

A small, light industrial factory engaged in dry powder coating of metal components is to have a periodic inspection and test for insurance purposes.

The Wiring system is formed by steel trunking and conduit with associated single core p. v.c. insulated copper conductors (phase, neutral and c.p.c.). All protective devices are BS 88 part II fuses.

The powder coating process involves immersion of the metal items in an acid bath to remove grease etc, coating them with a spray of dry powder (Electrostatic), and then running them through a gas-fired tunnel oven on an overhead continuous conveyor system.

The lighting in the main factory area is provided by high bay SON lamps, on a plug and socket system.

The office accommodation comprises a main office area and male and female toilets. The wiring system for this area is p.v.c./p.v.c. twin and c.p.c., the socket outlets being fed in the form of a ring final circuit. .

The earthing system is T.N-C-S.

21 State the documentation that

- a) i) would be useful to have available before commencing the inspection and testing process
- ii) will need to be completed. (5 marks)

State the

- b) TWO statutory Regulations that apply to the periodic inspection and testing procedure (6 marks)
- c) action to be taken if no documentation regarding the installation was available. (4marks)

22 The installation as been in existence for fifteen years. list FIVE particular areas of inspection, apart from general wear and tear, that should be considered. (15 marks)

23 The method of protection against indirect contact for this installation is by EEBADS . List in sequence, the tests that would need to be carried out. (15 marks)

24 Describe how a ring final circuit continuity test would be carried out for the office area. Indicate which result would be recorded on a test schedule. (15 marks)

25 Draw a labelled diagram of the earth fault loop path associated with any ONE of the circuits in this installation. (15 marks)

26 An earth fault loop impedance test on a 50 A compressor circuit gives a result of 0.93 ohms.

The result of a previous c.p.c. continuity test for this circuit gives $(R_1 + R_2)$ as 0.47 ohms.

The ambient temperature at the time of the test was 25°C (factor 0.98) and the cable is 70°C p. v.c. (factor 1.2).

If the maximum tabulated value of Z_s for this circuit is 1.09 ohms, show by calculation (not the rule of thumb method) if the measured value of Z_s is acceptable.

(15 marks)