

Exercise 01

(For self-evaluation, no need to submit)

(Please try to answer without referring to the lecture notes)

1. Sustainable Building Concepts

- 1.1 Briefly explain the meaning of sustainable development and the three dimensions of sustainability.
- 1.2 Discuss the typical problems of the built environment in Hong Kong. Describe three 'green features' proposed by the Green Building Joint Practice Notes in Hong Kong.
- 1.3 Draw a diagram to describe the environmental criteria & factors commonly considered in green and sustainable buildings.
- 1.4 Describe the basic principles of sustainable urban design. Discuss the design strategies to achieve sustainable site.
- 1.5 Briefly explain the design strategies of energy efficiency in buildings. What are the three common methods to integrate solar energy in buildings?
- 1.6 What is the meaning of 'embodied energy'? Briefly describe the principles to specify green materials and products.
- 1.7 Briefly describe the design strategy for water efficiency. Gives two examples of water conservation systems in buildings.
- 1.8 What are the four major areas of indoor environmental quality? Briefly describe the four principles of indoor air quality design.

2. Green Building Assessment

- 2.1 Which green building assessment tool is used as a reference in many countries and is often considered the first generation of green building assessment method? Briefly describe its basic concept and approach.
- 2.2 What are the different types of the current LEED (Leadership in Energy and Environmental Design) systems? Which one is the most commonly used?
- 2.3 Briefly describe how the building environmental efficiency (BEE) is defined in the CASBEE (Comprehensive Assessment System for Building Environmental Efficiency) system in Japan.
- 2.4 Draw diagrams to explain the building life cycle stages and performance categories of the Comprehensive Environmental Performance Assessment Scheme (CEPAS) for

Buildings in Hong Kong.

- 2.5 What are the seven green design categories in the LEED 2009 (or version 3) new construction? Briefly explain the prerequisites of the LEED new construction.
- 2.6 Briefly describe the three tiers of the new LEED professionals system. What are the two phases of submission for the LEED system.
- 2.7 Briefly explain the key factors for energy and atmosphere under the LEED new construction system.
- 2.8 What are the four important ASHRAE standards which are often referred to in the LEED assessment method? Briefly explain each of them.

3. Energy and Environmental Design

- 3.1 Briefly describe the environmentally responsive design process for sustainable building projects.
- 3.2 Explain the meaning of 'Charrette' and describe the benefits of using it for promoting sustainable building design.
- 3.3 Explain the five basic types of predesign energy analyses. Which one is mainly used for existing buildings?
- 3.4 Briefly describe the free cooling methods in HVAC system. Explain the different definitions of zero energy building.
- 3.5 Briefly explain the four important components of life cycle assessment (LCA). Describe the common environmental performance indicators used in LCA.
- 3.6 Discuss the three phases of building material life cycle. Draw a diagram to show the relationship among them.
- 3.7 Explain the difference between life cycle assessment (LCA) and life cycle costing (LCC). Briefly explain the equation for life cycle costing (LCC) calculation.
- 3.8 Describe the typical steps of carbon audit according to the EPD guidelines. Briefly explain the scope of greenhouse gas (GHG) emissions.