



**UNIVERSITI KUALA LUMPUR
MALAYSIAN INSTITUTE OF CHEMICAL & BIOENGINEERING
TECHNOLOGY**

FINAL EXAMINATION

OCTOBER 2025 SEMESTER

COURSE CODE	: CCB 40602
COURSE NAME	: ENGINEERS IN SOCIETY
PROGRAMME NAME	: BACHELOR OF CHEMICAL ENGINEERING WITH HONOURS
DATE	: 31 JANUARY 2026
TIME	: 9.00 AM - 12:00 PM
DURATION	: 3 HOURS

INSTRUCTIONS TO CANDIDATES

1. Please **CAREFULLY** read the instructions given in the question paper.
2. This question paper has information printed on both sides of the paper.
3. Answer **ALL FOUR (4)** questions.
4. Answer all questions in English **ONLY**.
5. Please write your answers on the answer booklet provided.

THERE ARE 3 PAGES OF QUESTIONS, EXCLUDING THIS PAGE.

(Total 100 marks)

INSTRUCTION: Answer ALL questions

Question 1

Excel Oils and Fats Sdn. Bhd. has just hired you as a Junior Process Engineer. During the commissioning of a new fractionation plant, you notice that a senior lead engineer has authorized the use of a non-standardized steam pressure relief valve to meet a tight project deadline, claiming "it's basically the same as the specified one."

- (a) Discuss your ethical obligation regarding the lead engineer's decision.
(10 marks)
- (b) For plant safety against pressure failure, name TWO international standards for Excel Oils and Fats Sdn. Bhd. to follow in design practice.
(5 marks)
- (c) Name ONE Process Hazard Analysis methodology and describe its contribution.
(5 marks)
- (d) Analyze why conducting a Pre-Startup Safety Review (PSSR) is essential prior to plant commissioning?
(5 marks)

Question 2

Global Market Competitiveness and Sustainability are discussing amount palm oil refiners in Malaysia. Palm oil refinery which do not have the certificates may have difficulty in product sales in world market.

- (a) Describe the significance of achieving Malaysian Sustainable Palm Oil (MSPO) and Roundtable on Sustainable Palm Oil (RSPO) for EU exports.
(15 marks)
- (b) Describe the role of Hazard Analysis and Critical Control Points (HACCP) in oils and fats manufacturing.
(5 marks)

- (c) Name THREE technical factors for "competitive advantage" for Malaysia palm oils industry with latest refining technology which comply to latest work market quality requirement.

(5 marks)

Question 3

You are project director for an Ethylene Monomer Plant under Petro Production Company. The company gives you a task after board meeting. You form a project team to study the feasibility of the project.

- (a) The Lead Project Engineer has just completed the Front-End Engineering Design (FEED). Descript FOUR (4) phases of critical project milestone.

(10 marks)

- (b) There is difference in mechanical completion and ready for start-up. Descript TWO (2) condition which are related to these.

(5 marks)

- (c) An Ethylene plant is a high-hazard facility. Before the introduction of hydrocarbons, a **Pre-Startup Safety Review (PSSR)** must be conducted.

- **Scenario:** During the final commissioning leak test, a small nitrogen leak is found on a flange. The Project Director is under heavy pressure to start the plant today to meet a contract deadline. He asks you to "tighten the bolts under pressure" and proceed without a full re-test.

- (i) Discuss the ethical and safety implications of this request.

(5 marks)

- (ii) As the Commissioning Lead, explain how you would formally respond.

(5 marks)

Question 4

- (a) An engineer identifies that a manufacturing plant under their supervision is releasing chemical effluents into a nearby river at levels exceeding regulatory limits. The client attempts to offer a 'consultancy fee' to temporarily ignore the

violation while corrective measures are being implemented. Propose an appropriate course of ethical action the engineer should take.

(8 marks)

- (b) A government official implies that your firm will secure a major infrastructure contract if you hire a particular 'environmental consultant,' who is the official's relative and charges twice the market rate. Upon being informed by the client's agent, evaluate the appropriate response an engineer should take in this situation.

(8 marks)

- (c) During an Environmental Impact Assessment (EIA), you identify that a proposed dam will destroy a rare ecosystem. The developer requests a "recalculation" of the data to present a lower impact, implying future lucrative contracts. This situation involves a core ethical conflict. Propose the ethical course of action an engineer should take in response.

(9 marks)

END OF EXAMINATION PAPER