



NATIONAL OPEN UNIVERSITY OF NIGERIA
PLOT 91, CADASTRAL ZONE, NNAMDI AZIKIWE EXPRESSWAY, JABI - ABUJA
FACULTY OF SCIENCES
DEPARTMENT OF PHYSICS
2024 1 EXAMINATION

COURSE CODE: PHY 455
COURSE TITLE: LOWER ATMOSPHERIC PHYSICS
CREDIT UNIT: 3
TIME ALLOWED: (3 HRS)
INSTRUCTION: *Answer question 1 and any other THREE questions*

QUESTION 1

- (a) Define radiated coupling (3marks)
- (b) List five (5) significant of atmosphere to a man (10marks)
- (c) Mention two (2) limitations of first law of thermodynamics (4marks)
- (d) List four (4) practical application of steady flow energy equation (8marks)

QUESTION 2

- (a) What is microscopic approach in thermodynamics (3marks)
- (b) Discuss three (3) types of electromagnetic coupling (6marks)
- (c) List four (4) equilibrium mixture phases (6marks)

QUESTION 3

- (a) Define specific heat capacity in thermodynamics (3marks)
- (b) Differentiate between Cyclic process and internal energy (8 marks)
- (c) State the first law for a closed system undergoing a process and a cycle (4marks)

QUESTION 4

- (a) Define space weather (3marks)
- (b) Distinguish between state and process of thermodynamic state (6marks)
- (c) What are the conditions for steady flow process (6marks)

QUESTION 5

- (a) Define Helmholtz Free Energy (3marks)
- (b) Differentiate between adiabatic expansion and adiabatic compression (8marks)
- (c) Which quantities remain constants in an adiabatic process (4marks)

QUESTION 6

- (a) Define Canonical ensemble of a system (3marks)
- (b) What are the two (2) conditions of the adiabatic processes (4marks)

(c) Fill and complete the following table on the components of the atmosphere (8marks)

Components	Percentages
Nitrogen	-----
Oxygen	-----
Argon	-----
Neon, Helium, Krypton	-----