On admission to the examination room, you should acquaint yourself with the instructions below. You must listen carefully to all instructions given by the invigilators. You may read the question paper, but must not write anything until the invigilator informs you that you may start the examination.

You will be given five minutes at the end of the examination to complete the front of any answer books used.

May/June 2014

3 Answer Books
Treasury Tags

UNIVERSITY OF READING

SUSTAINABILITY (CE3CS1)

Two hours

Answer THREE questions

Use a separate Answer Book for EACH Question.

Do not repeat material, or make substantial use of the same text in more than one answer.
1. (a) Briefly describe **two** environmental impacts that are often considered during an Environmental Impact Assessment (EIA) prior to starting a major new project.  

(5 marks)

(b) For each of these **two** environmental impacts, describe **two** mitigation features, and explain why each is important for reducing or avoiding the environmental impacts.  

(20 marks)

2. (a) In the UK, the government is calling for a reduction in the environmental impacts of construction work. Discuss **three** changes in construction practice in the UK that are intended to **mitigate** the effects of global warming, in line with government policies.  

(15 marks)

(b) Describe **three** features that designers will need to incorporate into building design in order to **adapt** to a changing climate; you may include **any** building features in your answer.  

(10 marks)
3. (a) Discuss the concept of heat transfer in buildings.
   (9 marks)

(b) Explain the concept of Passive Solar Design (PSD).
   (4 marks)

(c) Passive Solar Design (PSD) strategies vary by building location and regional climate, but the basic techniques remain the same. Describe the techniques required to maximise solar heat gain in winter and minimise it in the Summer.
   (12 marks)

4. Propose two alternatives to a gas boiler for heating a new, large office building. Within your answer, explain the advantages and disadvantages of each alternative. Also, explain how you expect future changes in the UK energy supply system to influence the economic and environmental case for each of your two alternatives.
   (25 marks)
5. (a) Explain how green roofs provide environmental benefits with respect to;

(i) Reducing urban heat island effects (4 marks)
(ii) Stormwater attenuation and storage (6 marks)

(b) In an unimproved pre-1980 property, explain why the water efficiency in the dwelling may be low. Describe three household water fittings &/or water-using appliances that show how the water efficiency of the property may be significantly improved. (15 marks)

(End of Question Paper)