# EASTERN UNIVERSITY, SRI LANKA

## THIRD EXAMINATION IN SCIENCE 2005/2006 (AUG-SEP. 2007)

## FIRST SEMESTER

## REPEAT

## PH 306 – ENVIRONMENTAL PHYSICS

Time: 01 hour.
Answer ALL Questions.

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1. (a) Define the following without any diagrams and equations:
   - i. Ionosphere
   - ii. Tropopause
   - iii. Surface energy balance
   - iv. Solar constant

   (b) Discuss the problem of global ozone depletion and why the Antarctic ozone hole is deepest in the spring?

   (c) Using the Beer-Lambert law, calculate the percentage increase in $260nm$ UV radiation reaching the Earth's surface at the South Pole when the "ozone hole" is 50% that of the normal concentration $(3.2\times10^{16}m^{-3})$. Assume that the photo-absorption cross-section for $260nm$ UV light is $10^{-21}m^2$ and that the stratosphere is $40km$ deep.

2. (a) Investigate what contribution could be made by renewable energy sources to our country's energy requirements.

   (b) Discuss between the purpose and mode of action of a "flat plate collector" and a "photovoltaic cell", each of which has been designed for exposure to solar radiation.

   (c) Choose three different insulating materials used in modern buildings. For each material, use the physical properties of the material and the principles of energy transfer to explain why the material acts as a good thermal insulator.