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UNIVERSITI TUN HUSSEIN ONN MALAYSIA

**FINAL EXAMINATION  
SEMESTER II  
SESSION 2022/2023**

COURSE NAME : FUEL TECHNOLOGY

COURSE CODE : BNG 40903

PROGRAMMECODE : BNG

EXAMINATION DATE : JULY 2023

DURATION : 3 HOURS

INSTRUCTION : 1. ANSWER **FOUR (4)** QUESTIONS ONLY.  
2. THIS FINAL EXAMINATION IS CONDUCTED VIA **CLOSED BOOK**.  
3. STUDENTS ARE **PROHIBITED** TO CONSULT THEIR OWN MATERIAL OR ANY EXTERNAL RESOURCES DURING THE EXAMINATION CONDUCTED VIA CLOSED BOOK

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

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- Q1** (a) There are **TWO (2)** types of conventional engines which are spark ignition and compression ignition. Differentiate both types 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.
- (i) Alcohol is a superior fuel to gasoline. Explain this capacity and give **TWO (2)** types of alcohols with its specific chemical formula that usually used in automobiles.  
(15 marks)
- (ii) Characterize the drawbacks of using ethanol in the spark ignition engine.  
(10 marks)
- Q3** (a) Give **THREE (3)** 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) Identify **FIVE (5)** good reasons why hydrogen gas is often preferred as a fuel in the near future.  
(15 marks)
- (b) List out **FIVE (5)** advantages of using biodiesel fuel in combustion engines.  
(10 marks)
- Q5** (a) Discover **FOUR (4)** basic elements of a Proton Exchange Membrane fuel cell.  
(10 marks)
- (b) Point out **THREE (3)** types of fuel cells.  
(15 marks)

–END OF QUESTIONS–

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