UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATION
SEMESTER I
SESSION 2010/2011

COURSE NAME	:	MECHANICAL AND ELECTRICAL SYSTEM
COURSE CODE	:	BFC3153
PROGRAMME	:	3 BFF
EXAMINATION DATE	:	NOVEMBER/DECEMBER 2010
DURATION	:	3 HOURS
INSTRUCTION	:	ANSWER **ALL** QUESTIONS IN **PART A**, AND **THREE (3)** QUESTIONS IN **PART B**.

THIS PAPER CONSISTS OF FIVE (5) PAGES

Part A : Answer ALL Questions

(a) Choose the correct answers.

1. Building A has mechanical ventilation system that works by pulling the hot air in the building using propeller fans. Cold airs from outside the building sip in naturally through its window openings. What type of ventilation system that Building A uses?
   (a) Plenum system
   (b) Exhaust system
   (c) Supply system
   (d) Propeller system

2. Which of the following is not design factors that affect energy use in buildings.
   (a) Macro and micro climate
   (b) Envelope fabric selections
   (c) Indoor environmental standards
   (d) Occupancy and management

3. Air movement in wind effect occurs based on one of the following.
   (a) The blowing of the wind itself
   (b) The difference of air pressure due to the wind blow
   (c) The movement of hot air to higher location
   (d) The movement of cold air to lower location

4. Which of these statements is not true about hydraulic elevator?
   (a) Smooth traveling and accelerating system
   (b) No rooftop structure is required
   (c) Very economic on its structural construction
   (d) Using pulley to move the elevator car.

5. What is the function of a voltmeter in an electrical circuit?
   (a) Completes the circuits between two points
   (b) Measures the current between two points
   (c) Measures the potential difference between two points
   (d) Provides a by-pass for the electricity

6. Which of the following power station is not reliable to cope with peak demand?
   (a) Gas fired
   (b) Pumped storage
   (c) Nuclear power
   (d) Wind power

7. When batteries are place in a flashlight, the positive terminal is connected to the negative terminal of the next. Why?
   (a) So electricity can flow from the battery to the flashlight to a complete circuit.
   (b) So the current is slowed as it enters the next battery
   (c) So the voltage is increased as it enters the next battery
   (d) So electromagnetic interference is reduced

8. Drinking water sources can be contaminated by
   (a) naturally occurring materials
   (b) runoff from farm fields
   (c) runoff from parking lots and streets
   (d) animal wastes
   (e) all the above

9. Name the place where the water is treated to make if safe to drink?
   (a) water treatment plant
   (b) wastewater treatment plant
   (c) dry cleaners
   (d) plantation
   (e) riverside

10. What is a pit, hole, or shaft sunk into the earth to tap an underground source of water?
   (a) well
   (b) cave
   (c) black hole
   (d) tank
   (e) gully

(10 marks)

(b) Briefly define the following terms:

11. Electric Charge

12. Current

13. Voltage

14. Energy

(6 marks)

(c) Fill in the blanks.

(i) The physical comfort of humans greatly depends upon the following physical factors: ____(15)_____, _____(16)_____and____(17)____,

(ii) ___(18)____, ____(19)____ and ____(20)____ are fossil fuel burned in a furnace to heat water to make steam that in turn pushes on the blades of a turbine.

(iii) State three rules and regulations on fire safety. ____(21)____, ____(22)____ and ____(23)____.

(9 marks)

Part B

Q2 (a) Classify **three (3)** types of system for each of the following:
(i) Mechanical systems
(ii) Electrical systems

(6 marks)

(b) Differentiate between Direct Current and Alternating Current.

(4 marks)

(c) A good natural ventilation in a building is very much depended on the building design. Discuss **five (5)** design elements that may help to encourage natural ventilation on building.

(15 marks)

Q3 (a) Briefly explain **three (3)** categories of heat transfer mechanism.

(5 marks)

(b) An eight storey of condominium need to be constructed at Batu Pahat and every level has two units. As an engineer, you have to design the main water storage tank. If a unit of condominium has 2 hand wash basin, 2 showers, 1 bath, 2 WC and 1 wash up sink, calculate the capacity at the storage tank based on the required volume in Table Q3.

Table Q3: Volumes of water required for single use of appliances.

Appliance	Volume required in liters
Wash Basin:	
Hand wash	5
Hand and face wash	10
Hair wash	20
Shower	40
Bath	110
W.C.	10
Washing machine	150
Sink:	
Wash up	15
Cleaning	10

(10 marks)

(c) Briefly explain **five (5)** important factors to be considered in design numbers of elevators.

(10 marks)

Q4 (a) Stack effect is a natural ventilation phenomenon in building. Using your own words and sketches, explain how stack effect happened during hot weather.

(10 marks)

(b) Explain the differences between active fire safety system and passive fire safety system.

(5 marks)

(c) Sketch and briefly describe **three (3)** stages of electrical supply.

(10 marks)

Q5 (a) Compartmentation is part of fire safety requirements by Fire and Rescue Department Malaysia. Explain how compartmentation works as a passive fire control system.

(10 marks)

(b) List **five (5)** passive design factors affecting energy use in buildings.

(5 marks)

(c) Expalin **three (3)** types of water efficiency approach and their application.

(10 marks)