****

**NATIONAL OPEN UNIVERSITY OF NIGERIA**

**PLOT 91, CADASTRAL ZONE, NNAMDI AZIKIWE EXPRESSWAY, JABI - ABUJA**

**FACULTY OF SCIENCES**

**DEPARTMENT OF PURE AND APPLIED SCIENCE**

 **JULY 2018 EXAMINATIONS**

**COURSE CODE: PHY 457**

**COURSE TITLE: ENVIRONMENTAL PHYSICS**

**CREDIT UNIT 3**

**TIME ALLOWED (21/2 HRS)**

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

**QUESTION 1**

Q.1 (a) What is environmental Physics? **(3 marks)**

 (b) What are the ultimate aims of the environmental Physicist? **(2 marks)**

 (c) State the expression for the efficiency of heat engine. **(2 marks)**

 (d) Write the equations of motion in a many-body-system. **(2 marks)**

 (e) What are the constituents of the ten known integrals of the motion?

 **(2 marks)**

 (f) State the mathematical form of Kepler’s second law. **(2 marks)**

 (g) What are the five distinct components of the earth? **(21/2 marks)**

 (h) State five characteristics of terrestrial atmosphere. **(21/2 marks)**

 (i) Write the expression for the orbital radius, r of synchronous **(2 marks)**
 satellites.

 (j) State two aggregation rules that must be applicable in order to
 carry out an effective cost-benefit analysis. **(2 marks)**

**QUESTION 2**

 If all synchronous satellites are put into orbit whose radius r is
 4.23 x 107m and the orbit is in the plane of the equator. Find the angular
 separation of the satellites in degree if the arc lengths that separates two
 adjacent synchronous satellites is 7.4 x 105m. **(12 marks)**

**QUESTION 3**

 Consider n massive particles having mi, where i = 1, 2, …., n and
 supposing that their radius vectors from an unaccelerated reference point
 O are $\overbar{R}\_{i}$ while their mutual radius vectors are given by $\rightharpoonaccent{r}\_{ij}$ where
 $\rightharpoonaccent{r}\_{ij}=\rightharpoonaccent{R}\_{j}-\rightharpoonaccent{R}\_{i}$, derive the required set of equations of motions in a
 many-body problem. **(12 marks)**

**QUESTION 4**

 Briefly explain Ozone layer depletion and Global warming. **(12 marks)**

**QUESTION 5**

 Describe in details what you understand by Environmental Modelling.

 **(12 marks)**

**QUESTION 6**

 Explain the term nuclear energy and narrates its advantages and
 disadvantages. **(12 marks)**