P1 Nov 09

QUESTION 1: GENERAL

1.1 What duties are unique to a Master Installation Electrician according to the OHS Act, 1993 (Act 85 of 1993)? (2)

1.2 What criteria should a person comply with according to the Chief Inspector before he/she could be registered as an accredited Master Installation Electrician? (4)

1.3 For how long is an accredited person's status valid? (2)

1.4 Can a company apply to be registered as an accredited Master Installation electrician? (2)

1.5 Can a person be registered as an accredited Master Installation Electrician without being an electrical contractor or an electrical consultant or electrical engineer? (2)
[12]

QUESTION 2: SANS 10142 PART 1 2003

The wiring of premises (Low voltage installations)

SCOPE

This part of SANS 10142 (SABS 0142) covers:

2.1 Circuits supplied at nominal voltages up to and including (2.1.1) V ac or (2.1.2) V dc. The standard frequency for ac. is (2.1.3) Hz. The use of other frequencies for special purposes is not excluded, Amdt 3 (1) (1) (1)

2.2 State FIVE aspects/parts of an electrical installations which are covered by this standard (5)

MEDICAL LOCATIONS

2.3 Define the following terms as used in medical locations:

2.3.1 group 0 location (1)
2.3.2 group 1 location (2)
2.3.3 group 2 location (2)
[13]

PTO

P1 Nov 09

QUESTION 3: ELECTRICITY SUPPLY SYSTEM

3.1 Select from the group below the description best describing the different electrical supply system. Write only the corresponding letter (A – C) next to the question number (3.1.1 – 3.1.3) in the ANSWER BOOK.

3.1.1 IT supply system (1)
3.1.2 TNS supply system (1)
3.1.3 TN - C supply system (1)

ANNEXE M.

A All exposed conductive parts of a consumer's installation are connected to a consumer's earth electrode which is electrically independent of the source earth.

B The source of energy is either connected to earth through a deliberate introduced high earthing impedance or it is isolated from earth (typically more than 1 000 Ω). All exposed conductive parts of a consumer's installation are connected to an earth electrode.

C The protective conductor (PE), which is connected to the source earth, is either a separate conductor or the armour of the cable if the resistance of the armouring is such that the earth fault loop impedance complies with the requirements OF 8.7.5 thereof. All exposed conductive parts of a consumer's installation are connected to this protective conductor via the supply earth terminal. **[3]**

QUESTION 4: SANS 10108

The classification of hazardous locations and the selection of apparatus for use in such locations.

4.1 A hazardous location classification study should only be undertaken once all relevant information is known. Describe FIVE different categories of information which is needed. (5)

4.2 The classification of locations where a flammable gas or vapour atmospheres could be present comprises of a few basic steps. Name these steps that should be followed. (5)

4.3 When the classification of atmospheres containing flammable/combustible dust is done, there are a number of factors pertaining to the dust that would influence the classification. Name TWO of these factors. (2)

4.4 Name TWO other standards that should primarily be used with SANS 10108 for classification of both atmospheres containing flammable dust or vapours and gasses. (2)

P1 Nov 09

4.5 Give FOUR examples (not definitions) of areas containing flammable atmospheres that would fall under the following area classification categories:

4.5.1 Zone 0 (4)
4.5.2 Zone 2 (4)
4.5.3 Zone 21 (4)

4.6 The direct example method of area classification applies to three types of process/activity areas according to this standard. List these areas. (3)
[29]

QUESTION 5: SANS 60079 PART 0 2005

Electrical apparatus for explosive gas atmospheres.

Part 0: General requirements.

5.1 Define the scope of this standard. (3)

5.2 Flammable gasses and vapours are divided into different classes and subclasses. Name these different classes and sub classes. (5)
[8]

QUESTION 6: SANS 60079 PART 10 2005

Electrical apparatus for explosive gas atmospheres. Part 10: Classification of hazardous areas.

6.1 State the THREE grades of release as mentioned in this standard. (3)

6.2 Explain the meaning of *LEL (Lower Explosive Limit)* and *UEL (Upper Explosive Limit)*. (2)

6.3 Explain the principle *relative density of a gas* or *vapour*. (2)
[7]

P1 Nov 09

QUESTION 7: SABS-IEC 61241 PART 3 1997

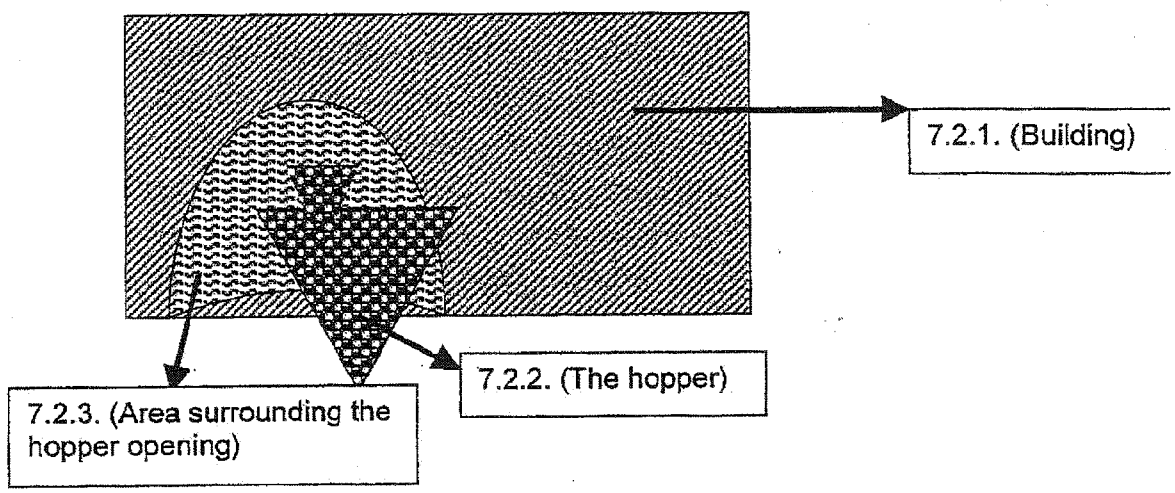
Electrical apparatus for use in the presence of combustible dust. Part 3: Classification of areas where combustible dusts are or may be present.

7.1 According to this standard there are four principles to be followed when the classification for hazardous areas containing combustible dust is done. List these FOUR principles. (4)

7.2 Bag emptying station without exhaust ventilation within a building.

In this example bags are manually emptied frequently into a hopper from which the contents are conveyed pneumatically into some other part of the plant. Part of the hopper is always filled with product.

Provide the area classification for areas (7.2.1 – 7.2.3) and explain why you have allocated the particular classification (zone) to the area.



(6)
[10]

P1 Nov 09

QUESTION 8: SABS 0123

The control of undesirable static electricity.

8.1 Provide a short explanation on how static electricity is generated between materials with different work functions. (2)

8.2 State the basic control methods for the prevention of static electricity build-up that could cause ignition of a flammable atmosphere if discharged, in the following cases:

8.2.1 Mobile apparatus such as trolleys (2)
8.2.2 Rotating shafts (2)
8.2.3 Non-conductive objects (2)
[8]

QUESTION 9: APPLICATION

The following list contains industries that have process areas in their respective production facilities that contain possible flammable atmospheres. List TWO of the areas for each industry. Your description of the areas should be clear enough for a person not familiar with the processes to understand why the areas are considered to be flammable atmospheres.

NOTE: For the purpose of this question flammable stores (oil and paint) are not considered part of the production processes.

9.1 Grain storage facilities (2)

9.2 Ink manufacturing plants (2)

9.3 Coach building areas (2)

9.4 Steel manufacturing plants (2)

9.5 Motor vehicle service areas (2)
[10]

TOTAL: 100