

2400 Design Erection & Verification.

Question 1. Please answer neatly below the question & on additional sheet if needed...

You are called to a Public House where a circuit containing six 70watt & three 85Watt SON-T light fittings has ceased to function.

You inspect the circuit and find it is wired in 1mm 3-core PVC/SWA cable, clipped direct to the outside wall. The fuse at the DB is of a fairly old type (Wylex Re-wirable BS3036) which has been rated at 5Amps.

The distance from the DB to the furthest fitting is 27m, and Ze is recorded at 0.21Ω.

- i) Determine if the cable being used would be deemed sufficient.
- ii) Determine if the Zs at the furthest point complies with BS7671 after the Rule of thumb has been applied.
- iii) Determine if the Earth conductor currently being used is large enough.
- iv) Explain which document you would complete at this stage & any (short) comments you might enter onto it if any of the above is seen not to comply.

(10 Marks)

Question 2. Please answer the question neatly below & on additional sheet if needed...

You may use BS7671:2001, The On Site Guide &/or the IEE Guidance Notes 3.

- a) Describe One Method suitable for the verification of CPC Continuity for a Radial Circuit which is 35m long, wired in 6mm single core thermoplastic (pvc)-insulated cable (non-armoured) installed in a conduit together with a 1.5mm cpc. (2 Marks)
- b) Indicate the acceptable cpc resistance value for the above circuit. (3 Marks)
- c) If the method described for (b) incorporated the use of the phase conductor, explain
 - i) What the test instrument reading indicates
 - ii) Where this reading may come into use in further tests being carried out, and why the ambient temperature at the time of the test is important to note. (3 Marks)
- d) If the conduit were to be used in place of the copper cpc and there was some doubt as to the suitability of this, explain what test instrument would be used to verify the conduits continuity. (2 Marks)

Question 3. Please answer the question neatly below & on additional sheet if needed...

You may use BS7671:2001, The On Site Guide &/or the IEE Guidance Notes 3.

A bus depot compound has workshops and garages which hold a high pressure washing / valeting provision for the vehicles. Explain the design criteria for this area with regard to EACH of the following:

- a) Access to road lighting (3 Marks)
- b) Security lighting for the entire compound (2 Marks)
- c) Electrical Services in the individual workshops (3 Marks)
- d) Electrical Services within the area that washing & valeting takes place (2 Marks)

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Question 4. Please answer the question neatly below & on additional sheet if needed...
You may use BS7671:2001, The On Site Guide &/or the IEE Guidance Notes 3.

A large 'Country Pub' is to have the entire exterior floodlit by 25 x 350 Watt high-pressure Sodium (SON) floodlights. These are to be mounted on a perimeter wall surrounding the building at a level of 1m from f.f.l. & some 10 meters from the perimeter of the main structure. If the supply is 400V, 50Hz, Three phase & neutral, forming part of a TNC-S system, and the exterior walls of the building to be lit measure 40 m x 30 m, without showing regard for detailed lighting design.

- a) Indicate how the lighting may be distributed around the building perimeter. **(2 Marks)**
- b) With reference to maintainability, state a suitable wiring system and method of installation. **(3 Marks)**
- c) Detail the switching & control equipment that would be employed, presuming contactors are to be used to bring the lighting on in three stages. **(5 Marks)**

Question 5. Please answer the question neatly below & on additional sheet if needed...
You may use BS7671:2001, The On Site Guide &/or the IEE Guidance Notes 3.

A Laboratory, used for the repair of IT & telecommunication equipment along with the repair of VDU's and TV receivers, has bench supplies at 230V, 50Hz, using an isolating transformer to provide protection by '*Electrical Separation*'. Detail 5 design criteria in order for this installation to comply fully with BS7671:2001.

(10 Marks)

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