203: Electrical installations technology  
**Sample questions version A**

**Answer guide**

**There are 40 multiple choice questions. Answer them all, selecting the correct answer out of the four provided.**

|  |  |  |  |
| --- | --- | --- | --- |
| 1. | Which one of the following directly affects all persons working with electricity in a working environment? | | (L1.1) |
|  | a) | Electricity Safety, Quality and Continuity Regulations |  |
|  | b) | BS 7671 |  |
|  | **c)** | **Electricity at Work Regulations** |  |
|  | d) | Construction design and management Regulations |  |

|  |  |  |  |
| --- | --- | --- | --- |
| 2. | Which one of the following are non-statutory regulations? | | (L1.2) |
|  | a) | Electricity at Work Regulation |  |
|  | b) | Manual Handling Regulation |  |
|  | **c)** | **BS 7671** |  |
|  | d) | Provision and Use of Work Equipment Regulations |  |

|  |  |  |  |
| --- | --- | --- | --- |
| 3. | Which one of the following is a direct implication of not complying with statutory regulations? | | (L1.3) |
|  | a) | Loss of earnings |  |
|  | b) | Lost clients |  |
|  | c) | Dismissal |  |
|  | **d)** | **Prosecution** |  |

|  |  |  |  |
| --- | --- | --- | --- |
| 4. | The document showing the location of electrical equipment in an electrical installation is a: | | (L2.1) |
|  | a) | specification |  |
|  | **b)** | **drawing** |  |
|  | c) | variation order |  |
|  | d) | Gannt chart |  |

|  |  |  |  |
| --- | --- | --- | --- |
| 5. | Which one of the following diagram types does **not** show individual conductors or cables but shows the sequence of equipment? | | (L2.2) |
|  | **a)** | **Block** |  |
|  | b) | Circuit |  |
|  | c) | Schematic |  |
|  | d) | Bar chart |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 6. | The symbol shown represents: | | 06 Intermediate switch.png | (L2.3) |
|  | a) | one-way switch |  |
|  | b) | two-way switch |  |
|  | **c)** | **intermediate switch** |  |
|  | d) | pull switch |  |

|  |  |  |  |
| --- | --- | --- | --- |
| 7. | Which one of the following is the correct drawing scale where a wall, 4m in length, measures 8cm on a drawing? | | (L2.4) |
|  | **a)** | **1:50** |  |
|  | b) | 1:100 |  |
|  | c) | 1:200 |  |
|  | d) | 1:500 |  |

|  |  |  |  |
| --- | --- | --- | --- |
| 8. | A drawing is produced to a scale of 1:50 showing a socket outlet installed 3.5cm from the corner of a room. Which one of the following is the actual distance from the corner in the room? | | (L2.4) |
|  | a) | 0.875m |  |
|  | **b)** | **1.75m** |  |
|  | c) | 3.5m |  |
|  | d) | 7m |  |

|  |  |  |  |
| --- | --- | --- | --- |
| 9. | A circuit installed to supply a fire panel would be identified as: | | (L3.1) |
|  | a) | power and heating |  |
|  | b) | data communication |  |
|  | c) | control circuit |  |
|  | **d)** | **alarm and emergency system** |  |

|  |  |  |  |
| --- | --- | --- | --- |
| 10. | The type of trunking that can be used as a circuit protective conductor is: | | (L3.2) |
|  | a) | mini |  |
|  | b) | PVC dado |  |
|  | **c)** | **steel** |  |
|  | d) | plastic |  |

|  |  |  |  |
| --- | --- | --- | --- |
| 11. | The insulation material of mineral insulated metal sheathed cables is absorbent; therefore, the terminations must be: | | (L3.2) |
|  | **a)** | **watertight** |  |
|  | b) | correctly identified |  |
|  | c) | fitted with a gland |  |
|  | d) | fitted with a shroud |  |

|  |  |  |  |
| --- | --- | --- | --- |
| 12. | Additional cable supports should be provided in trunking where: | | (L3.2) |
|  | a) | segregation is required |  |
|  | **b)** | **there are long vertical runs** |  |
|  | c) | trunking is made of plastic |  |
|  | d) | the walls are made of lightweight block |  |

|  |  |  |  |
| --- | --- | --- | --- |
| 13. | Band I and Band II circuits can be enclosed in the same enclosure, provided that: | | (L3.2) |
|  | a) | the current rating of all circuits does not exceed 10A |  |
|  | b) | they are twisted around each other along the trunking length |  |
|  | **c)** | **every cable or conductor is insulated for the highest voltage present** |  |
|  | d) | there are the same number of Band I and Band II circuits |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 14. | Which one of the following is the type of conduit fixing shown? | | 14 Conduit Saddle.png | (L3.2) |
|  | a) | Cleat |  |
|  | b) | Clip |  |
|  | c) | Crampet |  |
|  | **d)** | **Saddle** |  |

|  |  |  |  |
| --- | --- | --- | --- |
| 15. | Which one of the following symbols represents the rating factor for thermal insulation? | | (L3.3) |
|  | **a)** | **Ci** |  |
|  | b) | Ca |  |
|  | c) | Cf |  |
|  | d) | Cg |  |

|  |  |  |  |
| --- | --- | --- | --- |
| 16. | Which one of the following is the value of voltage drop, per ampere, per metre, for a 10mm2 multi-core flat thermoplastic 70°C cable, intended to supply a single‑phase circuit? | | (L3.3) |
|  | a) | 44 mV/A/m |  |
|  | b) | 11 mV/A/m |  |
|  | **c)** | **4.4 mV/A/m** |  |
|  | d) | 2.8 mV/A/m |  |

|  |  |  |  |
| --- | --- | --- | --- |
| 17. | Which one of the following is the maximum current carrying capacity for a single‑core 6mm2 70°C thermoplastic insulated non‑armoured cable, enclosed in conduit on a wall installed for a single‑phase circuit? | | (L3.3) |
|  | a) | 31A |  |
|  | b) | 32A |  |
|  | c) | 36A |  |
|  | **d)** | **41A** |  |

|  |  |  |  |
| --- | --- | --- | --- |
| 18. | Which one of the following is the value of voltage drop, in millivolts per ampere per metre, for a 4mm2 multi‑core thermosetting non‑armoured cable, intended to supply a single‑phase circuit? | | (L3.3) |
|  | a) | 29 mV/A/m |  |
|  | b) | 18 mV/A/m |  |
|  | **c)** | **12 mV/A/m** |  |
|  | d) | 7.3 mV/A/m |  |

|  |  |  |  |
| --- | --- | --- | --- |
| 19. | Which one of the following devices is suitable for an installation supplying an X-ray machine in a hospital? | | (L3.4) |
|  | a) | BS 3036 rewireable fuse |  |
|  | **b)** | **BS EN 60898 Type D** |  |
|  | c) | BS EN 60898 Type C |  |
|  | d) | BS EN 60898 Type B |  |

|  |  |  |  |
| --- | --- | --- | --- |
| 20. | Which one of the following devices will disconnect in the fastest time if a short circuit current of approximately 400A occurred on a circuit? | | (L3.4) |
|  | a) | 32A/30mA Type C RCBO |  |
|  | **b)** | **32A Type B circuit breaker** |  |
|  | c) | 32A Type C circuit breaker |  |
|  | d) | 32A Type D circuit breaker |  |

|  |  |  |  |
| --- | --- | --- | --- |
| 21. | Which one of the following is the minimum conduit size suitable for a short straight run containing the following stranded cables:   * 4 x 1.5mm2 * 3 x 2.5mm2? | | (L3.6) |
|  | **a)** | **16mm** |  |
|  | b) | 20mm |  |
|  | c) | 25mm |  |
|  | d) | 32mm |  |

|  |  |  |  |
| --- | --- | --- | --- |
| 22. | Which one of the following is the minimum conduit size suitable for a short straight run containing the following stranded cables:   * 8 x 1.5mm2 * 2 x 2.5mm2 * 2 x 4.0mm2? | | (L3.6) |
|  | a) | 16mm |  |
|  | **b)** | **20mm** |  |
|  | c) | 25mm |  |
|  | d) | 32mm |  |

|  |  |  |  |
| --- | --- | --- | --- |
| 23. | Which one of the following is the conduit capacity factor to be used where a 25mm conduit has 2 bend in a 6m run? | | (L3.6) |
|  | a) | 111 |  |
|  | b) | 182 |  |
|  | **c)** | **333** |  |
|  | d) | 600 |  |

|  |  |  |  |
| --- | --- | --- | --- |
| 24. | The electrical system in which the connection to earth is by an earth electrode is: | | (L4.1) |
|  | **a)** | **TT** |  |
|  | b) | TN‑S |  |
|  | c) | TN‑C |  |
|  | d) | TN‑C‑S |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 25. | Which one of the following earthing arrangements is shown in the diagram? | | 25 TN-C-S.jpg | (L4.1) |
|  | a) | TN‑C‑S |  |
|  | b) | TT |  |
|  | c) | TN‑C |  |
|  | **d)** | **TN‑S** |  |

|  |  |  |  |
| --- | --- | --- | --- |
| 26. | Which one of the following is the correct name of the component which links the main earthing terminal of an installation to the means of earthing? | | (L4.2) |
|  | a) | Main protective bonding conductor |  |
|  | b) | Supplementary equipotential bond |  |
|  | **c)** | **Earthing conductor** |  |
|  | d) | Functional earth |  |

|  |  |  |  |
| --- | --- | --- | --- |
| 27. | What is represented by Zs in the following formula:  Zs=Ze+(R1+R2)? | | (L4.2) |
|  | **a)** | **Total earth fault loop impedance** |  |
|  | b) | External earth fault loop impedance |  |
|  | c) | Final circuit earth fault loop impedance |  |
|  | d) | Combined resistance of the earth path |  |

|  |  |  |  |
| --- | --- | --- | --- |
| 28. | Which one of the following defines the term ‘main protective bonding conductor’? | | (L4.2) |
|  | a) | The conductor which links the MET to an earth electrode |  |
|  | **b)** | **The conductor which links the MET to extraneous conductive parts** |  |
|  | c) | The conductor which links the MET to exposed conductive parts |  |
|  | d) | The conductor which links the MET to the means of earthing |  |

|  |  |  |  |
| --- | --- | --- | --- |
| 29. | Which one of the following is the purpose of the main protective bonding conductor? | | (L4.2) |
|  | a) | To raise extraneous conductive parts to the same voltage as the supply under overload |  |
|  | **b)** | **To raise extraneous conductive parts to the same voltage as the supply under earth fault conditions** |  |
|  | c) | To raise extraneous conductive parts to the same voltage as the supply under normal conditions |  |
|  | d) | To raise extraneous conductive parts to the same voltage as the supply under transient fault conditions |  |

|  |  |  |  |
| --- | --- | --- | --- |
| 30. | Which one of the following is an exposed conductive part? | | (L4.3) |
|  | **a)** | **Metal-clad switch** |  |
|  | b) | Structural steelwork |  |
|  | c) | Air conditioning ducting |  |
|  | d) | Metallic oil service pipe |  |

|  |  |  |  |
| --- | --- | --- | --- |
| 31. | Which one of the following is metal cable trunking? | | (L4.3) |
|  | a) | Earthed conductive part |  |
|  | b) | Extraneous conductive part |  |
|  | c) | Insulated part |  |
|  | **d)** | **Exposed conductive part** |  |

|  |  |  |  |
| --- | --- | --- | --- |
| 32. | Which one of the following is an extraneous conductive part? | | (L4.4) |
|  | **a)** | **Metallic gas service pipe** |  |
|  | b) | Metal-clad twin socket outlet |  |
|  | c) | Heavy duty steel conduit |  |
|  | d) | PVC mini-trunking |  |

|  |  |  |  |
| --- | --- | --- | --- |
| 33. | Which one of the following methods of generating electricity uses fossil fuels? | | (L5.1) |
|  | a) | Wave power |  |
|  | b) | Solar |  |
|  | **c)** | **Gas** |  |
|  | d) | Wind |  |

|  |  |  |  |
| --- | --- | --- | --- |
| 34. | Which one of the following uses sunlight to generate electricity? | | (L5.1) |
|  | **a)** | **Photo-voltaic** |  |
|  | b) | Biomass |  |
|  | c) | Wind |  |
|  | d) | Air source heat pump |  |

|  |  |  |  |
| --- | --- | --- | --- |
| 35. | Which one of the following is a transmission voltage? | | (L5.2) |
|  | **a)** | **400kV** |  |
|  | b) | 33kV |  |
|  | c) | 11kV |  |
|  | d) | 400V |  |

|  |  |  |  |
| --- | --- | --- | --- |
| 36. | Which one of the following is a typical distribution voltage for a medium-sized factory where a private sub‑station is located? | | (L5.3) |
|  | a) | 230V |  |
|  | b) | 400V |  |
|  | c) | 5kV |  |
|  | **d)** | **11kV** |  |

|  |  |  |  |
| --- | --- | --- | --- |
| 37. | In which of the following parts of the electrical distribution network would a step-down transformer be located? | | (L5.4) |
|  | a) | Power station |  |
|  | b) | Pylon |  |
|  | **c)** | **Local distribution sub‑station** |  |
|  | d) | Inverter |  |

|  |  |  |  |
| --- | --- | --- | --- |
| 38. | Which one of the following describes the process of a solar photo‑voltaic system? | | (L6.1) |
|  | a) | Solar power is used to ignite a biomass which heats up water |  |
|  | **b)** | **Solar power is collected by a solar panel which provides electricity** |  |
|  | c) | Solar power is collected by a solar panel which provides hot water |  |
|  | d) | Solar power causes hot air to rise, rotating a generator that produces electricity |  |

|  |  |  |  |
| --- | --- | --- | --- |
| 39. | Which one of the following is a suitable use for rainwater harvesting? | | (L6.1) |
|  | a) | Baths/showers |  |
|  | **b)** | **Toilet flushing** |  |
|  | c) | Drinking water |  |
|  | d) | Cooking water |  |

|  |  |  |  |
| --- | --- | --- | --- |
| 40. | Which one of the following micro-generation systems requires the least maintenance once installed? | | (L6.3) |
|  | a) | Micro-combined heat and power |  |
|  | b) | Air source heat pump |  |
|  | c) | Biomass |  |
|  | **d)** | **Solar thermal** |  |