



**NATIONAL OPEN UNIVERSITY OF NIGERIA**  
**PLOT 91, CADASTRAL ZONE, NNAMDI AZIKIWE EXPRESSWAY, JABI - ABUJA**  
**FACULTY OF SCIENCES**

**DEPARTMENT OF PURE AND APPLIED SCIENCE**

**2020\_2 EXAMINATIONS...**

**COURSE CODE:** PHY 457

**COURSE TITLE:** ENVIRONMENTAL PHYSICS

**CREDIT UNIT:** 3

**TIME ALLOWED:** (2½ HRS)

**INSTRUCTION:** *Answer question 1 and any other four questions*

**QUESTION 1**

- a. Define the following terms: (i) Air Pollution (ii) Water Pollution (iii) Thermal pollution **(6 marks)**
- b. List and explain any three properties of the Earth's atmosphere **(6 marks)**
- c. Describe briefly the following (i) Earth's orbit (ii) Altitude  
(iii) Analemma (iv) Escape velocity **(8 marks)**
- d. Explain the concept of the many-body problem in details **(2 marks)**

**QUESTION 2**

- a. Describe the Greenhouse effect and how its affect the temperature and radiation emitted at the surface, in the atmosphere and at top of the atmosphere. **(6 marks)**
- b. Explain the term Global warming and state the major causes of global warming **(4 marks)**
- c. List two energy sources that do not increase carbon emission **(2 marks)**

**QUESTION 3**

- a. State the Keplers' second Law **(2 marks)**
- b. Hence, derive the expression for Keplers Second law **(4 marks)**
- c. The Lyman series of lines in the emission spectrum of hydrogen corresponds to transitions from various excited states to the  $n = 1$  orbit. Calculate the wavelength of the lowest-energy line in the Lyman series to three

significant figures. In what region of the electromagnetic spectrum does it occur?

**(4 marks)**

d. Discuss space exploration

**(2 marks)**

#### **QUESTION 4**

a. What is meant by geostrophic balance?

**(2 marks)**

b. Explain the term atmosphere and describe the composition of atmosphere

**(4 marks)**

c. Enumerate six elements of the weather and climate

**(6 marks)**

#### **QUESTION 5**

a. Explain the following terms: (i) Air pollution control (ii) Air pollution management **(4 marks)**

b. List and explain any two sources of man-made air pollution

**(6 marks)**

c. Which weather phenomena would be nearly impossible to observe without the aid of satellite imagery?

**(2 marks)**

#### **QUESTION 6**

a. Differentiate between Lapse rate and adiabatic lapse rate

**(4 marks)**

b. Enumerate the three types of Lapse rate

**(3 marks)**

c. List and discuss any two categories of atmospheric stability

**(5 marks)**