5357 Level 3 Electrotechnical / 2365 Level 2 and 3 Diploma in Electrical Installations (Buildings and Structures)

Sample papers
What criteria does an employer have to meet when it becomes a legal requirement to have a written health and safety policy?

A. Limited company status.
B. Under instruction from the local authority.
C. When employing five or more people
D. After accident has happened on site.

Which regulation requires an employer to ensure a power drill they provide an employee is suitable for use?

A. Current edition of the Building Regulations.
B. Provision and Use of Work Equipment Regulations.
C. Personal Protective Equipment at Work Regulations.
D. Electricity Safety, Quality and Continuity Regulations.

Which framework covers the legal disposal of waste solvent glue?

A. The Electricity at Work Regulations.
B. The Environmental Protection Act.
C. The Hazardous Waste Regulations.
D. The Health and Safety at Work Act.

Which legislation allows local authorities to monitor construction sites to ensure the nuisances such as dust and noise are compliant with agreed limits?

A. The Health and Safety at Work Act.
B. The Electricity at Work Regulations.
C. The Hazardous Waste Regulations.
D. The Control of Pollution Act.
What is the immediate action required when a colleague has received a burnt hand when working in a kitchen?

A. Send for help.
B. Place a dry dressing over the wound.
C. Isolate the supply of heat.
D. Place the wound under running water.

What is the immediate action to be taken when a worker has slipped on site and sustained a back injury?

A. Apply emergency first aid.
B. Phone the emergency services.
C. Place them in the recovery position.
D. Try to diagnose the extent of their injuries.

Who must be notified immediately when an operative sustains a back injury from carrying a load?

A. A solicitor.
B. Co-workers.
C. A health centre.
D. The supervisor.

What are the most common construction site pollutants of water courses and rivers?

A. Cement and grout.
B. Oil and silt.
C. Cement and oil.
D. Grout and silt.

What regulations specify the requirements for disposal of low pressure sodium lamps?

A. WEEE
B. HASWA
C. EAWR
D. COSHH
Why is it important to report asbestos immediately if it is suspected as being present?
A. To prevent unnecessary exposure.
B. To ensure the job is not held up.
C. To prevent completion delay penalties.
D. To comply with RIDDOR.

What action is required when a work process is risk assessed as 'High' risk?
A. Stop the activity immediately and complete set actions.
B. Continue working and complete corrective actions within a week.
C. Continue working and complete corrective actions within a month.
D. Stop the activity within a week and complete set actions.

What is the most appropriate action to reduce the risk of harm to workers when damaged asbestos is encountered in a building?
A. Use barriers around the area in the building affected.
B. Issue all workers with dust masks and safety glasses.
C. Have the asbestos professionally removed immediately.
D. Use sheeting to cover the localised damaged area.

What item of PPE must be used when drilling a hole in a steel wall bracket using a pillar drill?
A. Safety boots.
B. Leather gloves.
C. Safety goggles.
D. Hard hat.

What must the first aid provision for a construction site reflect?
A. The competence of persons employed.
B. The probable injuries expected.
C. The distance from the hospital.
D. The number of first aiders.

Why is it important to replace first aid supplies each time they are used?
A. To comply with COSHH regulations.
B. To comply with RIDDOR requirements.
C. To ensure accidents can be effectively prevented.
D. To ensure resources are always available in case of accidents.
16. What certification defines an operative’s competence to erect a mobile scaffold tower?
   A. EAWR
   B. PASMA
   C. HASWA
   D. ESQCR

17. What is the main risk to an electrician when safe isolation is not carried out on a live circuit being worked on?
   A. Electric shock caused by direct contact.
   B. Electrical shock caused by indirect contact.
   C. Electric shock caused by static discharge.
   D. Electrical shock caused by electromagnetic interference.

18. What type of hazardous substance is classified by the label shown in the image?
   A. Explosive.
   B. Harmful.
   C. Toxic.
   D. Oxidising.

19. What health and safety term defines the potential exposure of a worker to loud noise?
   A. A risk.
   B. A hazard.
   C. An accident.
   D. An occurrence.

20. What is the specific hazard when cables are run in thermal insulation?
   A. Fire.
   B. Burns.
   C. Explosion.
   D. Electric shock.
21. What term defines the situation where an electrician is working at height off a ladder?
   A. A risk.
   B. A hazard.
   C. An incident.
   D. An accident.

22. What practice is employed to address the potential hazard of electrical shock from trailing leads for power tools on construction sites?
   A. Use of 110 V centre tapped supplies.
   B. Use of 230 V single phase supplies.
   C. Use of 400 V three phase supplies.
   D. Use of 500 V DC single phase supplies.

23. Which type of fire extinguisher is **best** suited for use on live electrical fires?
   A. Water.
   B. Dry powder.
   C. Wet chemical.
   D. Carbon Dioxide

24. Which building component is **most** likely to contain asbestos?
   A. A cistern.
   B. Loft insulation.
   C. Cavity wall insulation.
   D. An unvented hot water cylinder.

25. What is the first action that **must** be taken when suspected asbestos is identified during refurbishment work of a dwelling?
   A. Obtain appropriate PPE.
   B. Seal the suspected material with paint.
   C. Remove the affected area and place in bags.
   D. Stop work immediately.
Sample e-volve MC Test

1. What can 200 MΩ also be expressed as?
   A. 200x10⁻⁹ Ω
   B. 200x10⁻⁶ Ω
   C. 200x10⁶ Ω
   D. 200x10⁹ Ω

2. In the triangle shown, what is the length of side ‘a’?
   A. 2 cm
   B. 6 cm
   C. 9 cm
   D. 12 cm

3. What is the volume of a room that measures 3 m in width, 8 m in length, and the ceiling is 2.4 m high?
   A. 13.4 m²
   B. 13.4 m³
   C. 57.6 m²
   D. 57.6 m³
4. What is the SI unit of measurement for temperature?
   A. °C (Centigrade).
   B. °F (Fahrenheit).
   C. °K (Kelvin).
   D. °T (Temps).

5. Hertz is the SI unit of measurement for what quantity?
   A. Resistivity.
   B. Frequency.
   C. Reactance.
   D. Capacitance.

6. What is the formula used to determine Impedance?
   A. \( \sqrt{R^2 - X^2} \)
   B. \( \frac{R}{Z} \)
   C. \( \sqrt{R^2 + X^2} \)
   D. \( \frac{Z}{R} \)

7. How must a voltmeter be connected to measure the potential difference across a load in a DC circuit?
   A. In parallel with the load.
   B. In series with the load.
   C. Using an inverter.
   D. Using a rectifier.

8. Which one of the following formulae is used to determine weight?
   A. \( \text{mass} \times \text{gravity} \)
   B. \( \frac{\text{gravity}}{\text{force}} \)
   C. \( \text{gravity} \times \text{force} \)
   D. \( \frac{\text{gravity}}{\text{mass}} \)
9. Which device is a claw hammer being used as when extracting a nail from a piece of wood?
   A. A pulley.
   B. A lever.
   C. A winch.
   D. A jack.

10. Approximately what force is needed to raise the 500 kg mass shown in the diagram?
   A. 125 N
   B. 250 N
   C. 500 N
   D. 1250 N

11. What is stored energy also known as?
   A. Potential energy.
   B. Kinetic energy.
   C. Shear energy.
   D. Idle energy.

12. What is the input of an electric motor with an output of 2.1 kW, that has an efficiency of 85%?
   A. 0.525 kW
   B. 2.47 kW
   C. 2.95 kW
   D. 3.27 kW
What would be the approximate power required to raise a 500 kg mass to a height of 50 m in 90 seconds?
A. 0.277 kW
B. 2.72 kW
C. 37.5 kW
D. 55.5 kW

What is the input of an electric motor with an output of 5 kW that has an efficiency of 80%?
A. 4 kW.
B. 4.25 kW.
C. 6 kW.
D. 6.25 kW.

Which atomic part flows when current flows?
A. Protons.
B. Centrons.
C. Neutrons.
D. Electrons.

Which one of the following is the best conductor?
A. Gold.
B. Lead.
C. Brass.
D. Copper.

A conductor measuring 50 m in length has a resistance of 0.4 Ω. What would be its resistance if its length is reduced to 25 m?
A. 0.2 Ω
B. 0.4 Ω
C. 0.6 Ω
D. 0.8 Ω
18 What is the length of a 4 mm² copper conductor having a measured resistance of 0.089 Ω if the resistivity of copper is 0.0178 μΩm?

A. 20 m
B. 30 m
C. 40 m
D. 50 m

19 What is the relationship between voltage and current across the resistors for the circuit shown?

A. Same voltage, same current across each resistor.
B. Different voltage, same current across each resistor.
C. Same voltage, different current across each resistor.
D. Different voltage, different current across each resistor.

20 Which one of the following statements is correct for a series circuit?

A. The voltage varies across the resistors but the current is constant.
B. The current varies across the resistors but the voltage is constant.
C. The resistance and current varies when the voltage is constant.
D. The voltage and current remains constant when resistance changes.
For the circuit shown, what would be the voltage reading of voltmeter (V1)?

A. 20 V  
B. 30 V  
C. 50 V  
D. 60 V

For the circuit shown, what would be the voltage reading of voltmeter (V1)?

A. 30 V  
B. 50 V  
C. 150 V  
D. 200 V
What would be the total supply current (I_{s}) for the circuit shown?

A. 0.33 A  
B. 1.33 A  
C. 3.33 A  
D. 10.0 A  

How would the current passing through the 20 \, \Omega resistor be determined for the circuit shown?

A. Dividing the supply voltage by 20 \, \Omega.  
B. Multiplying the supply voltage by 20 \, \Omega.  
C. It would be half the total supply current.  
D. It would be equal to the total supply current.
What would be the total circuit resistance if a parallel circuit contained five resistors all having a resistance of 50 Ω?

A. 0.1 Ω
B. 5 Ω
C. 10 Ω
D. 50 Ω

What would a circuit containing several resistors be classified as if the total resistance is found by adding all the resistors together?

A. Series.
B. Transverse.
C. Parallel.
D. Reciprocal.

What is the power dissipated in the circuit shown?

A. 100 W.
B. 300 W.
C. 1 kW.
D. 3 kW.
28. Voltage drop in a circuit is affected by the resistance of what cable part?
   A. The line conductor only.
   B. The line and neutral conductors.
   C. The line and earthing conductors.
   D. The line, neutral and earthing conductors.

29. What would be the effect of placing a copper clad earth electrode into soil, close to a lead water pipe?
   A. Electrolysis.
   B. Soil heating.
   C. Short circuits.
   D. Calcium build up.

30. What would be the effect of placing the south poles of two magnets together?
   A. The two magnets would be drawn together.
   B. The two magnets would be pushed away from each other.
   C. The strength of the magnets would be doubled.
   D. The strength of the magnets would be halved.

31. Which unit is used to measure the strength of the magnetic field produced by a permanent magnet?
   A. Weber.
   B. Henry.
   C. Tesla.
   D. Farad.

32. What would be the force exerted on a conductor 20 cm long, carrying a current of 2 A, when placed at right angles to a magnetic field of flux density 8 Tesla?
   A. 3.2 N
   B. 16 N
   C. 32 N
   D. 48 N
33 What would be the effect on the magnetic field when reducing the amount of current flowing through a coil?
A. The strength of the magnetic field will increase.
B. The strength of the magnetic field will decrease.
C. The strength of the magnetic field will vary.
D. The strength of the magnetic field will remain constant.

34 Which simple device consists of a coil of wire which is rotated within a magnetic field by an exterior force?
A. Motor.
B. Rectifier.
C. Inverter.
D. Generator.

35 What would be the flux change in a coil that induces an EMF of 150 V and takes 10 ms for the current to fall to zero?
A. 0.15 Wb.
B. 1.5 Wb.
C. 15 Wb.
D. 150 Wb.

36 What does the value B, indicate in the figure shown?
A. Average value of the waveform.
B. Periodic time of the waveform.
C. RMS value of the waveform.
D. Peak amplitude of the waveform.

37 Which electronic component is used to amplify low level signals from PIR detectors, to higher levels that can trigger the alarm circuit?
A. Thyristor.
B. Capacitor.
C. Transistor.
D. Resistor.
38 Which electronic component is used in a remote control device to pulse a pattern that a receiver recognises and responds accordingly?
A. Zener Diode.
B. Photo Diode.
C. Thermonic Diode.
D. Light Emitting Diode.

39 Which electronic component’s resistance will vary significantly more than standard resistors with temperature?
A. Thermistor.
B. Capacitor.
C. Transistor.
D. Inverter.

40 Which electronic component is a semiconductor that converts light into current?
A. Zener Diode.
B. Photo Diode.
C. Capacitor.
D. Transistor.
5357-004 Understand Design and Installation Practices and Procedures

* This unit does not share content with 2365

Sample e-volve MC Test

1. Which document details the exact dimensions of particular luminaires?
   A. Site Plans.
   B. Manufacturer’s data.
   C. Wiring diagrams.
   D. Design Specification.

2. Which document is non-statutory?
   A. IET Wiring Regulations.
   B. Electricity Safety Quality and Continuity Regulations.
   C. Electricity at Work Regulations.
   D. Health and Safety at Work etc. Act.

3. How would a site supervisor be able to account for all persons on a site, should an evacuation happen due to a fire?
   A. Ensure all deliveries are signed for.
   B. Ensure all escape routes are securely locked.
   C. Ensure all persons sign in when entering the site.
   D. Ensure all persons park in designated bays.

4. What would be the best way to identify damage to building decorations before electrical work is undertaken?
   A. Note the damage in the site diary.
   B. Highlight the details on the invoice.
   C. Take photographs after work is undertaken.
   D. Take photographs before work is undertaken.
What is the most appropriate method of protecting soft furnishings from dust caused by drilling a hole into a ceiling?
A. Vacuum clean furnishings after the work is done.
B. Remove furnishings and store off site.
C. Cover furnishings with a dustsheet.
D. Spray water over the area while drilling.

In which of the following must un-sheathed single-core insulated cable be installed?
A. Metallic Trunking.
B. Metallic basket.
C. Metallic tray.
D. PVC capping.

What is the most appropriate cable to connect a 230 V handheld portable appliance, to a fixed wiring system?
A. PVC covered MICC.
B. SPVC SWA.
C. Flexible cable.
D. Cat 6 cable.

What is an advantage of using SWA cable over flat profile cable?
A. Cheaper to install.
B. No glands required.
C. Greater mechanical strength.
D. Greater flexibility.

What must be used on long straight runs of PVC conduit systems to avoid buckling and distortion?
A. Crampet fixings.
B. Hospital saddles.
C. Expansion couplers.
D. Through boxes.
10 What type of trunking fitting is shown in the image?
A. Internal 90° bend.
B. External 180° bend.
C. Flat 90° bend.
D. Inside 180° bend.

11 What is classed as a cable containment system, suitable for un-sheathed cables?
A. Metallic tray.
B. Metallic basket.
C. PVC conduit.
D. PVC capping.

12 A conduit is 5 m in length and contains 2 bends. What size conduit is required for the stranded single-core cables shown in the image?
A. 16 mm
B. 20 mm
C. 25 mm
D. 32 mm
13 How many 6 mm² PVC single-core cables can be installed in a 100 x 75 mm trunking?
A. 50
B. 100
C. 130
D. 150

14 Which of the following cables is best suited for temporary supplies in harsh locations, such as construction sites?
A. Artic Flex.
B. MICC.
C. Flat profile twin & cpc.
D. Fire retardant cables.

15 What procedure should be followed if a power tool required for a task, is found with a damaged flex?
A. Tape over the flex and carry out the task.
B. Carry out the task and report the problem afterwards.
C. Report the item to a supervisor and do not use the power tool.
D. Carry on regardless as everything is on an RCD.

16 What is used to ensure an accessory is level?
A. Plumb line.
B. Chalk line.
C. Spirit level.
D. Laser level.

17 What is the most suitable hand tool for cutting lengths of cable tray?
A. Hacksaw.
B. Cross cut saw.
C. Coping saw.
D. Keyhole saw.
18 What type of wall would the device in the image be used for?
A. Concrete.
B. Brick.
C. Wooden.
D. Plasterboard.

19 What is the conduit fixing device shown in the image?
A. Spacer bar saddle.
B. Distance saddle.
C. U Clip.
D. P Clip.

20 What is the maximum distance between supports for a horizontal insulating trunking, having a cross-sectional area of 800 mm²?
A. 0.5 m
B. 1.25 m
C. 1.75 m
D. 2.0 m
21 What **must** be installed to protect a 230 V cable that is concealed in a wall to a depth of 20 mm and runs diagonally to an accessory?

A. A 100 mA RCD.

B. A plastic capping.

C. An earthed metal conduit.

D. An un-earthed metal armour.

22 What is the **most** suitable method of repairing a ceiling plasterboard having a hole left by a recess downlight which has been removed?

A. Apply cement to the wall and rub down to give smooth finish.

B. Cut a square of white paper and staple over the hole.

C. Insert a similar sized piece of plasterboard with support behind and finish by skimming with plaster.

D. Stick small pieces of wet toilet tissue to the sides of the hole and work towards the centre until complete.

23 What describes an overcurrent in an otherwise healthy circuit which is caused by mis-use or abuse of the circuit loading?

A. An overload.

B. An earth fault.

C. A short circuit.

D. An open circuit.

24 What protective device operates by both magnetic and thermal trips?

A. BS 88-2 devices.

B. BS 3036 semi-enclosed devices.

C. BS 1362 cartridge fuses.

D. BS EN 60898 circuit breakers.

25 What is the maximum earth fault loop impedance for a 32 A Type C circuit breaker as given in the IET On-site Guide?

A. 0.44 ohms

B. 0.55 ohms

C. 0.79 ohms

D. 1.38 ohms
26 What is the rated short circuit capacity of a BS 3036 S1A fuse as given in the IET On-site Guide?
   A. 1 kA
   B. 2 kA
   C. 3 kA
   D. 4 kA

27 A circuit has been poorly designed for selectivity between an appliance fuse and a circuit breaker protecting the entire final circuit.

   What is the most likely outcome should a single fault occur on the appliance?
   A. A fault would disconnect the appliance fuse only.
   B. A fault would cause the loss of all equipment on the circuit.
   C. A fault would cause no loss of any equipment.
   D. A fault would cause the entire supply system to disconnect.

28 What should a water heater that is fitted to a 20 litre vessel be connected to?
   A. A fused spur on a ring-final circuit.
   B. A dedicated circuit.
   C. A lighting circuit.
   D. An un-fused spur on a ring-final circuit.

29 What condition will the circuit be for a self contained, non-maintained emergency light, in normal situations?
   A. Permanently live.
   B. Only live during a mains failure.
   C. Switched by a firefighter's switch.
   D. Permanently isolated.

30 What provides undervoltage protection on a rotating machine in a factory?
   A. A contactor connected in the machine supply circuit.
   B. A circuit breaker protecting the machine circuit.
   C. An RCD fitted to the supply circuit.
   D. A surge protective device installed at the origin of the installation.
5357-005 Understand how to Plan and Oversee Electrical Work Activities

* This unit does not share content with 2365

Sample e-volve MC Test

1. A worker lacks motivation and turns up on site in a bad mood. What is the first method for an employer to address this situation?
   A. Issue a formal letter.
   B. Hold an informal discussion.
   C. Leave the situation to resolve itself.
   D. Provide the worker with simple tasks for the day.

2. A large delivery of electrical materials is expected. The vehicle will block road access and neighbouring properties for up to an hour while it is unloaded. What is the most appropriate method of communicating this to the neighbouring properties?
   A. No communication is necessary.
   B. Verbally inform the neighbours when the vehicle arrives.
   C. Post written notes informing the neighbours in advance.
   D. Inform the neighbours verbally when they ask what is going on.

3. What method would be the most suitable for monitoring materials expenditure and use for a large housing development?
   A. Written notes.
   B. Spreadsheets.
   C. Verbal communication.
   D. Supplier websites and catalogues.

4. What best describes the process where relevant site representatives meet to discuss and agree a suitable alternative location of equipment due to an issue?
   A. Instruction.
   B. Confrontation.
   C. Observation.
   D. Negotiation.
What would be the most suitable way for a company to determine the competence of an electrician with regards to health and safety awareness?

A. Check their ECS card.
B. Check their Competency Scheme Card.
C. Check with City & Guilds for information.
D. Check for part P registration.

What must be taken into consideration when allocating work for the inspection and testing stage of a new installation in a dwelling?

A. The operatives’ level of competence.
B. The presence of other trades on site.
C. The operatives’ familiarity with the site.
D. Test instrument calibration certification.

What will be immediately affected if a sub-contractor has failed to meet a planned completion date?

A. Material costs and delivery.
B. Compliance with BS 7671.
C. The existing critical path network.
D. Compliance with Building Regulations.

Which document is completed in order to make a formal change to an agreed contract?

A. Defects letters.
B. Variation order.
C. Day worksheets.
D. Daily diary record.

What is the main purpose of the visitors’ book?

A. To monitor the performance of visitors.
B. To provide accurate site emergency/evacuation data.
C. To ensure and monitor the support by local building control.
D. To provide car registration details in case delivery vehicles are obstructed.
10. What colour are 110 V BS EN 60309-2 sockets and plugs?
   A. Black.
   B. Blue.
   C. Red.
   D. Yellow.

11. What information would be taken from the programme of works?
   A. Type of accessories to be fitted.
   B. Size of cable to be installed.
   C. Rating of protected devices to be used.
   D. Length of time temporary supplies are needed.

12. What is the most important consideration when checking the suitability of equipment from the material schedule, if they are to be installed in a bathroom?
   A. Their colour.
   B. Their dimensions.
   C. Their ingress protection.
   D. Their fixing locations and type.

13. What would be checked to see if materials received are correct following an online order?
   A. Daywork sheet.
   B. Delivery note.
   C. Site diary.
   D. Variation order.

14. What are the best resources for identifying labour and material requirements for a major contract?
   A. Supplier’s catalogues and delivery schedules.
   B. Installation specification and programme of works.
   C. Manufacturer’s installation instructions and user guides.
   D. Building Regulations and local building control guidance.
What would be the **most** efficient delivery location for a large drum of SWA cable to a large factory site?
A. The main site gate.
B. The point of installation.
C. A secure storage container off site.
D. The contractor's main office off site.

What is the **most** suitable method for storing drums of cable on a large housing development site?
A. Keep in individual contractor’s vans.
B. Keep in each dwelling for use as they are required.
C. Keep in a secure controlled container/building centrally.
D. No storage required as cable should only be ordered as and when required.
Sample e-volve MC Test

1. Who, under the Electricity at Work Regulations, should the inspector ensure the safety of?
   A. Themselves.
   B. The client and others.
   C. Both themselves and others.
   D. Staff in other buildings owned by the client.

2. Where is the correct location to test that a lighting circuit is isolated and safe to work on?
   A. At the supply intake position.
   B. On the supply side of the circuit protective device.
   C. At any convenient luminaire.
   D. On the load side of the circuit protective device.

3. How many keys **must** be available for a lock that is used to securely isolate a protective device?
   A. 1.
   B. 2.
   C. 3.
   D. 4.

4. Why is safe isolation carried out?
   A. To allow earth fault loop impedance testing.
   B. To allow phase sequencing testing.
   C. To stop RCDs operating when testing.
   D. To stop contact with live parts.
Testing is to be carried out at the origin of a large, unoccupied building which has a standby generator. What must be done before tests are carried out?
A. Check the operation of the standby supply.
B. All main protective bonding must be disconnected.
C. Temporary lighting must be installed for all escape routes.
D. The standby supplies must be isolated to ensure safe testing.

The implications of not carrying out a safe isolation could lead to prosecution. Which statutory legislation would be used for this purpose?
A. COSHH.
B. ESCQR.
C. EAWR.
D. BS 7671.

Which document is statutory?
A. BS 7671.
B. EAWR.
C. GN3.
D. GS38.

Which publication does not include model forms that can be used for certification and reporting purposes?
A. HSE Guidance Note GS38.
B. The IET On-Site Guide.
C. IET Guidance Note 3.
D. BS 7671.

Which test would not apply to an electrical installation forming part of a TN-S system?
A. Earth fault loop impedance.
B. Insulation resistance.
C. Earth electrode resistance.
D. Functional tests.
10 Which test could also indicate the supply polarity?
A. External earth fault loop impedance.
B. Continuity of protective conductors.
C. Insulation resistance.
D. Continuity of ring final circuits.

11 What is the unit of measurement for recording continuity of protective conductor results?
A. mΩ.
B. Ω.
C. kΩ.
D. MΩ.

12 What unit of measurement must an insulation resistance tester indicate?
A. mΩ.
B. Ω.
C. kΩ.
D. MΩ.

13 What can be done in order to ensure that instrument readings are accurate?
A. Check that serial numbers are present.
B. Ensure that instruments have BS numbers.
C. Ensure that the test lead fuses are removed.
D. Regularly check instruments against known values.

14 What does HSE guidance recommend for detachable test leads used on a single instrument?
A. They must be over 3 m long.
B. They must be at least 2.5 mm² csa.
C. They must only have single insulation.
D. They must be different colours.

15 What would not be a requirement before using test instruments?
A. Checking for damage before use.
B. Recording details of the instrument supplier.
C. Ensuring the instrument functions correctly.
D. Ensuring the supply is isolated before commencing dead tests.
16 What is the most likely reason for continuity of protective bonding conductor results being higher than expected?
A. The lead resistance has not been subtracted from the result.
B. The lead resistance has not been added to the result.
C. The leads are too short to carry out the test correctly.
D. The leads are too long to carry out the test correctly.

17 What could be the reason for obtaining a satisfactory result, even if the conductor is broken, when testing the continuity of a main protective bonding conductor which is not disconnected at either end?
A. Using an un-calibrated instrument.
B. The instrument is set on the wrong scale.
C. The test leads being too long.
D. The presence of parallel paths.

18 Which value would be obtained when a continuity of circuit protective conductors test, is measured at the furthest point on a radial circuit, using a temporary link between line and cpc at the distribution board?
A. $R_1$
B. $R_2$
C. $(R_1 + R_2)$
D. $(R_1 - R_2)$

19 Which one of the following is not a reason for conducting a ring final circuit continuity test?
A. To check that the cable insulation is sufficient.
B. To check the correct connection of each item on the circuit.
C. To check the circuit is in the form of a ring with no interconnections.
D. To check the continuity of the line, neutral and protective conductors.

20 What would be indicated by the readings below, during a test of ring final circuit continuity?

<table>
<thead>
<tr>
<th>Line – Line loop reading</th>
<th>0.1 Ω</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neutral – Neutral loop reading</td>
<td>0.1 Ω</td>
</tr>
<tr>
<td>cpc – cpc loop reading</td>
<td>0.167 Ω</td>
</tr>
</tbody>
</table>

A. The cpc is a shorter length than the live conductors.
B. The cpc is the same csa as the live conductors.
C. The cpc is a larger csa than the live conductors.
D. The cpc is a smaller csa than the live conductors.
21. What would be the minimum acceptable value of insulation resistance for a 230 V lighting circuit?
   A. 0.5 MΩ.
   B. 1 MΩ.
   C. 2 MΩ.
   D. 4 MΩ.

22. What would be the insulation resistance of cable, when the length is doubled, if the original value is 10 MΩ?
   A. 2.5 MΩ.
   B. 5 MΩ.
   C. 10 MΩ.
   D. 20 MΩ.

23. What should be confirmed during a test for polarity?
   A. Continuity of line conductors.
   B. Continuity of protective conductors.
   C. Outer metal contacts of ES lamps are connected to the line conductor.
   D. Single-pole switches and devices are connected in the line conductor only.

24. Which instrument should be used for testing polarity of the incoming supply to an installation?
   A. A low resistance ohmmeter.
   B. An insulation resistance tester.
   C. An approved voltage indicator.
   D. An earth electrode resistance tester.

25. The BS 7671 maximum tabulated earth fault loop impedance value for a protective device is 2.73 Ω. What is the maximum measured value of earth fault loop impedance permitted for a circuit protected by this device?
   A. 3.41 Ω.
   B. 2.73 Ω.
   C. 2.18 Ω.
   D. 2.04 Ω.
26. What would be recorded as $I_{pf}$ when PEFC and PSCC at the origin of a three-phase installation are tested using a single-phase instrument, and values of 0.9 kA and 1.5 kA were measured respectively?
   A. 0.9 kA.
   B. 1.5 kA.
   C. 2.4 kA.
   D. 3.0 kA.

27. What reading would be recorded on the electrical installation certificate if the prospective fault current for a single-phase electrical installation is measured between line to earth and line to neutral?
   A. The line to earth value doubled.
   B. The line to neutral value doubled.
   C. The lower of the two values.
   D. The higher of the two values.

28. A test of prospective fault current at the origin of an installation has been carried out. What should the result be compared with?
   A. The breaking capacity of the main protective device.
   B. The breaking capacity of the main isolator.
   C. The nominal current rating of the main protective device.
   D. The nominal current rating of the main isolator.

29. Where is the correct location to connect test leads, within an installation, in order to test an RCD?
   A. As close as possible to the RCD on the supply side.
   B. At a suitably safe location on the supply side of the RCD.
   C. As far away as possible from the RCD on the supply side.
   D. At a suitably safe location on the load side of the RCD.

30. What could not be verified by the use of a rotating disc type instrument?
   A. Correct labelling/identification of plain conductors.
   B. Phase sequence at the origin of the supply to an installation.
   C. Disconnection of protective devices with the specified times.
   D. Direction of rotation at the supply terminals of a three phase motor.
31. Which one of the following supplies would not require phase sequence testing?
   A. Two-wire TN-C-S.
   B. Three-wire TN-S.
   C. Four-wire TN-S.
   D. Four-wire TN-C-S.

32. What is the purpose of operating the integral test button of an RCD?
   A. To confirm the function of the mechanical parts.
   B. To ensure it disconnects at the specified fault currents.
   C. To isolate the RCD prior to carrying out instrument tests.
   D. To reset the RCD following the required instrument tests.

33. Who should be provided with the original copies of test documentation upon completion of a rewire of a rented domestic property?
   A. The client.
   B. The tenant.
   C. The local authority.
   D. The insurance company.

34. Which document should the customer be provided with after the installation of a new shower circuit?
   A. An Electrical Installation Certificate.
   B. An Electrical Installation Condition Report.
   C. A Minor Electrical Installation Works Certificate.
   D. A copy of the test equipment calibration certificate.

35. What are the options, when filling in the boxes on a Schedule of Inspection, for a new installation?
   A. ✓ : X : N/A : LIM.
   B. ✓ : X : N/A.
   C. ✓ : X : LIM.
   D. ✓ : N/A.
What is the most appropriate method to protect against electric shock when carrying out fault diagnosis work?

A. Comply with COSHH.
B. Comply with the WEEE regulations.
C. Comply with the EaWR 1989.
D. Comply with ESQCR 2002.

Why would a method statement be used by an experienced operative before undertaking work on an installation to diagnose a fault?

A. To reduce the cost implications of the work to be undertaken.
B. Ensure effective billing of the work procedure or process.
C. Ensure Health and Safety requirements are considered.
D. To monitor customer satisfaction for trade reviews.

Which standard must test leads comply with in order to help avoid electric shock when undertaking fault finding and diagnosis work?

A. GN3
B. BS 7671
C. GS38
D. BS 3036

Which document should be completed when replacing an existing faulty fan isolator switch?

A. An Electrical Installation Certificate.
B. A Condition Report Inspection Schedule.
C. An Electrical Installation Condition Report.
D. A Minor Electrical Installation Works Certificate.
Who would an operative need to keep informed of serious faults found on the lighting circuits in a fully functioning commercial unit?

A. Manufacturers of the test instruments.
B. Specialist equipment manufacturers.
C. The Health and Safety Executive.
D. The clients or their representative.

A client has reported that a number of space heaters have stopped working following extensive use during a cold spell. Which of the following items would be the most likely to be checked during testing for fault diagnosis purposes?

A. Prospective short circuit current.
B. External earth fault loop impedance.
C. Phase sequencing and insulation resistance.
D. Circuit supply voltage and protective device status.

What is the most likely outcome following a small leakage between neutral and earth due to water ingress in the connections of a luminaire?

A. High earth fault currents causing the main DNO fuse to operate.
B. Phase sequencing becoming reversed causing machinery faults.
C. High short circuit currents causing circuit fuses to operate.
D. Residual current flow to earth causing the operation of an RCD.

What is the most likely reason for the sound of arcing within a contactor, controlling heaters, each time the load is on and running?

A. A loose connection.
B. A transient overvoltage.
C. A low resistance joint.
D. A dead short in the circuit.

Where is a short circuit in a cable most likely to be located?

A. Where the containment has mechanical damage.
B. An over tightened termination in an accessory.
C. At the joint on the top of the circuit breaker.
D. Where ambient temperature decreases.
What fault would an experienced operative suspect if the final socket-outlet on a radial circuit was not operating but the rest of the outlets on the circuit were?

A. Open circuit at the origin of the circuit.
B. Short circuit at the origin of the circuit.
C. Open circuit at the final socket-outlet on the circuit.
D. Short circuit at the final socket-outlet on the circuit.

What is the most likely reason for a 15 A re-wireable fuse, protecting a radial socket outlet circuit that is reported to ‘blow every so often’?

A. Transient overvoltage.
B. Open circuit in the line.
C. Occasional overloading.
D. Poor metering at the intake.

What precautions would an inspector need to consider when undertaking fault diagnosis work to stairway lighting, in an occupied multi-storey building that has back up supplies?

A. Ensure that the emergency lights are functioning correctly.
B. Ensure the risk assessments are completed and followed.
C. Ensure the standby generators are connected to the DNO supply.
D. Ensure that all access equipment is non-metallic and tagged as ‘safe’.

Which one of the following is the most likely test that will cause damage to sensitive equipment when testing to identify faults within an installation?

A. A continuity of protective conductors test.
B. An earth fault loop impedance test.
C. A prospective fault current test.
D. An Insulation resistance test.

What is the main risk when an operative undertakes live fault diagnosis work on an old piece of equipment containing electronic components?

A. Noxious fumes.
B. Electric shock.
C. That RCD testing may not be suitable.
D. That continuity testing may cause damage.
15 Why is it important to have a logical sequence in respect of the stages of fault diagnosis and correction?
A. To ensure compliance with the EaWR 1989.
B. To avoid inconvenience to other contractors.
C. To ensure compliance with BS 7671.
D. To avoid wasting time and effort.

16 At what minimum voltage must an operative consider the use of GS 38 test leads?
A. Between 4 V and 24 V DC.
B. < 50 V AC and > 120 V DC.
C. High voltage only.
D. > 50 V AC and > 120 V DC.

17 Which one of the following instruments is most appropriate when verifying the isolation of a three-phase AC supply to a motor?
A. A clamp meter.
B. A phase rotation tester.
C. A loop / PSC tester compliant to GS 38.
D. An approved voltage indicator to GS 38.

18 What is the correct unit that would be displayed on an RCD tester when confirming compliance with additional protection?
A. mA
B. IΔN
C. ms
D. mΩ

19 What is the most appropriate method of finding the location of an open circuit in the cpc of a radial socket-outlet circuit supplying a number outlets?
A. Using a prospective earth fault test at the end of the circuit.
B. Using an earth fault loop impedance tester at the origin.
C. Using a continuity tester at the mid-point of the circuit.
D. Using an insulation resistance tester on the supply to the circuit.
20. What type of circuit would have a **minimum** acceptable insulation resistance value of 0.5 MΩ between live conductors?

   A. PELV.
   
   B. FELV.
   
   C. Reduced-Low voltage.
   
   D. Low voltage.

21. What would be the approximate voltage drop on a 35 m long radial circuit that has a combined live conductor resistance of 0.54 Ω at 20 °C, and a load current of 16 A?

   A. 35.54 V
   
   B. 18.91 V
   
   C. 10.36 V
   
   D. 4.64 V

22. What is the most significant factor to consider when needing to replace a DOL starter switch on an old lathe in a small workshop?

   A. Ability to test the old parts.
   
   B. Accessibility of old test data.
   
   C. Provision of temporary supplies.
   
   D. Availability of replacement parts.

23. What is the most significant factor when deciding upon whether to replace or repair a faulty component on a production line in a meat packing factory with a 24 hour, 7 day week shift pattern during the fault finding process?

   A. Supply earthing arrangements.
   
   B. Access to welfare facilities.
   
   C. Packing staff availability.
   
   D. Loss of production.

24. Which one of the following is the main consideration when carrying out major fault diagnosis work in the freezer section in a supermarket?

   A. Emergency lighting and access equipment.
   
   B. The cost of the replacement equipment.
   
   C. Suitable high visibility and warm clothing.
   
   D. Temporary power supplies for the freezers.
25 What is the main consideration after fault diagnosis and rectification work has been undertaken in a small 10 year old commercial installation?

A. The designer has signed the original certificate.
B. Access to and size of the installation.
C. All diagnosis is undertaken out of hours.
D. All repairs are correctly certificated.

26 What testing must the home owner be encouraged to undertake quarterly, following the rectification of a fault on an RCD protecting a socket-outlet rated at 13 A for outdoor use?

A. Earth fault loop impedance.
B. Insulation resistance.
C. Electrical separation.
D. Functional tests.

27 What test result would an experienced operative be looking for, when verifying continuity, following the successful replacement of a short main protective bonding conductor to metallic gas pipe within an installation due to damage?

A. < 1 kΩ but > 1000 Ω
B. > 1 kΩ but < 1 MΩ
C. < 1 kΩ but > 1 Ω
D. > 10 mΩ but < 1 Ω

28 Which test instrument setting would be used to test an RCD for Additional Protection?

A. 0.5 x I_{AN}
B. 1 x I_{AN}
C. 2 x I_{AN}
D. 5 x I_{AN}

29 What is the correct symbol to verify on a data plate when checking to see if a new three-phase piece of equipment is compatible for supply voltage before it is installed?

A. MV
B. mV
C. U₀
D. U
Which one of the following regulations **must** be considered when disposing of compact fluorescent lamps?

A. RiDDOR.
B. COSHH.
C. WEEE.
D. EaWR.