals of a local isolator/starter positioned 5 metres from a three-phase motor. The first part of the question asked about the preparation required before carrying out the test: What instrument would be used, the checks to be made on the instrument and if the Main Protective Bonding Conductors are to be connected or disconnected during the test. Generally this part of the question was well answered, although a small number of answers given by candidates did not use the correct instrument title and some candidates, incorrectly, intended to disconnect the Main Protective Bonding Conductors. Disconnecting these conductors during this live test could result in a dangerous condition developing on the system.

The second part of the question required the candidate to describe, in detail, how the test would be carried out. Many answers did not state where on the circuit this would be undertaken, while other answers did not include testing each line conductor to earth. Some answers incorrectly described a prospective fault current test. Marks were also lost because candidates used the term "live" instead of "line" in their descriptions. Candidates were not penalised for repeating the information given in the first part of the question when describing the test procedure even though the question did state that this was not necessary. This did take up the candidate's time, and sometimes made it difficult for the candidate to complete the answer in the space provided.

The third part of the question required the candidate to state what must be done to determine the total earth fault loop impedance for the circuit. Many candidates failed to realise that 5 metres of the circuit had not been included in the live test and this cable resistance needed to be added to the test result.

Candidates were informed that a test to confirm the continuity of the protective conductors of a three-phase warm air fan circuit was to be carried out to determine the $R_1 + R_2$ value of the circuit. The first part of the question asked about the preparation required before carrying out the test. Generally, the answers given were correct.

The second part of the question required the candidate to describe, in detail, how the test would be carried out. A significant number of answers described the use of a "long lead" and would have been a perfectly acceptable answer if their description had included a measurement of the line conductor, a measurement of the cpc and stated that the two values were to be added together. Unfortunately, candidates only measured the resistance of the cpc, which resulted in no marks. Some candidates, who chose to use a "test link", failed to include tests on all three line conductors and cpc. Once again some candidates unnecessarily repeated the information they had given in response to the first part of the question.

The final question related to ring final circuit continuity testing. Part a) of the question required the candidate to determine, by calculation, the expected test results when carrying out the three steps of the test. Most candidates calculated the values correctly and included the correct units. A significant number of answers were incorrect. The most common errors were doubling the length of the cable, using a temperature correction factor (1.2) and not dividing by four when calculating the expected reading at each socket-outlet during steps two and three. A small number of candidates offered no answers to this part of the question.

Part b) asked the candidate to state the test results that would be recorded on the documentation on successful completion of a ring final circuit continuity test. Many candidates incorrectly stated R_1 , R_n and R_2 instead of r_1 , r_n and r_2 . Very few answers included the recording of correct polarity.

3 National pass rate

The national pass rate for the 2394-302 **June 2015** examination is as follows:

Exam series	Pass rate (%)	Fail rate (%)
June 2015	58	42

Past examination series

Exam series	Pass rate (%)	Fail rate (%)
April 2015	63	37
February 2015	64	36
December 2014	41	59

Forthcoming Exam Dates are:

Tues 11 August 2015 18:30 – 20:30
Tues 13 October 2015 18:30 – 20:30
Tues 01 December 2015 18:30 – 20:30

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