
Sample test 1

The sample test below has 60 questions, the same number as the online exam, and its structure follows that of the online exam. The test appears first without answers, so you can use it as a mock exam. It is then repeated with worked-through answers and extracts from the *IEE Wiring Regulations*. Finally, there is an answer key for easy reference.

Answer the questions by filling in the circle next to your chosen option.

Section 1

1 BS 7671 applies to

- a equipment on board ships
- b lightning protection of buildings
- c lift installations
- d prefabricated buildings.

2 BS 7671 provides requirements for safety against the risk of

- a electric shock on an aircraft
- b shock currents on board ships
- c fire on offshore installations
- d shock currents in electrical installations.

3 Which one of the following is **not** a statutory regulation?

- a Electricity at Work Regulations 1989 as amended
- b The Supply of Machinery (Safety) Regulations 1992 as amended
- c Requirements for Electrical Installations (BS 7671)
- d Agricultural (Stationary Machinery) Regulations

4 BS 7671 identifies that the cross-sectional area of a conductor shall be determined by

- a the admissible maximum temperature
 - b the nominal voltage
 - c voltage tolerances
 - d the earthing system.
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Section 2

Notes

5 A corridor containing supporting structures for cables and joints and/or other elements of wiring systems, the dimensions of which allow persons to pass freely throughout the entire length, is known as

- a an access pathway
- b a cable tunnel
- c an access throughway
- d cable ducting.

6 The algebraic sum of the currents in the live conductors of a circuit at a point in the electrical installation is known as the

- a residual current
- b harmonic current
- c line current
- d neutral current.

7 An assembly of PV arrays is defined as a

- a PV cell
- b PV array cable
- c PV generator
- d PV a.c. module.

Section 3

8 With reference to the nature of the supply, which one of the following can be determined by calculation, enquiry or measurement?

- a The maximum demand of the installation
 - b The rating of the circuit protective device
 - c The prospective short-circuit current at the origin of the installation
 - d The csa of the tails
-

Notes

9 Every installation should be divided into individual circuits to

- a prevent faults developing
- b provide protection against electric shock
- c minimize inconvenience in the event of a fault
- d ease installation.

10 Diversity may be taken into account when considering

- a maximum demand of the installation
- b a TN-C-S system
- c the prospective short-circuit fault current
- d the number of final circuits.

11 Which one of the following is not a characteristic of the supply?

- a The nature of the current and frequency
- b The earth fault loop impedance external to the installation
- c Main switch current rating
- d The nominal voltage

12 BS 7671 requires designers to take into account the frequency and quality of maintenance an installation can reasonably be expected to receive when

- a assessing staff numbers
- b inspecting and testing
- c selecting staff
- d specifying or selecting equipment reliability.

Section 4**13 Which one of the following is not part of the requirements for fault protection?**

- a Protective earthing
- b Protective equipotential bonding
- c Automatic disconnection
- d Protection by insulation of live parts

14 The maximum disconnection time for a TN system with a nominal voltage of 400 V a.c. to Earth is

Notes

- a 0.2 second
- b 0.4 second
- c 0.5 second
- d 5 seconds.

15 For a TT system, which one of the following conditions should be fulfilled for each circuit protected by an RCD?

- a $R_A \times I_{\Delta n} \leq 50 \text{ V}$
- b $R_A \times I_{\Delta n} \geq 50 \text{ V}$
- c $R_A \times I_d \leq 50 \text{ V}$
- d $R_A \times I_d \geq 50 \text{ V}$

16 A 32 A type B circuit-breaker is used to give a disconnection time of 5 seconds in a reduced low voltage system with a nominal voltage to Earth (U_0) of 55 V. What is the maximum value of earth fault loop impedance (Z_S)?

- a 0.44 Ω
- b 0.34 Ω
- c 0.17 Ω
- d 0.09 Ω

17 A SELV source can be derived from which one of the following?

- a Double-wound transformer
- b Autotransformer
- c Safety isolating transformer
- d Step-up transformer

18 Which one of the following cannot be used as basic protection?

- a Insulation of live parts
 - b Barriers or enclosures
 - c Protective earthing and bonding
 - d Obstacles
-

Notes

19 In order to provide basic protection, a horizontal top surface of a barrier or enclosure that is readily accessible shall provide a minimum degree of protection of

- a IPXXA or IP1X
 - b IPXXB or IP2X
 - c IPXXC or IP3X
 - d IPXXD or IP4X.
-

20 Where arcs, sparks or particles at high temperature may be emitted by fixed equipment in normal service, the equipment shall be

- a totally enclosed in arc-resistant material
 - b protected by a 30 mA RCD
 - c enclosed to at least IP55
 - d accessible only by use of a key or tool.
-

21 Except where otherwise recommended by the manufacturer, spotlights and projectors rated at over 100 W and up to 300 W shall be installed at a minimum distance from combustible materials of

- a 0.5 m
 - b 0.6 m
 - c 0.8 m
 - d 1.0 m.
-

22 In locations with increased risks of fire, motors which are automatically or remotely controlled, or which are not continuously supervised, shall be protected against excessive temperature by

- a a protective device that is automatically reset
 - b a protective device with manual reset
 - c electronic monitoring equipment that resets
 - d electronic monitoring equipment that restarts the motor.
-

Notes

23 Where particular risks of fire exist, the classification for high density occupation areas with easy conditions of evacuation is

- a BD1
- b BD2
- c BD3
- d BD4.

24 When considering protection against overload, the symbol for the current ensuring effective operation of the protective device in the conventional time is

- a I_b
- b I_z
- c I_n
- d I_2 .

25 For protection against overvoltage a 230 V electricity meter should have an impulse withstand of

- a 6 kV
- b 4 kV
- c 2.5 kV
- d 1.5 kV.

26 What is the impulse category of equipment that is part of the fixed electrical installation and other equipment where a high degree of availability is expected?

- a I
- b II
- c III
- d IV

Section 5

27 If the construction of equipment is unsuited to the external influences of its location, it should be

- a given a plastic coating
 - b given a zinc finish
 - c provided with additional protection during erection
 - d supplied by SELV only.
-

Notes

28 A permanent label to BS 951 bearing the words 'Safety Electrical Connection – Do Not Remove' is not required at

- a the connection of every earthing conductor to an earth electrode
- b the point of connection of every bonding conductor to an extraneous-conductive-part
- c the main earth terminal, where separate from the main switchgear
- d a main earthing bar contained within switchgear.

29 A functional switch has to be provided for each part of the circuit

- a that may require independent control
- b 1200 mm from the floor
- c for safe isolation
- d for emergency switching purposes.

30 A firefighter's switch shall be provided in the low voltage circuit supplying exterior electrical installations and interior discharge lighting operating at

- a a voltage exceeding low voltage
- b low voltage
- c voltage band II
- d medium voltage.

31 A plug and socket-outlet may be used for switching off for mechanical maintenance as long as it does not have a rating exceeding

- a 13 A
- b 16 A
- c 32 A
- d 45 A.

32 If an area within an installation undergoes a 10 °C rise in ambient temperature, the effect on the current-carrying capacity of cables will be to

- a decrease the value of I_z
- b increase the value of I_z
- c leave I_z unchanged
- d increase the fault current by 10 per cent.

Notes

33 A multicore 70 °C thermoplastic cable with 2.5 mm² conductors supplies a single-phase load of 20 A at 230 V a.c. over a distance of 22 metres. The voltage drop in the cable will be

- a 6 V
- b 6.6 V
- c 7.92 V
- d 9.2 V.

34 Where a 3-core cable, with cores coloured brown, black and grey, is used as a switch wire for two-way or intermediate control, the terminations of the conductors shall be identified using

- a red, blue and yellow tape
- b black tape only on each core
- c brown tape on the black and grey cores
- d self-colour tape only.

35 Which one of the following cannot be used as an earth electrode?

- a Earth plates
- b Welded reinforcement of concrete embedded in the earth
- c Earth tapes
- d Gas and water utility pipes

36 An earthing conductor buried in the ground is protected against corrosion by a sheath, but is not protected against mechanical damage. The minimum size copper conductor that may be installed is

- a 2.5 mm²
- b 16 mm²
- c 25 mm²
- d 50 mm².

notes

37 Assuming that both the line and protective conductors are of the same material, for a line conductor of 10 mm² if the protective conductor is to be selected, the minimum tabulated cross-sectional area of its associated protective conductor is

- a 6 mm²
 - b 10 mm²
 - c 16 mm²
 - d 35 mm².
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38 A radial final circuit feeding socket-outlets supplying several items of data processing equipment has a total protective conductor current in normal service of 18 mA. This circuit must have a high integrity protective conductor

- a of cross-sectional area less than 1 mm²
 - b connected as a ring
 - c controlled by an isolator
 - d enclosed in insulated conduit only.
-

39 A static type uninterruptible power supply source shall comply with

- a BS 3036
 - b BS 1361
 - c BS EN 60898
 - d BS EN 62040.
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40 Where an autotransformer is connected to a circuit having a neutral conductor, the common terminal of the winding shall be connected to the

- a neutral conductor
 - b line conductor
 - c protective conductor
 - d bonding conductor.
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41 When selecting wiring systems for safety services, the type of cable that should be used in fire conditions should comply with

Notes

- a BS 5467
- b BS 6231
- c BS 7211
- d BS EN 50362.

Section 6

42 When carrying out a visual inspection of an electrical installation, which one of the following does not have to be verified?

- a The methods of protection against electric shock
- b The electricity supplier
- c The connection of conductors
- d The presence of undervoltage protective devices

43 Certain information must be made available to persons carrying out inspection and testing of an installation before the testing commences. One such item of information would be

- a the name of the client
- b the name of the person who designed the installation
- c the length of cable runs in the installation
- d any circuit or equipment vulnerable to a typical test.

44 When carrying out an inspection of a new installation, it is not necessary to verify the

- a total earth fault loop impedance for each circuit
- b connection of conductors
- c methods of protection against electric shock
- d presence of diagrams, instructions and similar information.

45 An insulation resistance test is to be carried out on a 3-phase 400 V circuit. The test voltage and minimum acceptable reading would be

- a 250 V a.c. and 0.5 M Ω
 - b 500 V d.c. and 0.5 M Ω
 - c 500 V d.c. and 1 M Ω
 - d 800 V d.c. and 0.5 Ω .
-

otes

46 When an addition is made to an existing installation, the contractor shall record on the Electrical Installation Certificate or the Minor Electrical Installation Works Certificate any

- a changes in ownership
- b records of repair over the last five years
- c defects in the existing installation
- d voltage drop in the longest circuit.

47 After completion of a periodic inspection, the completed documentation shall be given to the

- a person ordering the inspection
- b local authority
- c insurance company
- d main contractor.

Section 7

48 In a room containing a bath, electrical equipment installed in zone 0 shall have a degree of protection of at least

- a IPX5
- b IP5X
- c IP7X
- d IPX7.

49 A flush downlighter in the ceiling less than 2.5 m height above floor level over a bath will need to fulfil the requirements of

- a zone 2
- b zone 1
- c zone 0
- d all zones.

50 Which of the following protective measures is permitted in a room containing a bath or shower?

- a Obstacles
- b Placing out of reach
- c Automatic disconnection of supply
- d Non-conducting location

51 In a swimming pool or other basin, the metallic covering or sheath of a wiring system in zones 0, 1 or 2 shall

Notes

- a not be used
 - b not be earthed
 - c be connected to the supplementary bonding
 - d have reinforced insulation.
-

52 The requirements of Section 704 of BS 7671 apply to

- a cloakrooms
 - b offices
 - c construction and demolition site installations
 - d toilets.
-

53 In locations where livestock is kept, for all circuits other than socket-outlet circuits, an RCD shall be provided with a rating not exceeding

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

54 Equipment on a pontoon in a marina that is subject to impact to level AG2 should have a mechanical protection code of

- a IPX4
 - b IPX8
 - c IP55
 - d IK08.
-

55 For marinas, the classification of external influence which does not need to be considered is

- a AD
 - b AE
 - c AF
 - d AP.
-

Notes

56 In caravans, each final circuit shall be protected against overcurrent by a device that disconnects

- a all live conductors in that circuit
- b the line conductors only
- c line, neutral and protective conductors
- d the caravan and site supply system.

57 Electric dodgems shall only be operated at voltages not exceeding

- a 120 V a.c. or 50 V d.c.
- b 50 V a.c. or 120 V d.c.
- c 110 V a.c. reduced low voltage
- d 1000 V a.c. or 1500 V d.c.

Section 8

58 The requirements of the licensing authority should be ascertained for

- a installations on caravan parks
- b temporary supplies
- c types of earthing system to be used
- d the design of the installation.

59 I_2 can be greater than $1.45 I_2$ when the overcurrent device

- a is providing overload protection
- b is a circuit-breaker
- c is rated at over 100 A
- d is providing fault current protection only.

60 External influences coded BE are classified as

- a nature of processed or stored materials
 - b conditions of evacuation in an emergency
 - c movement of air
 - d capability of persons.
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