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UNIVERSITI TUN HUSSEIN ONN MALAYSIA

**FINAL EXAMINATION
(TAKE HOME)
SEMESTER I
SESSION 2020/2021**

COURSE NAME : WASTEWATER TREATMENT
TECHNOLOGY

COURSE CODE : BNA 40603 / BNA 32003

PROGRAMME CODE : BNA

EXAMINATION DATE : JANUARY/FEBRUARI 2021

DURATION : 3 HOUR

INSTRUCTION : ANSWER ALL QUESTIONS
OPEN BOOK EXAMINATION

THIS QUESTION PAPER CONSISTS OF TWO (2) PAGES

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TERBUKA

- Q1** (a) Wastewater treatment processes in which the microorganisms and bacteria treating the wastes attached to the media in the reactor. The wastes being treated flow over the media. Explain the attach growth systems by giving the common practices for these systems. (6 marks)
- Q2** (a) The principle of the aerobic biodegradation is as follow: oxygen is needed by degradable organisms in their degradation at two metabolic sites, at the initial attack of the substrate and at the end of the respiratory chain. Sketch the pathway of organic matters from wastewater in an oxidation ditch system due to the presence of microorganism under aerobic conditions. (7 marks)
- Q3** (a) The F/M (food to microbes) ratio is the most useful design and operational parameter for the activated sludge system. Predict the consequences of low and high F/M. (10 marks)
- (b) Tertiary filtration is aimed at removing the fine suspended solids that are carried over with effluent in secondary clarifier. The BOD associated with the suspended solids also automatically gets removed during filtration resulting into low SS/BOD effluent. Hypothesize **TWO (2)** problems that can exist from the filtration system in tertiary wastewater treatment. (8 marks)
- Q4** (a) Wastewater was once something to dispose of, but today it's considered too valuable to waste. It is, in fact, rich in energy, nutrients, and other promising materials, not to mention the increasingly valuable resource of the water itself. As engineer technologist, provide plan recovery operation on sludge from a wastewater treatment system. (9 marks)

-END OF QUESTIONS-