Universiti Tun Hussein Onn Malaysia

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATION
SEMESTER I
SESSION 2023/2024

COURSE NAME	:	AIR POLLUTION PREVENTION AND CONTROL
COURSE CODE	:	BFA 40503
PROGRAMMECODE	:	BFF
EXAMINATION DATE	:	JANUARY/FEBRUARY 2024
DURATION	:	3 HOURS
INSTRUCTION	:	1. ANSWER ALL QUESTIONS 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 CONDUCTED VIA CLOSED BOOK

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

Q1 (a) Briefly explain the relation of smog and haze.

(5 marks)

(b) Distinguish between ultrafine, Aitken nuclei and accumulation mode particles.

(10 marks)

(c) Comment how the physical and chemical properties of particles affect their atmospheric behavior.

(10 marks)

Q2 (a) Describe the purpose of the Environmental Quality (Clean Air) Regulations 2014.

(5 marks)

(b) With neat sketch, explain how different atmospheric conditions give rise to different kind of plume.

(10 marks)

(c) Assess **FOUR (4)** factors that the government should consider to ensure the effectiveness of regulatory instrument to control stationary and mobile air pollution.

(10 marks)

Q3 (a) Discuss the role of meteorological elements in the dispersion of air pollutant in the atmosphere.

(5 marks)

(b) Explain the importance of proper planning and zoning of industrial and residential areas from the point of air pollution control.

(10 marks)

(c) List and briefly explain monitoring techniques of stack emissions, one for emissions of particulate and one for emissions of SO_x.

(10 marks)

Q4 Sulfur dioxide is emitted at a rate of 180 g/s from stack with an effective height, H of 70 m. The wind speed at stack height is 8 m/s, and the atmospheric stability class D for the overcast day. Determine:

(a) The ground level concentration along the center line at a distance of 600 m from the stack, in micrograms per cubic meter for a rural area.

(5 marks)

(b) The concentration crosswind at 60 m from the center line for the downwind distance of 600 m.

(5 marks)

(c) The position downwind on the center line at ground level where the maximum concentration will occur, and the maximum concentration of sulfur dioxide.

(5 marks)

(d) The distance at which reflection from the stable layer just begins to occur and the concentration at a distance of $2x_L$ for an inversion layer 160 m above ground level if the atmospheric stability class is C.

(10 marks)

-END OF QUESTIONS-