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UNIVERSITI TUN HUSSEIN ONN MALAYSIA

**FINAL EXAMINATION
SEMESTER II
SESSION 2014/2015**

COURSE NAME : BUILDING SERVICES 1

COURSE CODE : BFB 40603

**PROGRAMME : BACHELOR OF CIVIL
ENGINEERING WITH HONOURS**

EXAMINATION DATE : JUNE 2015 / JULY 2015

DURATION : 2 HOURS 30 MINUTES

INSTRUCTION : ANSWER ALL QUESTIONS

THIS QUESTION PAPER CONSISTS OF SIX (6) PAGES

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Section A: Please select the most appropriate answer to the following questions and write your answers in the answer script book.

- Q1. Green buildings are designed to;
- A. Make efficient use of all resources and improve human life.
 - B. Save energy and minimize waste.
 - C. Minimize emissions and generate savings.
 - D. Maximize the conductivity of humans and increase occupancy.
- Q2. Building services in a building are intended to provide the following, except;
- A. Healthy indoor environment
 - B. Comfortable indoor environment
 - C. Safe indoor environment
 - D. Vibrant indoor environment
- Q3. Which of the following is not the design factor that affects energy use in buildings?
- A. Macro and micro climate
 - B. Envelope fabric selections
 - C. Indoor environmental standards
 - D. Occupancy and management
- Q4. Building has a huge impact on the environment by the followings except;
- A. Energy consumption
 - B. Providing shelter
 - C. Waste production
 - D. Material consumption

- Q5. An improved microclimate around a building brings the following types of benefits, except;
- A. Longer life for building materials
 - B. Increase of rainfall in the region
 - C. Lower energy cost
 - D. Increased user satisfaction and value
- Q6. The transfer of heat energy through a material by the bodily movement of particles is called:
- A. Convection
 - B. Expansion
 - C. Radiation
 - D. Conduction
- Q7. A thermodynamic function of a system, equivalent to the sum of the internal energy of the system plus the product of its volume, is called;
- A. Thermal heat transfer
 - B. Specific latent heat
 - C. Substance expansion
 - D. Enthalpy
- Q8. Heat transfer takes place between the body and its surroundings. The direction of heat transfer may be either way, but normally a minor part of the total body heat loss takes place by this method. This statement is referring to;
- A. Latent
 - B. Solid
 - C. Sensible
 - D. Radiation

Q9. The main causes of condensation in buildings are as the following, except;

- A. Temperatures
- B. Envelope materials
- C. Use of buildings
- D. Ventilation

Q10. The principal greenhouse gases as the following, except:

- A. Methane, CH₄
- B. Carbon dioxide, CO₂
- C. Oxygen, O₂
- D. Nitrous oxide, N₂O

(20 marks)

Section C: Answer all questions.

Q1. (a) Heat transfer mechanisms can be grouped into three (3) categories, namely 1) condensation, 2) convection and 3) radiation. Differentiate each category and give appropriate examples to show how heat is transferred within a building. (15 marks)

(b) Thermal comfort in a building is established by controlling the heat gain and loss during day and night time. Justify a good passive design to establish thermal comfort in a building. (10 marks)

- Q2. (a) Name and describe **TWO (2)** of clothing and personal protective equipment (PPE) in the workplace. (5 marks)
- (b) Propose and explain **ONE (1)** of the clothing and personal protective equipment (PPE) which is compulsory in electrical works. (10 marks)
- (c) The currents I_1 , I_2 and I flowing through resistances R_1 , R_2 and R_3 in the series-parallel connection as shown in the **FIGURE 1**. Calculate the voltage (V_1), current (I_1 and I_2) and combined resistance (R_{01} and R_{02}). (10 marks)

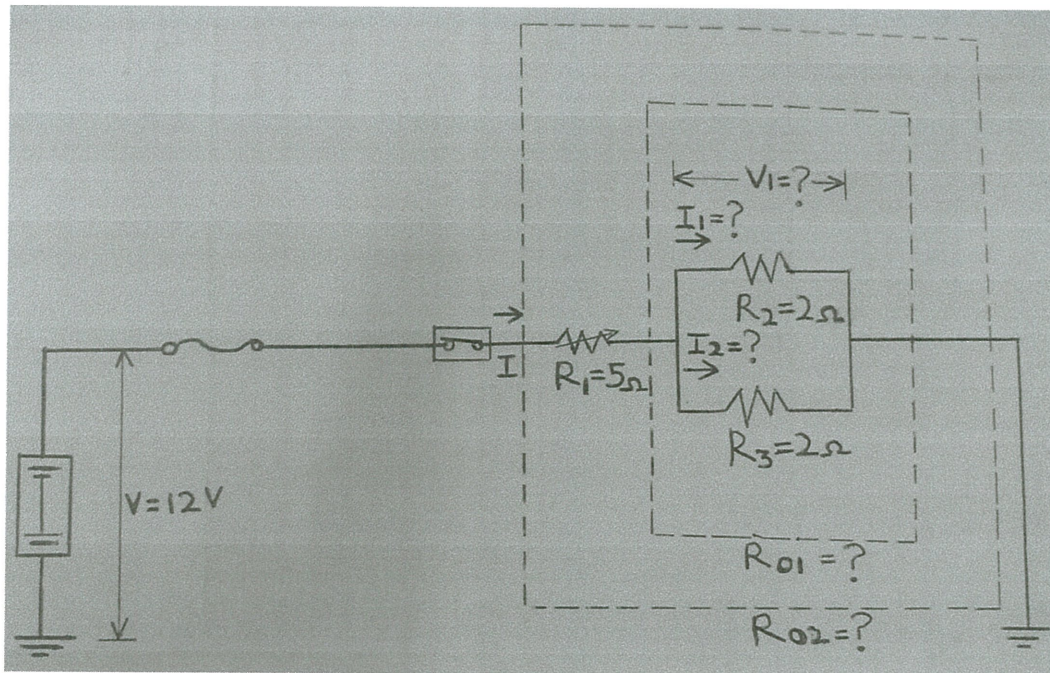


FIGURE 1

- Q3 (a) Give **THREE (3)** examples of building transportations and differentiate the movement of the transportation. (6 marks)

- (b) Sketch a basic lift system and briefly describe **FIVE (5)** functions of the components. (10 marks)
- (c) Based on lift system, differentiate between traction elevators and hydraulic elevators. (9 marks)
- (d) Give **FIVE (5)** main components of the escalator. (5 marks)

- END OF QUESTION -