UNIVERSITY COLLEGE LONDON

University of London

EXAMINATION FOR INTERNAL STUDENTS

For The Following Qualification:-

M.Sc.

ESGE1: The Built Environment: The Energy Context

COURSE CODE	:	**ENVSGE01**
DATE	:	**06-MAY-03**
TIME	:	**14.30**
TIME ALLOWED	:	**2 Hours**

TURN OVER

UNIVERSITY OF LONDON

MSc DEGREE in SCIENCE in BUILT ENVIRONMENT 2003

for Internal Students of University College London

Module ENVS GE 01: BUILT ENVIRONMENT: The Energy Context

Answer TWO questions only. Answer all parts of the questions chosen.

1. In order to limit climate change the UK government has recently announced its intention to reduce UK carbon dioxide emissions by 60% by 2050.

   (a) Explain why buildings are critical to this policy. (*10 marks*)

   (b) Over the last 30 years, UK domestic carbon dioxide emissions have both risen and fallen from year to year. Discuss what might have been the cause for these changes. (*20 marks*)

   (c) What actions would you recommend the Government takes to achieve its intention of reducing building carbon dioxide emissions 60% by 2050 and why? (*20 marks*)

2. A friend is considering purchasing a newly built bungalow with a SAP of 60.

   (a) How would you explain to your friend what the SAP rating is, how it is calculated and what the SAP scheme aims to achieve. (*15 marks*)

   (b) The same housing estate has a semi-detached house which was constructed at the same time as the bungalow using similar construction, but has a SAP of 70. How would you explain the change in SAP rating? (*10 marks*)

   (c) Your friend has asked for advice on how the SAP rating of the bungalow could be improved. What advice would you give and why? (*20 marks*)

   (d) The Government has recently added a carbon rating to the SAP calculation. Why is this additional calculation necessary for the SAP rating scheme to achieve its aims? (*5 marks*)

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3. (a) Explain why electricity produced from "renewable" energy sources is less damaging to the environment than that produced from fossil fuels. (*10 marks*)

(b) List as many "renewable" sources of energy as you can, then take **THREE** (excluding photovoltaics) and describe how electricity can be produced from each, using diagrams and sketches where appropriate. Discuss each one's advantages and disadvantages and highlight its potential to reduce dependence on fossil fuel power production in the UK. (*20 marks*)

(c) London has recently introduced "congestion charging". Discuss what affect this is likely to have on the quality of life for people living in London. (*20 marks*)

4. (a) Using diagrams and sketches to illustrate your answer, explain briefly the physical principles behind which photovoltaic (PV) cells convert solar radiation into electricity. (*10 marks*)

(b) List, then discuss briefly, the factors which affect the electrical conversion efficiency of PV cells. (*15 marks*)

(c) Take an example of building integrated photovoltaics (BIPV) in the UK and discuss how the designers have integrated the system into the building, highlighting the successes and failures of the overall design. (*20 marks*)

(d) Discuss briefly your views of the potential of PV systems to reduce the use of fossil fuel for electrical production in the world in general. (*5 marks*)

END OF PAPER