Universiti Tun Hussein Onn Malaysia

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATION
SEMESTER II
SESSION 2023/2024

COURSE NAME	:	FUEL TECHNOLOGY
COURSE CODE	:	BNG 40903
PROGRAMME CODE	:	BNG
EXAMINATION DATE	:	JULY 2024
DURATION	:	3 HOURS
INSTRUCTIONS	:	1. ANSWER **FOUR (4)** QUESTIONS ONLY 2. THIS FINAL EXAMINATION IS CONDUCTED VIA ☐ Open book ☒ Closed book 3. STUDENTS ARE **PROHIBITED** TO CONSULT THEIR OWN MATERIAL OR ANY EXTERNAL RESOURCES DURING THE EXAMINATION

THIS QUESTION PAPER CONSISTS OF **TWO (2)** PAGES

Q1 (a) There are two types of conventional engines which are spark ignition and compression ignition. Differentiate both types of engines in detail.

(15 marks)

(b) Solar power is energy from sun that is converted into electrical energy. Classify **FIVE (5)** advantages and disadvantages of this kind of energy.

(10 marks)

Q2 (a) Alcohol is currently widely used in automobiles due to its environmental advantages. Assess the suitability of the alcohol as a fuel and give **TWO (2)** types of alcohols with its specific chemical formula that usually used in automobiles.

(15 marks)

(b) Alcohol is a superior fuel to gasoline. Characterize the drawbacks of using ethanol in the spark ignition engine.

(10 marks)

Q3 (a) Natural gas is a fossil energy source that formed deep beneath the earth's surface that can be used as a fuel. Give **FIVE (5)** advantages and disadvantages of natural gas as a fuel.

(15 marks)

(b) Natural gas is a mixture of components, consisting mainly of methane with small amounts of other hydrocarbon components. Explain the properties of natural gas.

(10 marks)

Q4 (a) Point out **FIVE (5)** reasons why hydrogen gas is often preferred as a fuel in the near future.

(15 marks)

(b) List out the advantages of using biodiesel fuel in combustion engines.

(10 marks)

Q5 (a) Explain **FOUR (4)** basic elements of a Proton Exchange Membrane fuel cell.

(10 marks)

(b) Describe **THREE (3)** types of fuel cells

(15 marks)

- END OF QUESTIONS -