Universiti Tun Hussein Onn Malaysia

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATION
(ONLINE)
SEMESTER II
SESSION 2019/2020

COURSE NAME	:	BUILDING SERVICES TECHNOLOGY
COURSE CODE	:	BFR 32103
PROGRAMME CODE	:	BFR
EXAMINATION DATE	:	JULY 2020
DURATION	:	6 HOURS
INSTRUCTION	:	ANSWER **ALL** QUESTIONS

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

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Q1 (a) Define the term of 'Building Services' based on your understanding.

(4 marks)

(b) Explain **THREE (3)** types of Building Services applied oftenly on building in Malaysia.

(9 marks)

(c) Based on your understanding, explain the importance of planning the Building Services during Design Process.

(6 marks)

(d) Roof design is one of a major aspect in tropical design. Explain how roof design may affect your Building Services.

(6 marks)

Q2 (a) Thermal comfort is one of the elements that determine human comfort in building. Explain the following thermal comfort variables:

(i) Air Temperature
(ii) Relative Humidity
(iii) Human Metabolism
(iv) Air Movement

(8 marks)

(b) There are two mechanism for natural ventilation which are cross ventilation and stack ventilation.

(i) Explain why wind catcher at high level is proven to be the best cross ventilation element.

(4 marks)

(ii) By using diagram, explain on how stack ventilation happen.

(6 marks)

(c) U-Value is the rate of heat transfer through a wall. Calculate the U-Value of a wall constructed by the following materials and specifications;

- External wall plaster (0.018m thick) with Thermal Conductivity (k) = 0.57 W/mk
- Brickwall (0.1m thick) with Thermal Conductivity (k) = 0.77 W/mk
- Internal wall plaster (0.018m thick) with Thermal Conductivity (k) = 0.57 W/mk
- Internal wall paper (0.006m thick) with Thermal Conductivity (k) = 0.22 W/mk

(7 marks)

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Q3 (a) You are appointed as an Architect for a development of a shopping mall. The developer requires your explanation about the differences between passive fire protection and active fire protection system. Name **THREE (3)** examples for each type of fire protection that may be used in the shopping mall.

(10 marks)

(b) Accessibility of Fire Brigade to a building is an important aspect to be considered in designing the road circulation of the building. Based on information given in **Table Q3(b)**, sketch the road circulation for a building that you have designed as an Architect with the following dimension:

- Building Length = 60m
- Building Width = 80m
- Building Height = 21m

(6 marks)

(c) Compartment walls and floors are one of the requirements for fire protection. With the help of your own sketches, explain how compartment walls and floors are applied on the following type of buildings:

(i) Single storey enclosed supermarket
(ii) High rise apartment
(iii) Linked terrace house

(9 marks)

Q4 (a) By using diagram, explain the differences between direct and indirect domestic piping system.

(8 marks)

(b) An owner of a land decided to build a small block of 5 storey apartment. Every floor will have two residential units. Advise the owner on how the piping system should be installed and state its reasons.

(8 marks)

(c) Explain the working method of the following water supply equipment;

(i) Centralized electrical water heater system.
(ii) Individual solar water heater system
(iii) Suction tank for apartment building

(9 marks)

- END OF QUESTION -

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TABLE Q3 (b)

Table of Fire Appliance Access	
Volume of Building in Cubic Meter	Minimum Proportions of Perimeter of Building
7000 to 28000	One - Sixth
28000 to 56000	One - Fourth
56000 to 84000	One - Half
84000 to 112000	Three - Fourths
112000 and above	Island Site

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