 

***ASSIGNMENT 3***

SUBJECT: **Occupational Health** and **Safety**

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SECTION/COURSE: *BESE 27-C*

SUBMISSION DATE: 09.6.2022

**Question# 1:**

*What is environmental monitoring?*

***Answer:***

Environmental monitoring involves the assessment of the quality of the environment in order to control the risk of pollution.

It is used as the basis of the production of environmental impact assessments. This information is then used to study environmental trends and to quantify the current state of the environment.

Assessments through environmental monitoring are subject to statistical analysis. Environmental monitoring utilizes specialized equipment and specific monitoring methods to get the most accurate recording of pollutant levels. Environmental monitoring allows pollution levels to be controlled and trends to be identified.

Environmental monitoring takes the form of air, soil, and water monitoring.

**Air Monitoring:**

Air monitors are used to identify the air quality and the levels of pollution.

**Soil Monitoring:**

Soil monitoring requires the collection of soil samples to be analyzed and tested in a laboratory setting. This may be by way of grab sampling or composite sampling.

**Water Monitoring:**

Water monitoring may take the form of chemical, biological, radiological, or microbiological testing.

**Noise Monitoring:**

Noise can be monitored both for sea life and on land. In the sea, cetaceans use noises as we use our eyes. For example, if there is too much noise pollution whales cannot communicate which puts them in danger. On land, noise can disrupt wildlife’s natural habitats and the quality of life for humans.

**Question# 2:**

What does biological and medical monitoring measure?

**Answer:**

**Biological Monitoring:**

Biological monitoring (biomonitoring) in occupational safety and health is the detection of substances (biomarkers) in biological samples of workers, compared to reference values. This article is limited to chemical exposures. Biomonitoring can help in exposure assessment of speciﬁc chemicals, characterisation of exposure pathways and potential risks. Biomarkers can detect the exposure, the effect, or reveal susceptibility. Biomonitoring may be interpreted at group or individual level. Most common media are urine and blood.

A biomarker can be any substance, structure or process that can be monitored in tissues or fluids and that predicts or influences health, or assesses the incidence or biological behaviour of a disease . Biomarkers are early (reversible) signs of exposure, effect or susceptibility with possible adverse health outcome. Biomarkers are classified into three categories depending on their use or the speciﬁc context in which the test is being used.

**Biomarker of exposure:**

It is the substance, or its metabolite, or the product of an interaction that is measured in a compartment or a bodily ﬂuid. Biomarkers of exposure identify and measure chemical residues in tissue or body fluids, metabolites of xenobiotic compounds, or physiological outcomes that occur as a result of exposure. For example lead in blood may fairly represent the recent lead exposure of the individual.

**Biomarker of effect:**

It is a measurable alteration (biochemical, structural, functional, behavioural, etc.) in an organism that can be associated with an established or potential health impairment or disease. Biomarkers of early disease indicate early biochemical or functional alterations, ranging from natural adaptation to disease. For example the value of Zinc protoporphyrin in blood is increased when lead exposure caused changes in the production of haemoglobin.

**Medical Monitoring:**

It means the performance of medical tests and physical exams to evaluate an individual's on-going exposure to a factor that could negatively impact that person's health. "Medical monitoring" includes close surveillance or supervision of patients liable to suffer deterioration in physical or mental health and checks of various parameters such as pulse rate, temperature, respiration rate, the condition of the pupils, the level of consciousness and awareness, the degree of appreciation of pain, and blood gas concentrations such as oxygen and carbon dioxide.

Risks in such devices is verification of their behavior against the patient's requirements. The high-level requirements need to be satisfied by the device are as follows:

* Available dose injection when required
* Delivering the correct dose
* Not delivering the unnecessary INS
* The device sensor should not be late/early for sampling
* The blood glucose should never move downward/upwards safe-min/safe-max.

**Question# 3:**

***How can medical tests for toxic substances be useful?***

***Answer:***

**Toxicology test** :

Any of a group of laboratory analyses that are used to determine the presence of poisons and other potentially toxic agents in blood, urine, or other bodily substances. Toxicology is the study of poisons—their action, their detection, and the treatment of conditions they produce.

The main advantage of toxicity testing is that it detects toxic compounds based on their biological activity, and as such does not require a prior knowledge of the toxicant to identify its presence (unlike chemical analysis). A single toxicology screen may test for as many as 30 agents at one time.

 A toxicity test, by extension, is designed to generate data concerning the adverse effects of a substance on human or animal health, or the environment. Many toxicity tests examine specific types of adverse effects, known as endpoints, such as eye irritation or cancer. Other tests are more general in nature, ranging from acute (single-exposure) studies to repeat dose (multiple-exposure) studies, in which animals are administered daily doses of a test substance.