Universiti Tun Hussein Onn Malaysia

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATION
SEMESTER II
SESSION 2018/2019

COURSE NAME	:	WATER, DRAINAGE AND PLUMBING SYSTEM
COURSE CODE	:	BNB 31703
PROGRAMME CODE	:	BNB
EXAMINATION DATE	:	JUNE / JULY 2019
DURATION	:	2 HOURS 30 MINUTES
INSTRUCTION	:	ANSWERS **ALL** QUESTIONS

THIS QUESTION PAPER CONSISTS OF **FOUR (4)** PAGES

Q1 (a) With the aid of a diagram, categorize **THREE (3)** types of water distribution system.
(6 marks)

(b) (i) List **THREE (3)** types of pipe in domestic water supply system.
(3 marks)

(ii) Differentiate the pipe distribution that mentioned in **Q1(b)(i)**.
(6 marks)

(c) State **TWO (2)** sections in FG Filter Separator.
(4 marks)

(d) Describe the function of Fuel Gas Super Heater E-6230A/B.
(6 marks)

Q2 (a) Identify **TWO (2)** types of Centrifugal pump.
(2 marks)

(b) State **THREE (3)** types Centrifugal pump are available based on the suction and discharge arrangement.
(3 marks)

(c) Briefly explain the working mechanism of a Centrifugal pump.
(4 marks)

(d) With the aid of a sketch, classify **THREE (3)** major parts of a Centrifugal pump with their functions.
(6 marks)

(e) A Centrifugal pump is required to produce a flow of water at a rate of 0.0180 m^3/s against a total head of 30.5 m. Given the operating characteristic of a pump at a speed of 1450 rev/min and a rotor diameter of 150 mm as plotted in **Figure Q2(e)** which assume the speed for a geometrically similar pump at the required conditions.

(i) Calculate the specific speed of the pump at Point A.
(2 marks)

(ii) Based on the answer at **Q2(e)(i)**, determine the correct size of pump and its speed to produce the required head and flow.
(8 marks)

Q3 (a) Identify **TWO (2)** types of Hot Water Service System.
(2 marks)

(b) Explain in details the Pressurized Hot System.
(10 marks)

(c) Develop the procedure in piping sizing process to make sure the size of pipe is suitable with condition and demand.

(5 marks)

(d) Differentiate between the Stainless Steel Pipe and Copper Pipe.

(8 marks)

Q4 (a) Define the term of sanitary drainage system.

(2 marks)

(b) Briefly explain on **TWO (2)** types of material used for sanitary components.

(6 marks)

(c) Compare between Soil Fitment and Ablution Fitment by giving **ONE (1)** example for each.

(4 marks)

(d) All sanitary fitments discharging into a system of drainage must be fitted with a water seal device or trap, to prevent and stops sewer gases from coming into the building. Give **ONE (1)** example and discuss how water seal can be destroyed.

(5 marks)

(e) Sketch a drainage system for a house and briefly describe the drainage structures involved.

(8 marks)

- END OF QUESTIONS –

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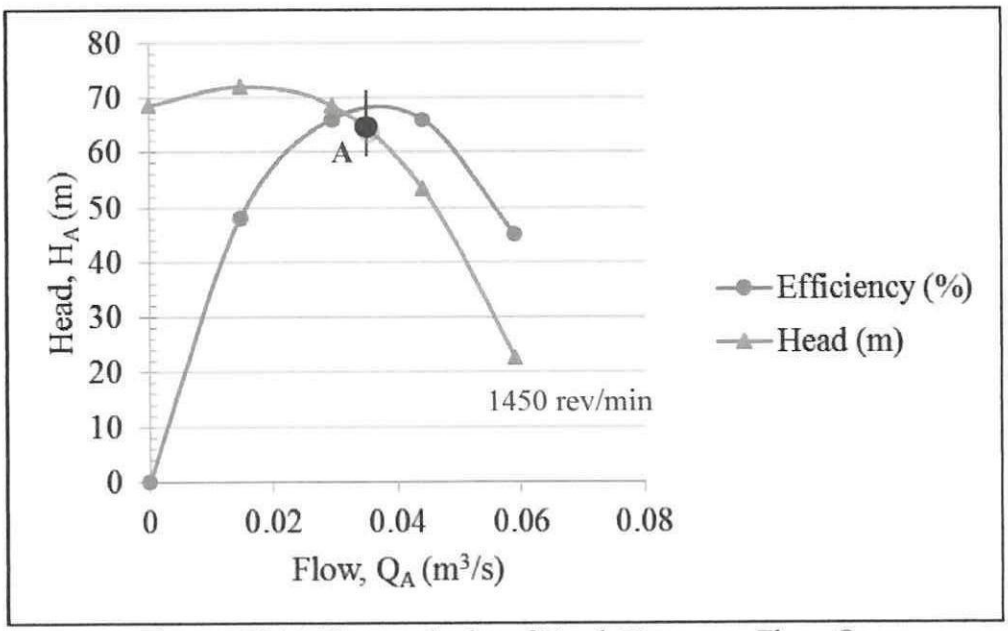

Figure Q2(e) The graph plot of Head, H_A versus Flow, Q_A

	Head	Flow
Optimal Point **A**	65 m	0.036 m^3/s

LIST OF FORMULA

Specific speed point A

$$N_s = \frac{N_A Q_A^{\frac{1}{2}}}{H_A^{\frac{3}{4}}}$$

Specific speed point B

$$N_B = Ns\frac{H_B^{\frac{3}{4}}}{Q_B^{\frac{1}{2}}}$$

Equating flow coefficients

$$D_B = D_A\left(\frac{Q_B N_A}{Q_A N_B}\right)^{1/3}$$

Equating head coefficients

$$D_B = D_A \frac{N_A}{N_B}\sqrt{\frac{H_B}{H_A}}$$