

## Ohio Area Current Environmental Issue Envirothon Exam

1. One of the major contributors to climate change is the greenhouse effect. Through this process, human emissions have caused most of the warming since the 1950s. Which of the following gases is the primary contributor to the greenhouse effect?
  - a. Methane
  - b. Nitrous Oxide
  - c. **Carbon Dioxide**
  - d. F-Gases
  
2. Ground-level ozone is created when emissions react with volatile organic compounds from automobiles, power plants, and other industrial and commercial sources. Which of the following is not an effect of ground-level ozone?
  - a. Reduces the greenhouse effect
  - b. **Increased quality of life**
  - c. Respiratory health problems
  - d. Damage to crops and other vegetation
  
3. Factors that contribute to climate change can be put into two distinct categories – factors that are related to natural processes and factors that are related to human activity. Which of the following is not a natural factor contributing to climate change?
  - a. Volcanic Activity
  - b. **Automobile combustion**
  - c. Earth's orbit around the sun
  - d. Solar Output
  
4. Carbon dioxide remains in the atmosphere for a long time and continues to affect the climate system (long residence time). However, human activities such as fossil fuel combustion and agriculture emit other substances that have short- and long-term impacts on climate. What is a long-lived climate factor that contributes to long-term climate change?
  - a. Sulphate Aerosols
  - b. Tropospheric Ozone
  - c. Methane
  - d. **Nitrous Oxide**

This exam was created by researchers and students at The Ohio State University with resources provided by the State Climate Office of Ohio, the Ohio State University Extension, and the Byrd Polar and Climate Research Center.



5. Some climate forcers can cool rather than warm Earth's atmosphere. During fossil fuel combustion, another emitted gas combines with water vapor in the atmosphere to create these tiny droplets which reflect sunlight. What is the name of these tiny droplets that only remain in the atmosphere for a few days and have a cooling effect on the atmosphere?
- Sulphate aerosols**
  - Water vapor
  - Ozone
  - Perfluorocarbons
6. There are many sectors that contribute to greenhouse gas emissions. Which sector contributes the least?
- Industry (cement and chemicals)
  - Waste (wastewater and landfills)**
  - Energy (in industry, in buildings, and transportation)
  - Agriculture, Forestry & Land Use (crops and livestock)
7. A major contributor to climate change is the amount of greenhouse gases that are emitted by humans. How much greenhouse gases are emitted by the world each year?
- 50 billion tons**
  - 10 billion tons
  - 150 million tons
  - 30 billion tons
8. The second highest contributor to global greenhouse gas emissions is the Agriculture, Forestry and Land Use sector. Of this sector, which category emits the most greenhouse gases?
- Rice cultivation
  - Crop burning
  - Livestock and manure**
  - Cropland
9. Burning natural gas is a more efficient and economical energy source than coal or petroleum. However, the use of natural gas has some environmental and safety issues involved. What greenhouse gas is emitted when natural gas leaks occur?
- Carbon Dioxide
  - Methane**
  - Aerosols
  - Polyfluoroalkyl Substances
10. In the year 2020, 60% of electricity in the United States was produced from fossil fuels, biomass, and municipal and industrial wastes. Gases are released when these fuels are burned to produce electricity. Which of the following is not one of the gases released in this process?
- Argon**

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- b. Nitrogen Oxides
  - c. Sulfur Dioxide
  - d. Carbon Monoxide
11. While most dams in the United States are built for flood control, municipal water supply, and irrigation, many of these dams have hydroelectric generators. What is a negative environmental effect of hydropower generators and dams?
- a. Obstructs fish migration
  - b. Changes natural water temperatures, chemistry, and river flow
  - c. Alters downstream ecosystems
  - d. All the above**
12. Climate change indicators are visible across the world with scientists from a wide range of disciplines working to understand their feedbacks and effects. Which of the following are climate change indicators in oceanography?
- a. Increase in ocean temperatures
  - b. Sea level rise
  - c. Increase in ocean acidity
  - d. All the above**
13. Over the last 30 years there have been numerous international negotiations to deal with the threat of climate change. How much has the amount of carbon dioxide in the atmosphere changed over this period?
- a. It has stayed the same
  - b. It has decreased
  - c. It has doubled**
  - d. Carbon emissions have gone to zero
14. In the last 50 years, many groups have been formed to study how the climate is changing and what can be done to help prevent climate change. Which group was formed in 1988 and is the United Nations body for assessing the science related to climate change?
- a. The Intergovernmental Panel on Atmosphere and Development
  - b. The Intergovernmental Panel on Climate Change**
  - c. United Nations Framework Convention on Doubling Carbon Dioxide
  - d. United Nations Conference on Atmosphere and Development
15. In 2015, the Paris Agreement was signed by 193 countries and the European Union. This Agreement pledged to reduce global emissions and keep global temperatures from rising. In 2018, the IPCC released a report that outlined what needed to be done to reduce the effects of climate change and keep global temperature to the threshold set forth by the Paris Agreement. What range of temperatures was agreed on in the Paris Agreement?
- a. 1.5°C to 2°C**
  - b. 3°C to 5°C
  - c. 0°C to 0.5°C
  - d. 5°C to 8°C

16. Climate models are used to show the impacts of a changing climate worldwide, under a range of future scenarios. How do scientists gain confidence in the outcomes of these future climate simulations?
- Hope for the best outcomes
  - Hindcasting**
  - Poll for their favorites
  - Only analyze models from developed nations
17. Climate models are based on well-documented physical processes that simulate the transfer of energy and materials throughout the climate system. What are climate models also known as?
- General Circulation Models**
  - Robotic Atmosphere Models
  - Global Carbon Models
  - Artificial Intelligence Atmospheric Simulators
18. Between 2016 and 2019 climate change cost North Americans \$415 billion dollars. What is something that should not be done by individuals, businesses, and governments to protect themselves?
- Consider the implications of climate change when choosing where to spend their money and investments
  - Buy land and move to an area with frequent wildfires and/or poor development decisions**
  - Do not buy real estate in an area that is vulnerable to sea level rise
  - Purchase flood and fire insurance
19. After setting up climate targets, countries and companies need to consider how to quantify, reduce, and monitor their emissions. This process can be challenging for countries that are unsure of what to do. What is another challenge that countries and companies will face when quantifying, reducing, and monitoring emissions?
- It is expensive
  - It takes a lot of time
  - It can be prone to errors
  - All the above**
20. The changing climate will have significant impacts on the forestry industry. What is an impact that the forestry industry will face due to climate change?
- Shifted ranges in tree species**
  - Decreased storm events and severity of storm events
  - Decreased risk of wildfires
  - Decreased risk of pest and pathogens

