



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)