

Self-Evaluation Exercise (2008-2009)

(No need to submit)

Cold and Hot Water Supplies

1. Briefly explain the water treatment process for fresh water supply in Hong Kong. Illustrate with diagrams if needed.
2. With the help of schematic diagrams, describe the following methods of water supply distribution in buildings.
 - i) Direct supply system (with storage tank)
 - ii) Indirect supply system (with sump and pump)
 - iii) Indirect supply system (with pneumatic vessel)
3. Briefly describe the Quality Water Recognition Scheme for Buildings as operated by the Water Supplies Department in Hong Kong.
4. Briefly explain the Total Water Management (TWM) strategy set up in recent years by the Hong Kong Government.
5. Discuss the key factors to be considered when selecting and designing hot water supply systems.
6. Compare the characteristics of flat-plate and evacuated-tube solar collectors for providing hot water to buildings.
7. Draw schematic diagrams to show the typical designs of direct and indirect centralised hot water systems.
8. Briefly explain what are “dead legs” in hot water systems and suggest two methods to avoid them.
9. Discuss the impacts of oversizing and undersizing for the pipework in the cold and hot water supply systems.
10. Briefly describe the pros and cons of using the following pipe materials in water systems.
 - i) Copper
 - ii) Stainless steel
 - iii) Lined galvanized steel
11. Compare the main characteristics of centrifugal & positive displacement pumps.
12. Discuss the possible methods to achieve better water efficiency and conservation in buildings.

Steam Systems and Drainage Systems

13. Briefly describe the advantages of using steam over hot water as a heating medium in building applications. What are the major drawbacks of the steam system?
14. Briefly explain the operating principles of the following types of steam traps. Illustrate with diagrams if needed.
 - i) Thermostatic steam trap
 - ii) Open bucket steam trap
 - iii) Thermodynamic steam trap
15. Draw a diagram to explain the basic structure of a boiler. Clearly indicate the inputs and outputs.
16. What are the three methods of estimating steam consumption? Briefly describe each of them.
17. Discuss why the drainage system could be a reason for the spread of SARS disease at the Amoy Garden in Hong Kong in 2003. What are the possible methods to prevent this?
18. Briefly explain the possible reasons for the loss of water seal in building drainage systems. Illustrate with diagrams, if needed.
19. Briefly describe the design concept of the following sanitary drainage systems.
 - i) Single stack system
 - ii) Modified single stack system
 - iii) Two-pipe system
20. Briefly explain the method to calculate the rain water flow rate for design of the stormwater drainage systems.
21. Compare the following arrangements for sewage disposal systems.
 - i) Combined system
 - ii) Separate system
 - iii) Partially separate system
22. What are the possible methods for disposal of stormwater? Briefly describe each of them.
23. Draw diagrams to show the basic design of a septic tank.
24. Explain the typical process of sewage treatment. Illustrate with diagrams.