

Initial and Periodic Inspection and Testing of Electrical Installations (2391-052)

Sample Test

Version 1.5 – June 2022

| Version and date | Change detail | Section |
|--------------------------|--|---------|
| 1.3 July 2018 | <ul style="list-style-type: none"> Modified questions/answers to suit BS 7671:2018 | All |
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| 1.5 June 2022 | <ul style="list-style-type: none"> Modified questions/answers to suit BS 7671:2018 (2022)A2 | All |

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|------------------|------|-------------|----------|
| Candidate | Name | Date | DD/MM/YY |
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1 What needs to be verified during the inspection of a new installation?

- a) Electrical equipment has not degraded.
- b) Fixed installation is correctly selected.
- c) Fixed installation has not deteriorated.
- d) Electrical appliances comply with BS 7671.

Response: _____

2 What process involves checking if an installation has deteriorated?

- a) Initial Verification.
- b) Condition Inspection.
- c) Initial Inspection and Testing.
- d) Periodic Inspection and Testing.

Response: _____

3 What document **must** be issued following the installation of a new cooker circuit to an existing installation?

- a) Electrical Installation Report.
- b) Electrical Installation Certificate.
- c) Electrical Installation Condition Report.
- d) Minor Electrical Installation Works Certificate.

Response: _____

4 What circumstance would require an Electrical Installation Condition Report to be issued?

- a) New luminaires have been installed.
- b) Supermarket has been rewired.
- c) New occupier moving into a flat.
- d) Remedial work has been carried out.

Response: _____

5 Questions 5 to 11 relate to the following scenario.

Refurbishment of a leisure centre with a swimming pool is taking place. An additional lighting circuit is to be installed. The new lights will be at a height of 2.4 m above the pool.

What document **must** be completed following inspection and testing?

- a) Electrical Installation Certificate.
- b) Schedule of Electrical Condition.
- c) Electrical Installation Condition Report.
- d) Minor Electrical Installation Works Certificate.

Response: _____

6 Which non-statutory document directly relates to the process of inspection and testing?

- a) EWR
- b) GN3
- c) GS38
- d) ESQCR

Response: _____

7 What document **must** the Inspector use to record the new lighting circuit polarity?

- a) Schedule of Test Results.
- b) Schedule of Inspections.
- c) Electrical Installation Schedule.
- d) Electrical Installation Certificate.

Response: _____

8 What would be the **most** appropriate human sense to use when inspecting the IP rating of the new lights?

- a) Sight.
- b) Smell.
- c) Touch.
- d) Hearing.

Response: _____

9 What is the **minimum** IP rating required for the new lights?

- a) IPX8
- b) IPX5

- c) IPX4
- d) IPX2

Response: _____

10 What would be the **most** appropriate action to take if the new lights do not comply with the minimum IP rating?

- a) Notify the client without delay.
- b) Rectify the issue and re-inspect.
- c) Record on the Schedule of Inspections.
- d) Record on the Electrical Installation Certificate.

Response: _____

11 Which test **must** be carried out before earth fault loop impedance to ensure the installation is safe to energise?

- a) Voltage drop.
- b) Supply polarity.
- c) Residual current device.
- d) Prospective fault current.

Response: _____

12 Questions 12 to 16 relate to the following scenario.

The existing installation in a hotel is to be inspected and tested as a requirement of the local authority for a public entertainment licence application.

Previous inspection and testing records exist but two additional socket-outlet circuits have previously been installed for which there are no test results available.

Where **must** the Extent and Limitations of inspection and testing be recorded?

- a) Electrical Installation Certificate.
- b) Generic Schedule of Test Results.
- c) Electrical Installation Condition Report.
- d) Periodic Inspection Report Certificate.

Response: _____

13 Who will be involved in setting the sampling size for this installation?

- a) Inspector, Client and HSE.
- b) Client, Local Authority and HSE.
- c) HSE, Inspector and Local Authority.
- d) Inspector, Client and Local Authority.

Response: _____

14 What action should be taken with regard to the additional socket-outlet circuits?

- a) Both should be sampled to check compliance with BS 7671.
- b) One should be sampled to check compliance with BS 7671.
- c) Both should be fully tested to check compliance with BS 7671.
- d) One should be fully inspected to check compliance with BS 7671.

Response: _____

15 Which test can be carried out without the use of GS38 compliant test leads?

- a) Residual current device.
- b) Prospective fault current.
- c) Earth fault loop impedance.
- d) Continuity of protective conductors.

Response: _____

16 Which test may be unnecessary on any existing ring-final circuits, for which previous test records are available?

- a) Insulation resistance.
- b) Socket-outlet polarity.
- c) Ring-final circuit continuity.
- d) Earth fault loop impedance.

Response: _____

17 Questions 17 to 23 relate to the following scenario.

The continuity of a main protective bonding conductor to a gas installation pipe in a new primary school is to be tested. The 10 mm² conductor is 43 m long.

The installation has been safely isolated for this test.

What is the purpose of carrying out this test?

- a) To confirm electrical separation has been met.
- b) To confirm a requirement of ADS has been met.
- c) To confirm exposed conductive parts are earthed.
- d) To confirm extraneous conductive parts are present.

Response: _____

18 What instrument is to be used to carry out this test?

- a) Low resistance ohmmeter.
- b) Insulation resistance tester.
- c) Approved voltage indicator.
- d) Prospective fault current tester.

Response: _____

19 Why **must** the installation remain safely isolated whilst this test is carried out?

- a) To include parallel paths.
- b) To remove parallel paths.
- c) To ensure accurate test results.
- d) To remove the risk of electric shock.

Response: _____

20 Which additional piece of test equipment will be required for this test?

- a) Proving unit.
- b) Rotating disc.
- c) Wander lead.
- d) Earth electrode.

Response: _____

21 What is the **only** outcome that can be recorded on the Schedule of Inspections for this conductor?

- a) Lim
- b) N/V
- c) N/A
- d) Tick

Response: _____

22 What is the expected measured conductor resistance value?

- a) 0.00 Ω
- b) 0.05 Ω
- c) 0.08 Ω
- d) 0.12 Ω

Response: _____

23 Which risk to other persons **must** be managed when correctly undertaking this test?

- a) Burns risk.
- b) Trip hazard.
- c) Sharp edges.
- d) Electric shock.

Response: _____

24 Questions 24 to 28 relate to the following scenario.

The Voltage drop of a single-phase circuit supplying a bread oven is to be verified as part of periodic inspection and testing within a bakery. The circuit is wired in multicore 70 °C thermoplastic cable.

The circuit has a measured R_1+R_n value of 0.40 Ω and an I_b of 29.6 A.

The circuit protective device has an I_n of 32 A.

The installation forms part of a public 400/230 V TN-S system.

What is the purpose of this test?

- a) To confirm the oven will not overload the circuit.
- b) To confirm the protective device will operate correctly.
- c) To confirm the function of the oven will not be impaired.
- d) To confirm the cable will stay within temperature parameters.

Response: _____

25 What instrument is used for part of this process?

- a) PFC Tester.
- b) Multi-meter.
- c) Low resistance ohmmeter.
- d) Approved voltage indicator.

Response: _____

26 What is the **maximum** percentage voltage drop allowed for this circuit?

- a) 3 %
- b) 5 %
- c) 6 %
- d) 8 %

Response: _____

27 What is the calculated value of voltage drop?

- a) 11.8 V
- b) 13.5 V
- c) 14.2 V
- d) 14.8 V

Response: _____

28 What is the **most** appropriate outcome based on the value of voltage drop?

- a) Lim
- b) C1
- c) C2
- d) C3

Response: _____

29 Questions 29 to 33 relate to the following scenario.

The supply polarity of a restaurant is to be tested as part of a periodic inspection and test.

The supply and installation form part of a 230 V single-phase TN-S system.

Fault protection is provided by single-pole circuit breakers to BS EN 60898.

What would be the effect of reversed Line-Neutral supply polarity?

- a) Motors will spin in reverse direction.
- b) Equipment will not function correctly.
- c) Single-pole switches will not control the load.
- d) Circuit breakers will not disconnect an earth fault.

Response: _____

30 What instrument is used to carry out this test?

- a) Approved voltage indicator.
- b) Phase rotation test instrument.
- c) Low resistance ohmmeter.
- d) Insulation resistance tester.

Response: _____

31 What instrument safety check **must** be made before carrying out this test?

- a) Check battery level.
- b) Check compliance with GS38.
- c) Check operation on a proving unit.
- d) Check instrument within calibration.

Response: _____

32 What voltages are to be expected if the polarity is correct?

- a) L-N 230 V, L-E 230 V, N-E Zero V
- b) L-N Zero V, L-E Zero V, N-E 230 V
- c) L-N 230 V, L-E Zero V, N-E Zero V
- d) L-N Zero V, L-E 230 V, N-E 230 V

Response: _____

33 Why may the testing of circuit polarity be unnecessary?

- a) No changes have been made.
- b) Additions have been installed.
- c) High Z_s value has been recorded.
- d) Alterations have been carried out.

Response: _____

34 Questions 34 to 39 relate to the following scenario.

Periodic inspection and testing of a mobile catering unit is to be carried out as a requirement of the client's insurer.

The supply is from a 3 kVA 230 V single-phase portable generator and is connected as a TN-S system with earth fault protection provided by a BS EN 61008 30 mA RCD.

The catering unit is permanently sited and infrequently moved.

What would this information help the inspector to determine?

- a) The condition of the cables.
- b) The amount of sampling required.
- c) The number of RCD tests required.
- d) The number of circuits to be tested.

Response: _____

35 What needs to be verified with regard to the mobile catering consumer unit?

- a) The RCD main switch is rated at ≥ 63 A.
- d) The enclosure is made of polycarbonate.
- c) The top horizontal surface complies with IP4X.
- d) The bottom horizontal surface complies with IP4X.

Response: _____

36 What is the **maximum** test current applied to the RCD to confirm that fault protection is provided?

- a) 15 mA
- b) 30 mA
- c) 60 mA
- d) 300 mA

Response: _____

37 What is the **maximum** operating time of the RCD, when tested using a test current equal to the residual current rating?

- a) 40 ms
- b) 150 ms
- c) 200 ms
- d) 300 ms

Response: _____

38 The RCD is found to not operate at any test current.

What is the **most** appropriate classification code to record?

- a) C1
- b) C2
- c) C3
- d) FI

Response: _____

39 What additional action **must** the inspector take regarding this observation?

- a) Inform the client in writing without delay.
- b) Inform the insurer in writing without delay.
- c) Remove the portable generator until fault fixed.
- d) Isolate the installation and prevent re-energising.

Response: _____

40 Questions 40 to 46 relate to the following scenario.

Insulation resistance has been tested on five new lighting circuits in an existing large distribution warehouse. These circuits are supplied from a new single-phase, five-way DB.

Switching for each circuit is by 230 V contactors. Connection to each light is made using a BS 1363 socket-outlet adjacent to the fitting.

The supply and installation form a 400 V three-phase TN-C-S system.

What is the **correct** way to prepare one of these circuits for testing?

- a) Switch on lights, connect cpc, un-plug lights.
- b) Switch on lights, disconnect cpc, plug-in lights.
- c) Bypass contactors, connect cpc, un-plug lights.
- d) Bypass contactors, disconnect cpc, plug-in lights.

Response: _____

41 What affects the insulation resistance of each circuit tested?

- a) The csa and number of conductors.
- b) The csa and purpose of conductors.

- c) The number and length of conductors.
- d) The number and the purpose of conductors.

Response: _____

42 What is the **legal** status of the inspector?

- a) Skilled.
- b) Ordinary.
- c) Instructed.
- d) Competent.

Response: _____

43 What condition can be detected during the insulation resistance test?

- a) Damage to cable insulation.
- b) De-rating of cable insulation.
- c) Degradation of cable insulation.
- d) Deterioration of cable insulation.

Response: _____

44 The following test results were recorded.

What is the value of insulation resistance between Live and Earth for the new DB with all the lighting circuits connected?

| Circuit | Live-Live MΩ | Live-Earth MΩ |
|----------------|---------------------|----------------------|
| Lights 1 | 190 | 176 |
| Lights 2 | 187 | 20 |
| Lights 3 | 157 | 162 |
| Lights 4 | 122 | 134 |
| Lights 5 | 172 | 178 |

Figure 1

- a) 13 MΩ
- b) 20 MΩ
- c) 134 MΩ
- d) 178 MΩ

Response: _____

45 What is the test voltage applied during the insulation resistance test?

- a) 250 V AC
- b) 500 V AC
- c) 250 V DC
- d) 500 V DC

Response: _____

46 What would be the **most** appropriate action to take if the result for lighting circuit 1 is 0.95 MΩ between live conductors?

- a) Investigate lighting circuit 1 between Line-Neutral.
- b) Investigate lighting circuit 1 between Line-Earth.
- c) Record the result as a non-compliance.
- d) Record the result as acceptable.

Response: _____

47 Questions 47 to 49 relate to the following scenario.

A section of galvanised trunking is to be inspected as part of periodic inspection and testing of a factory. The trunking contains unsheathed low voltage cables.

What is the **minimum** IP rating for the bottom horizontal surface of the trunking?

- a) IPXXB
- b) IPX4
- c) IPXXD
- d) IP2X

Response: _____

48 Which are the **most** appropriate human senses to check the **security** of the trunking lid?

- a) Sight and smell.
- b) Touch and sight.
- c) Smell and hearing.
- d) Hearing and touch.

Response: _____

49 What is the **most** likely reason for carrying out this periodic inspection?

- a) New trunking has been installed.
- b) New contractors have been appointed.
- c) New occupiers have purchased the building.
- d) New cables have been installed in the trunking.

Response: _____

50 Questions 50 to 57 relate to the following scenario.

Continuity of a ring final circuit has been tested as part of an initial verification of a new primary school. All the socket-outlets are connected directly to the ring.

The circuit loop length is 58 m long, wired in 4 mm² live and 1.5 mm² cpc flat profile cable. The circuit is protected by a 32 A BS EN 60898 Type B circuit breaker.

Which test would detect incorrect polarity of the Live conductors at each socket-outlet?

- a) Line-Neutral at each socket-outlet.
- b) Line-Earth at the distribution board.
- c) Line-Neutral at the distribution board.
- d) Line-Earth at each socket-outlet.

Response: _____

51 What is the expected measured r_1 value?

- a) 0.27 Ω
- b) 0.32 Ω
- c) 0.43 Ω
- d) 0.52 Ω

Response: _____

52 What is the expected measured r_2 value?

- a) 0.27 Ω
- b) 0.45 Ω
- c) 0.70 Ω
- d) 0.84 Ω

Response: _____

53 What pattern of test results is expected at each socket-outlet when the line and neutral conductors are correctly cross-connected?

- a) Readings increase around the ring.
- b) Readings are substantially the same.
- c) Readings decrease around the ring.
- d) Readings rise to the centre and then fall.

Response: _____

54 What is the expected **maximum** measured value of R_1+R_n for this circuit when the line and neutral conductors are correctly cross connected?

- a) 0.13 Ω
- b) 0.16 Ω
- c) 0.22 Ω
- d) 0.49 Ω

Response: _____

55 What is a simplified way to verify the r_1 and r_2 ratio for this circuit?

- a) $r_1 = r_2 \times 1.67$
- b) $r_2 = r_1 \times 1.67$
- c) $r_1 = r_2 \times 2.67$
- d) $r_2 = r_1 \times 2.67$

Response: _____

56 Which document would be used to record the values obtained during these tests?

- a) EIC
- b) EICR
- c) SoTR
- d) SoCD

Response: _____

57 The installation has a measured Z_e of 0.29Ω .

What is the expected value of Z_s for this circuit?

- a) 0.24Ω
- b) 0.28Ω
- c) 0.53Ω
- d) 0.58Ω

Response: _____

58 The measured R_1+R_2 value for a radial cooker circuit, with a 6 mm^2 line conductor and a 2.5 mm^2 cpc, is 0.29Ω .

What is the length of this circuit?

- a) 23 m
- b) 28 m
- c) 33 m
- d) 38 m

Response: _____

59 Questions 59 and 60 relate to the following scenario.

An earth electrode resistance test has been carried out within a caravan park.

The supply and installation form a 230 V single-phase TT system. The following results were obtained, as shown in Figure 1.

| Test | Reading Ω |
|--------|------------------|
| Test 1 | 179 |
| Test 2 | 172 |
| Test 3 | 168 |

Figure 1

What value is to be recorded as the earth electrode resistance?

- a) 168Ω
- b) 173Ω
- c) 179Ω
- d) 200Ω

Response: _____

60 What is the **maximum** rating of RCD that can be used for **fault** protection on this installation?

- a) 30 mA
- b) 100 mA
- c) 300 mA
- d) 500 mA

Response: _____

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