



**UNIVERSITY OF MINES AND TECHNOLOGY, TARKWA**  
**FIRST SEMESTER EXAMINATIONS, NOV/DEC 2018**

**COURSE NO:** 171

**COURSE NAME:** PRINCIPLES OF ENVIRONMENTAL ENGINEERING

**CLASS:** ES 1

**TIME:** 3 HRS

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Name: \_\_\_\_\_ Index Number: \_\_\_\_\_

**Section A (50 marks)**

**Answer All Questions** (Select the best option)

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1. What name is given to the outermost layer of the atmosphere?

- |                 |                |
|-----------------|----------------|
| a. Thermosphere | c. Exopause    |
| b. Exosphere    | d. Thermopause |

2. ....is/are considered among the earth's main components.

- I.** Hydrosphere
- II.** Atmosphere
- III.** Ecosphere
- IV.** Lithosphere

- |                          |                              |
|--------------------------|------------------------------|
| a. <b>II</b> only        | c. <b>I, II and III</b> only |
| b. <b>I, II, III, IV</b> | d. <b>I, II and IV</b> only  |

3. These are all physical factors that affect the environment except

- a. Sunlight

- b. Gases
  - c. Water
  - d. Soil
4. .... form only about 4% to 6% of the lithosphere
- a. Organic materials and water
  - b. The crust
  - c. Organic materials
  - d. Water
5. Which one is the odd one in the list below
- a. Lithosphere/Ecosphere (Land)
  - b. Hydrosphere (Water)
  - c. Atmosphere (Air)
  - d. Biosphere (Living things)
6. The earth's crust consists of.....?
- a. Water, mantle and soil
  - b. Water and rocks
  - c. Mantle, outer and inner cores
  - d. Rocks and soil
7. Understanding the earth's environment is essentially for.....
- a. Dealing with the anthropogenic impacts on the environment
  - b. Reducing the effects of natural hazards
  - c. Location of basic resources
  - d. All of the above
8. Which is the odd one among the list below
- a. To determine the ineffectiveness of the noise control procedure.
  - b. To determine compliance with noise regulations.

- c. To locate the source (or sources) of noise in a piece of machinery.
- d. None of the above is odd

9. Which of these is considered a greenhouse gas?

- e. Nitrogen
- f. Chlorine
- g. Carbon
- h. water vapour

10. EIA is an environmental management tool which stands for.....

- a. Environmental Institution and Authority
- b. Environmental Assessment
- c. Environmental Accessories
- d. Environmental Assessment
- e. Impact
- f. Impact

11. The following are common types of Fog except?

- a. Dim fog
- b. Evaporation fog
- c. Upslope fog
- d. Ground fog

12. The “ozone layer” is a layer in the atmosphere with higher concentrations of.....gas.

- a. O<sub>3</sub>
- b. CO<sub>2</sub>
- c. SO<sub>3</sub>
- d. CH<sub>4</sub>

13. Integrated solid waste management include all but

- a. Landfilling
- b. Source reduction
- c. Waste construction and demolition
- d. Waste transformation

**14. Environmental ethics is the study of moral issues and decisions facing.....**

- a. Humans
- b. Ecosystems

- c. Biomes
- d. Culture

15. .... is the most dynamic and changeable component among the earth's spheres

- a. Lithosphere
- b. Ecosphere

- c. Atmosphere
- d. Hydrosphere

16. What does the ozone do?

- a. It protects us from meteors
- b. It protects us from violent solar flares

- c. It protects us from UV radiation
- d. It helps us breathe

17. What is the linkage between "Environment and Social" called in sustainable development?

- a. Sociable
- b. Viable

- c. Bearable
- d. Equitable

18. Environmental ethics refers to the study of the moral relations between mankind and their \_\_\_\_\_.

- a. Anthropogenic environment
- b. Natural environment

- c. Biotic environment
- d. Man-made environment

19. Which of the following is not an effect of a depleted ozone layer?

- a. Increased crop yields
- b. Damage to plants and animals

- c. Reduction of polar ice cap
- d. Environmental depletion

20. The following are Impacts of Air Pollution except:

- a. Ozone can have detrimental effects on human health, wildlife and vegetation. E.g., Asthma may be triggered by air pollution.
- b. SO<sub>2</sub> and NO<sub>x</sub> cause acid rain.
- c. Since most of us spend up to 90% of the time indoors, indoor air quality could have a real bearing on our health.
- d. The formation of smog has a little impact on the environment.

21. The following are Impacts of Water Pollution except:

- a. Waterborne infectious diseases like typhoid, dysentery, cholera etc. are caused by consuming contaminated water.
- b. Excess amounts of fluoride in drinking water causes fluorosis, a disease of the teeth and bones.
- c. Effluents from industries like paper mills, tanneries, dairies, breweries, slaughterhouses and municipal sewerage are contaminated with inorganic pollutants, which reduce the carbon dioxide levels in the water killing aquatic organisms.
- d. Agricultural runoffs pollute water with plant nutrients like Phosphates, Nitrates and Pesticides. The plant nutrients promote wild growth of oxygen-consuming algae leading to the destruction of aquatic life. Pesticides are toxic to humans, and animal life.

22. **EIA is defined as:**

- a. A process of identifying, predicting, and evaluating the likely impacts of a proposed project or development to define mitigation actions to reduce negative impacts and to provide positive contributions to the natural environment and well-being
- b. A report written by government representatives on the planned development impacts of environment, socio-economic issues and culture
- c. Project life-cycle assessment

23. **Other assessments similar to EIA include**

- a. SEA – strategic environmental assessment
- b. SIA – strategic impact assessment
- c. IEA – integrated environmental assessment
- d. ISA- impact strategic assessment

**24. What is the odd purpose of the “screening” step of EIA?**

- a. To determine whether a full EIA needed
- b. To assess the quality of the project design
- c. To facilitate informed decision making by providing

clear, well-structured, factual analysis of the effects and consequences of proposed actions.

**25. Which type of project is a schedule 2 project?**

- a. Small housing building
- b. Dams and reservoirs
- c. Reclamation, resettlement and new land development

- d. Mining and mineral development (including oil and gas)

**26. What is false of the Scoping step?**

- a. It is a systematic exercise that establishes the boundaries of an EIA
- b. It clearly indicates what is relevant and what is not relevant within an EIA

- c. It serves as a work plan for the entire EIA process
- d. Scoping helps in the writing of the screening report for decision making

**27. Which term is best described as the responsible interaction with the environment to avoid depletion or degradation of natural resources and allow for long-term environmental quality?**

- a. Environmental stability
- b. Environmental sustainability
- c. Environmental ethics
- d. Environmental justice

28. A new city is built in an area with a large lake. The city primarily uses the lake as a major water supply for a variety of different city needs. This becomes a concern for environmentalists. Why are they concerned?

- a. Water is a renewable natural resource, but if they use it too fast, nature won't keep up.

- b. Water is a non-renewable natural resource, so their supply is limited.
  - c. This kind of large-scale use of a water supply leads to increased greenhouse gasses.
  - d. This kind of a large-scale use of a water supply leads to increased soil erosion.
29. The stratopause is the transition layer between the troposphere and the stratosphere. **True or False**
30. The earth's environment consists of five (5) major spheres: Lithosphere, Hydrosphere, Stratosphere, Biosphere and Atmosphere. **True or false**
31. Asthenosphere is part of the Lithosphere. **True or False**
32. Solid wastes are defined as unwanted materials that are no longer of value to us. **True or false**
33. Algal blooms are not an indication of eutrophication of a water body. **True or false**
34. The water locked up in the Oceans and Seas is too salty and can be used directly for human consumption, domestic, agriculture or industrial purposes. Less than 1% of water resources are available for human exploitation. **True or False**

35. The natural environmental impacts are preventable and on many occasions predictable and anthropogenic detrimental impacts on environment are eminently preventable but only with a focused global effort. **True or false**
36. Public consultation is a critical part of the EIA, and in Ghana it is mandated by legislation. **True or False**
37. The ionosphere is not really a layer, but rather an electrified region within the upper atmosphere where fairly large concentrations of ions and free electrons exist. **True or False**
38. The area where atoms and molecules shoot off into space (represents the upper limit of our atmosphere) is called the exosphere. **True or False**
39. The hydrosphere (water sphere) comprises all the water present in the oceans, seas, rivers, lakes except glaciers or snowcaps, water in the soil, rocks and in the air. **True or false**
40. Biosphere also referred to as the Ecosphere ("eco" meaning home) is the totality of life and life support systems. **True or False**
41. Torrential rain produced by thunderstorms is usually intense with a long duration of rain fall. **True or false**
42. Impact assessment is done for the planned project and the identified alternatives. **True or False**

43. The types of floods include ....., ..... and ..... floods.
44. From the perspective of groundwater and surface water contamination, the most significant contaminant characteristic is .....
45. The damage to the environment is caused both by natural and man-made factors. The natural impacts are ..... and on many occasions ..... However, knowledge of natural hazards is essential in order to take actions to ..... the loss of life and property. On the other hand, anthropogenic detrimental impacts on environment are eminently ..... but only with a focused global effort.
46. Noise may be from a point source and an example is ....., a line source and an example is ..... And an area source and an example is .....

**ANSWER QUESTION ONE (1) AS A COMPULSORY QUESTION AND ANY OTHER TWO (2)**

**Question One [Total of 10 Marks]**

Briefly write on any 5 of the following linking them to tell a good story.

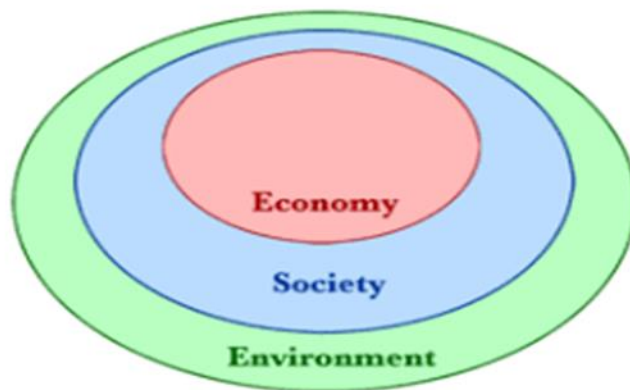
1. Environment
2. Earth's Environment
3. Environmental Impact
4. Environmental Impact Assessment
5. Sustainable Development
6. Environmental Ethics
7. Solid Waste Management

**Question Two [Total of 20 Marks]**

- a. What is the difference between the following:

A hazard and risk, natural hazard and natural disaster, plate tectonic and tectonic plate, foreshock, mainshock and aftershock, advection, evaporative, radiation and upslope fog. **(8 Marks)**

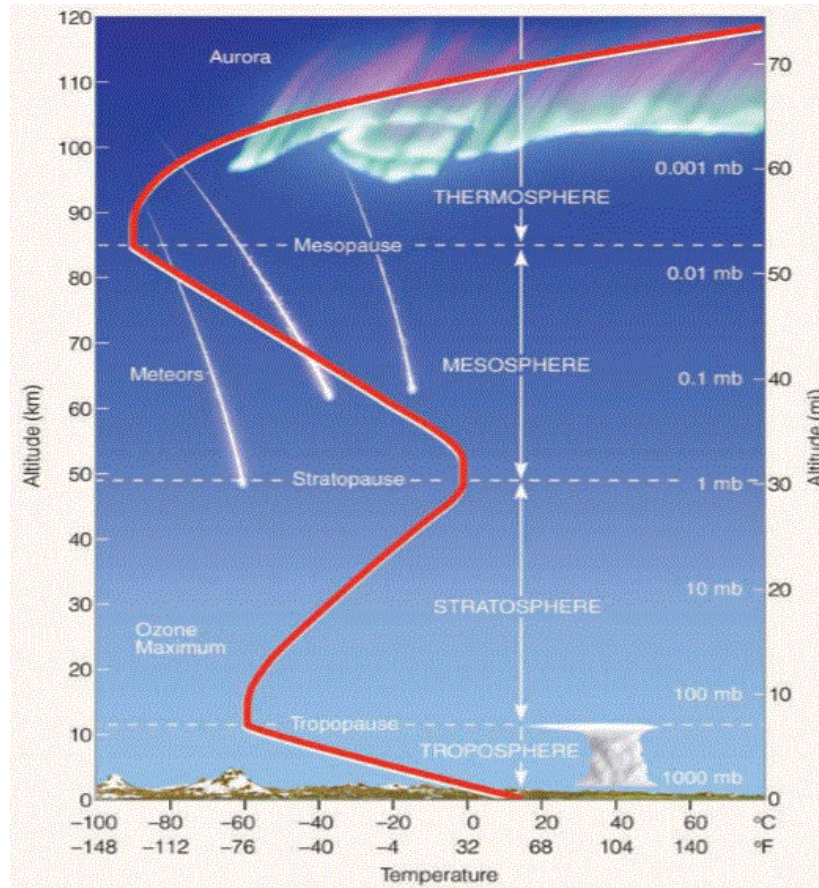
- b. Define sustainable development. And also what is the relationship between the three pillars of sustainable development? **(9 Marks)**



- c. EPA list four characteristics of hazardous waste, name any three of them. **(3 Marks)**

**Question Three [Total of 20 Marks]**

a. Explain the diagram below ( 12 marks)



b. Explain the phenomenon of “Global warming”. (4 marks)

c. What is the purpose of environmental regulation? (4 Marks)

**Question Four [Total of 20 Marks]**

a. What are the following (4 marks)

- i. Biological hazards
- ii. Thunderstorm

b. From start to end, list the important steps in the EIA process and discuss the second, third and fourth steps. (10 Marks)

c. What is the earth made of? (6 marks)

**Question Five [Total of 20 marks]**

- a. Every sphere has a flow of matter and energy to every other sphere, which is a two-way linkage, with a distinct example explain how the atmosphere, hydrosphere and the lithosphere is connected. **(6 marks)**
- b. The purposes of environmental impact assessment includes the following below, discuss anyone of your choice. **(4 marks)**
  - a. An aide to decision making
  - b. An aid to the formulation of development actions
  - c. An instrument for sustainable development
- c. What is Solid-waste management? **(4 marks)**
- d. The following Global Warming, Acid Rain, Ozone Layer Depletion, Air Pollution, Water Pollution, Land Pollution, Noise Pollution, Eutrophication, Loss of Biodiversity are all man-made hazards. With any three of your choice, name three impact and remedial measures of each of your choice. **(6 marks)**

**Question Six [Total of 20 marks]**

- a. The Environmental Protection Agency (EPA) has identified four (5) basic management options (strategies) for ISWM: Briefly explain the 3 Rs as used in waste management. **(6 marks)**
- b. What is the difference between solid waste management and integrated solid waste management **(2 marks)**
- c. State 4 advantages of incineration over landfill **(4 marks)**
- d. Contaminant transport in soil is significant in the design of waste management facilities. For the design it is important to understand the governing mechanism of contaminant transport through soil. In your own word, discuss the governing mechanisms of contaminant transport. **(8 marks)**

**Examiner: Vivian Isabella Seshie**

Co-examiner: Dr Jennifer MacCarthy

**Good Luck (Miss Seshie)**