THE OPEN UNIVERSITY OF SRI LANKA
Diploma in Technology (Civil) - Level 4
CEX 4235 – Building Engineering
Final Examination 2006
Time allowed: **Three hours**

Date: Friday 30th March 2007 Time: 0930 – 1230 hours

Answer any five questions.
Use sketches with notes where relevant

1. a) *Discuss two* objectives of the outline design stage and why this stage is important for the success of a project. (5 marks)

   b) *Discuss with sketches, three reasons* why 'orientation' is vital for a building during use and in the long term. (5 marks)

   c) *Briefly discuss three* factors you consider should be examined in an 'Environmental Impact Assessment' for the setting up of a group of factory buildings. (5 marks)

   d) *Explain using a layout sketch* of a typical hospital building, what is meant by 'primary circulation', 'secondary circulation' and 'domain'. (5 marks)

2. a) Use *two* relevant examples to *briefly explain* how you would investigate the *feasibility* of a project noting the input you would need from the architectural, engineering consultants and quantity surveyor for each investigation you have taken. (6 marks)

   b) *Explain with an example*, why a standard method of measurement should be used in preparing the bill of quantities for construction work. (4 marks)

   c) *Indicate with a sketch all* the loads that could act on an upper floor of a framed building functioning as a multi storeyed car park; *list* any assumptions you make. (4 marks)

   d) *Explain using sketches two* ways in which the topography of a site in a hilly area would affect the architectural and structural design of a hospital complex. (6 marks)

3.a) *Discuss five* factors you would consider in choosing a site for a Study Centre for the Open University. (5 marks)

   b) *Discuss three* reasons why Building laws are necessary. (5 marks)

   c) Compare the advantage and disadvantage of a loadbearing wall system and a frame system for buildings, giving examples where each may be advantageously used. (5 marks)

   d) *Explain* what you understand by 'specifications' and give *two examples*, one of a specification pertaining to architectural input and one pertaining to structural work (5 marks)

4. a) *Sketch* two successive courses of a 'one brick' wall in English bond and *explain* how English Bond helps to improve the strength and stability of brickwork. (6 marks)

b) *Discuss three* possible causes for dampness in walls and the rectification for each. (5 marks)

c) *Briefly describe four* precautions that should be taken prior to and while plastering a newly built brick wall. (5 marks)

d) *Explain with relevant sketches* the functions of the following roof members: purlin, rafter, wall plate. (4 marks)

5. a) *Name* and *describe* the process of primary digestion that takes place in a septic tank. (5 marks)

b) *Explain briefly* what you understand by 'water seal', 'trap' 'siphonage' and vent pipe. (5 marks)

c) *Sketch with brief descriptive notes three* of the processes for water purification prior to disinfection, used in the Raddoluwa housing scheme. (5 marks)

d) *Briefly compare* the grid and branched systems for water distribution. (5 marks)

6. a) *Briefly describe* the scope and the objective of the Wiring Regulations. (4 marks)

b) *Name and describe* the system of electrical distribution used in Sri Lanka and *explain* any advantages over other systems. (5 marks)

c) *Explain* the following:
- short circuit current
- over current
- overload current
- instantaneous tripping

(6 marks)

d) Describe with a sketch the operating principle of a conventional Residual Current Circuit Breaker (RCCBs) and explain its use. (5 marks)

7. a) Explain the following terms: Glare Index, Daylight factor. (5 marks)

b) Compare the principle of illumination and lighting efficacy of mercury vapour discharge lamps and fluorescent tubes. (5 marks)

c) Describe a sling hygrometer explaining the parameters that it could be used to measure. (3 marks)

d) Sketch a psychrometric chart, indicate the significant variables and compare what is meant by heating (latent) and heating (sensible), and mark these processes in the chart. (7 marks)