

2528/202  
2922/202  
ENVIRONMENTAL POLLUTION  
CONTROL, HEALTH AND SAFETY  
Oct./Nov. 2019  
Time: 3 hours



**THE KENYA NATIONAL EXAMINATIONS COUNCIL**

**DIPLOMA IN ENVIRONMENTAL SCIENCE AND TECHNOLOGY**

**MODULE II**

**ENVIRONMENTAL POLLUTION CONTROL, HEALTH AND SAFETY**

**3 hours**

**INSTRUCTIONS TO CANDIDATES**

*You should have an answer booklet for this examination.*

*This paper consists of **TWO** sections: **A** and **B**.*

*Answer **ALL** the questions in section **A** and any **THREE** questions from section **B** in the answer booklet provided.*

*Each question in section **A** carries 4 marks which each question in section **B** carries 20 marks.*

*Maximum marks for each part of a question are as indicated.*

*Candidates should answer the questions in **English**.*

**This paper consists of 4 printed pages.**

**Candidates should check the question paper to ascertain that all the pages are printed as indicated and that no questions are missing.**



**SECTION A (40 marks)**

*Answer ALL questions in this section.*

1. Explain the formation of each the following pollutants in the atmosphere:
  - (a) condensation aerosol; (2 marks)
  - (b) dispersion aerosol. (2 marks)
2. (a) Define the term 'biogenic hydrocarbons'. (1 mark)  
(b) Name **three** biogenic hydrocarbons. (3 marks)
3. (a) Draw the chemical structure of styrene. (1 mark)  
(b) Name **three** anthropogenic sources of alkenes. (3 marks)
4. State **four** negative effects of cadmium on human health. (4 marks)
5. Write the chemical equations describing oxygen consumption in water by the following processes:
  - (a) oxidation of organic matter; (2 marks)
  - (b) biooxidation of nitrogenous material. (2 marks)
6. State **four** reasons for conducting a proper investigation of an accident in a workplace. (4 marks)
7. Distinguish between a safety engineer and a safety manager. (4 marks)
8. Classify any **four** categories of substances that are hazardous to human health. (4 marks)
9. (a) Define the term ergonomics. (1 mark)  
(b) State any **three** factors to be considered to create a good ergonomic work environment. (3 marks)
10. State **four** responsibilities of a fire watch officer in an organisation. (4 marks)



**SECTION B (60 marks)**

Answer any **THREE** questions from this section.

11. (a) Describe **three** sources of carbonmonoxide in the atmosphere. (6 marks)
- (b) Explain **two** measures taken to control carbonmonoxide in internal combustion engines. (4 marks)
- (c) Using chemical equations, outline the elimination of carbonmonoxide with regeneration of hydroxyl radical in the atmosphere. (6 marks)
- (d) State **four** ways in which sulphurdioxide reacts in the atmosphere. (4 marks)
12. (a) Draw the chemical structure of dichlorodiflouromethane. (2 marks)
- (b) State **two** uses of chloroflourocarbons. (2 marks)
- (c) With the aid of chemical equations, outline the depletion of ozone layer by dichlorodifluoromethane. (7 marks)
- (d) (i) Explain how internal combustion engines contribute to smog formation. (5 marks)
- (ii) State **four** effects of photochemical smog. (4 marks)
13. (a) State **four** consequences of frequent occupational accidents in an organisation. (4 marks)
- (b) Explain **four** responsibilities of employers to workers exposed to occupational hazards. (8 marks)
- (c) Describe **four** engineering control methods to ensure a safe work environment. (8 marks)
14. (a) State any **four** activities of a health and safety committee in a waste water treatment facility. (4 marks)
- (b) Explain **five** responsibilities of workers in ensuring safety in a processing plant. (10 marks)
- (c) State any **six** rights of health and safety representatives in an organisation. (6 marks)

15. (a) Define 'hazardous material'. (2 marks)
- (b) Name four entry routes of hazardous materials into a human body. (4 marks)
- (c) List any six preventive measures taken to protect employees against dust in a factory. (6 marks)
- (d) Explain four factors that contribute to accidents in a work place. (8 marks)

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