MIE P2 Apr 09

QUESTION 1: GENERAL

The terms below, are used when risk profiles for explosive atmospheres are considered. Give a brief explanation for each of the following:

1.1	Ignition temperature of a flammable liquid	(3)
1.2	Upper explosive limit (UEL) of a gas/vapour	(3)
1.3	Lower explosive limit (LEL) of a gas/vapour	(3)
1.4	Flash point of a gas/vapour	(3)
1.5	Relative density of a gas/vapour	(3)
1.6	Dust explosion pentagon	(5)
		[20]

QUESTION 2: OCCUPATIONAL HEALTH AND SAFETY ACT, 1993 (ACT 85 OF 1993)

2.1	Which Act of 1985 was incorporated into the OHS Act, 1993 (Act 85 of 1993)?	(1)
2.2	Jurisdiction of the OHS Act presides with which government department?	(1)
2.3	The chief inspector of Occupational Health and Safety is responsible to ensure that all places of employment comply with the requirements in the act as far as a safe working environment is concerned. This includes underground mine activities. Is this statement TRUE or FALSE?	(1)
2.4	What does the abbreviation GME, which sometimes appear on explosion-protected equipment, represents?	(1)
2.5	Name TWO regulations incorporated in the OHS Act which form an integral part of Specialised Electrical Installations.	(1)
		[5]

QUESTION 3: SANS 10142 PART 1 2003

The wiring of premises (Low voltage installations)

3.1 Certificate of Compliance (CoC)

3.1.1 According to the standard, how long is a Certificate of Compliance valid for? (2)

3.1.2 A qualified engineer with five years experience in petrochemical engineering may issue a Certificate of Compliance for a Specialised Electrical Installation without being accredited by the Department of Labour as a Master Installation Electrician. Is this statement TRUE or FALSE? (1)

3.1.3 Name any FOUR documents you will have to add to a Certificate of Compliance for a Specialised Electrical Installation as called for on the Certificate itself. (4)

3.2 Additional Certificate of Compliance for a medical location

3.2.1 Name the standard that previously dealt with the wiring requirements in medical locations. Reference to this standard is still frequently found in hospitals. Also state which standard has replaced the PREVIOUS ONE. (2)

3.2.2 Which TWO aspects require special attention when evaluating a Specialised Electrical Installation in a medical location? (2)

3.3 Additional Certificate of Compliance for a hazardous location

3.3.1 A Certificate of Compliance can be issued for an electrical installation in potentially hazardous locations which have not been zoned (classified) yet. Is this statement TRUE or FALSE? (1)

3.3.2 Any change or alteration to the production process that influences the classification of the hazardous location does not effect the electrical Certificate of Compliance for the particular installation. Is this statement TRUE or FALSE? (1)

3.3.3 Who may classify an area containing a flammable atmosphere according to its risk profile into different zones? (1)
[14]

MIE P2 Apr 09

QUESTION 4: SANS 10086 PART 1 2003

The installation, inspection and maintenance of equipment used in explosive atmospheres. Part 1: Installations including surface installation on mines.

4.1 The scope of any standard gives information regarding the contents of the standard. Give the scope of this standard. (5)

4.2 When selecting apparatus for use in explosive/flammable atmospheres information is required. Give relevant information using the following headings:

4.2.1 Ignition temperature of the explosive atmosphere (4)

4.2.2 Gas or vapour groups/class (3)

4.2.3 External atmospheric influences (2)

4.2.4 Ambient temperatures (2)

4.2.5 Hazardous area zones (3)

4.2.6 Ventilation (2)

4.3 State the requirements regarding instantaneous earth fault protection required in zones 1 and 2. (2)

4.4 State the requirements regarding potential equalisation as specified by this standard in as far as:

4.4.1 All exposed and extraneous conductive parts (3)

4.4.2 Flanged joints on long runs of piping carrying flammable substances (2)

4.4.3 Conduits, wireways, pipelines and steel structures (2)

4.5 Cathodic protection is regularly used in areas containing piping and other associated equipment carrying flammable substances to prevent corrosion. Briefly explain this protection principle. (5)
[35]

QUESTION 5: SABS 089 PART 2

The petroleum industry: Part 2: Electrical installations in the distribution and marketing sector

5.1 Explain the difference between a flammable liquid and combustible liquid as defined in this standard. (6)

5.2 The standard also makes reference to grades of release of flammable liquids, vapours and gasses. Define the following sub-categories of release:

5.2.1 Primary release (3)
5.2.2 Secondary release (3)

5.3 Static electricity as well as stray currents is a high risk aspect in the petrochemical industry. Explain how this could be controlled in the following circumstances:

5.3.1 Static electricity generated by filters and strainers (3)

5.3.2 Railway sidings used for bulk loading and off-loading of flammable substances. (3)

5.3.3 Switch loading of class 1, class 2 and class 3 product (3)

5.3.4 The filling of small portable containers (3)

5.3.5 Hand-operated drum pumps (3)

5.3.6 Containers used for transporting class 1 products (3)
[30]

TOTAL: 100