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**UTHM**  
Universiti Tun Hussein Onn Malaysia

**UNIVERSITI TUN HUSSEIN ONN MALAYSIA**

**FINAL EXAMINATION  
SEMESTER II  
SESSION 2022/2023**

COURSE NAME	:	WATER DRAINAGE & PLUMBING SYSTEM
COURSE CODE	:	BNB 31703
PROGRAMME CODE	:	BNB
EXAMINATION DATE	:	JULY/AUGUST 2023
DURATION	:	3 HOURS
INSTRUCTIONS	:	<ol style="list-style-type: none"><li>1. ANSWER ALL QUESTIONS</li><li>2. THIS FINAL EXAMINATION IS CONDUCTED VIA <b>CLOSED BOOK</b>.</li><li>3. STUDENTS ARE <b>PROHIBITED</b> TO CONSULT THEIR OWN MATERIAL OR ANY EXTERNAL RESOURCES DURING THE EXAMINATION CONDUCTED VIA CLOSED BOOK</li></ol>

THIS QUESTION PAPER CONSISTS OF **THREE (3)** PAGES

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- Q1**
- (a) Water demand is very important factor when designing a Community Based Water Supply Scheme. Define water demand. (4 marks)
  - (b) Explain the fixture unit approach in plumbing. (5 marks)
  - (c) A model pump of 5 inches diameter develops 0.25 hp at a speed of 800 rpm under a head of 2.5 feet. A geometrically similar pump 15 inches in diameter is to operate at the same efficiency at a head of 49.0 feet. Compute speed and power should be expected. (8 marks)
  - (d) Point out the strategies for managing and reducing water demand, including the benefits and challenges associated with each. (8 marks)
- Q2**
- (a) Describe the primary function of a pump system. (3 marks)
  - (b) Distinguish between a centrifugal pump and a positive displacement pump. (4 marks)
  - (c) Determine the significance of the specific speed of a pump. (4 marks)
  - (d) Explain the meaning of the pump characteristic curves. (8 marks)
  - (e) Discuss the key factors that need to be considered when matching a pump and piping system. (6 marks)
- Q3**
- (a) Identify the purpose of a cold and hot water supply system in a building. (3 marks)
  - (b) Differentiate between a direct and an indirect cold water supply system. (4 marks)

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- (c) Consider that you are designing a plumbing system for a large commercial building with multiple floors. Discuss **TWO (2)** factors that must be taken into account when selecting the proper water pressure for the hot and cold water supply systems.

(4 marks)

- (d) Describe **FOUR (4)** factors to consider when selecting the right size of plumbing pipes for a building.

(8 marks)

- (e) Discuss **THREE (3)** the importance of proper maintenance of a plumbing system.

(6 marks)

- Q4 (a) Define sanitation and explain its importance in maintaining public health.

(3 marks)

- (b) Discuss the different types of sewage systems used in urban areas.

(4 marks)

- (c) Describe the steps involved in designing a drainage system for a building.

(7 marks)

- (d) Identify **THREE (3)** safety precautions that should be taken when working with gas pipes in a building.

(6 marks)

- (e) Discuss how more energy-efficient gas systems can be designed and the benefits of doing so.

(5 marks)

**-END OF QUESTIONS –**

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