



UNIVERSITI TUN HUSSEIN ONN MALAYSIA

**FINAL EXAMINATION
SEMESTER I
SESSION 2018/2019**

COURSE NAME : OCCUPATIONAL SAFETY & HEALTH
COURSE CODE : BNQ 20403
PROGRAMME CODE : BNN
EXAMINATION DATE : DECEMBER 2018 / JANUARY 2019
DURATION : 3 HOURS
INSTRUCTION : ANSWERS ALL QUESTIONS

THIS QUESTION PAPER CONSISTS OF **THREE (3) PAGES**

TERBUKA

Q1 Industrial accidents occur due to negligence towards safety aspects not only at work, but also to environment and community. For instance, Minimata tragedy was a tragic industrial accident and had affected majority of Minimata residents on neurological syndrome due to mercury poisoning, as a result of dumping waste water into Minimata bay from fertiliser company (Chisson Corporation).

For Minimata case, the fertilizer industry was built relatively close to a residential area. Hence, chemical industry area needs to be built at a safe radius, far enough from a residential area. The location of industrial project is one criterion that is assessed via Environmental Impact Assessment (EIA) during the project planning.

- (a) Describe **FOUR (4)** systematic poisoning and effects by methyl mercury to human body. (4 marks)
- (b) Describe **THREE (3)** criteria about Fault Tree Analysis (FTA). (3 marks)
- (c) Design a flow chart consisting **FIVE (5)** steps to perform FTA. (5 marks)
- (d) Assess Minimata disease using FTA. (9 marks)
- (e) Develop exposure monitoring and control for methyl mercury exposure. (4 marks)

Q2 The prime objective of an accident investigation is to prevent recurrence not to find faults. Information on events before, during and after the accident must be gathered and analysed for identifying the root causes, thus correct and accurate recommendations could be made to prevent recurrences.

- (a) One of the elements for starting the fire is heat ignition. Describe **FOUR (4)** sources of heat ignition. (4 marks)
- (b) Distillation column is commonly used in chemical process to separate chemical species by boiling point. Assess a distillation column using “Hazard and Operability review” (HAZOP) with **THREE (3)** deviations. For each deviation, describe **TWO (2)** reasonings for each of the followings: cause, consequence and action. (21 marks)

Q3 Many major industrial accidents have contributed significantly to the evolution of occupational safety and health. Lesson learnt from those incidents have initiated more stringent precautionary and preventive measures.

(a) Describe the followings:

(i) **THREE (3)** objectives of OSHA 1994 or Act 514.

(3 marks)

(ii) **TWO (2)** objectives of FMA 1957 or Act 127.

(2 marks)

(b) Identify **TWO (2)** implication and **TWO (2)** contributing factors for the following tragedies:

(c)

(i) Bhopal tragedy

(ii) Bright sparkle

(iii) Highland Tower

(iv) Chernobyl disaster

(v) Piper Alpha tragedy

(20 marks)

Q4 The past tragic industrial accidents e.g. Bright Sparklers firework tragedy, Highland Tower tragedy etc. become unforgettable history. As a result of these tragic accidents, implementation of safety and health becomes significant at workplace in preventing accidents via risk and hazard controls.

(a) List and explain **FOUR (4)** principles of operational control in prevention and control measure.

(8 marks)

(b) Demonstrate **FIVE (5)** organizational controls by management of company for OSHA practises.

(10 marks)

(c) The fire on Windsor Tower in Madrid was believed caused by a short-circuit on the 21st floor. The main factor leading to the rapid fire growth was the lack of effective fire fighting measures e.g. automotive sprinklers.

(i) Define event tree analysis (ETA).

(2 marks)

(ii) Assess Windsor Tower fire tragedy via ETA.

(5 marks)

- END OF QUESTION -