UTHM
Universiti Tun Hussein Onn Malaysia

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATION
SEMESTER I
SESSION 2018/2019

COURSE NAME	:	WASTEWATER TREATMENT TECHNOLOGY
COURSE CODE	:	BNA 40603
PROGRAMME CODE	:	4BNA
EXAMINATION DATE	:	DISEMBER 2018/JANUARY 2019
DURATION	:	3 HOURS
INSTRUCTION	:	ANSWER ALL QUESTIONS

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

Q1   (a)   Differentiate between carbonaceous BOD (CBOD) and nitrogenous BOD (NBOD)

(4 marks)

(b)   Discuss **THREE (3)** environmental impacts due to pollutants from heavy metals.

(6 marks)

(c)   Biological Oxygen Demand (BOD) commonly used to quantify the amount of oxygen used by microorganisms to oxidize dissolved organic and inorganic constituents in a water.

     i.   Illustrate a typical graph of BOD for indutrial and municipal wastewater.

(5 marks)

     ii.   Evaluate the differentiation of these wastewaters with an aid of illustration described in **Q1(c(i))**.

(5 marks)

(d)   Predict the pollutant that major discharge by glue waste industry.

(5 marks)

Q2   (a)   Temperature is a major factor in determining which pollutant species are present in the wastewater. Provide **FOUR (4)** hypothesis for temperature that will influence the measurements.

(7 marks)

(b)   Plan the function of screening including design criteria for coarse and fine screens.

(6 marks)

(c)   Wastewater treatment is the process of converting wastewater or water that is no longer needed or is no longer suitable for use

     i.   Sketch the typical unit processes in treating municipal wastewater

(9 marks)

     ii.   State the objectives of pretreatment including screening and grit chamber in a wastewater treatment processes.

(3 marks)

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Q3 (a) Explain the attach growth systems by giving **TWO (2)** common practices for this systems.

(6 marks)

(b) Predict the pathway of organic matters from wastewater in an oxidation ditch system due to the presence of microorganism under aerobic conditions.

(6 marks)

(c) The F/M (food to microbes) ratio is the most useful design and operational parameter of activated sludge system. Categories the characteristic of low and high F/M.

(9 marks)

(d) Predict the problem rise by the filtration system in tertiary wastewater treatment.

(4 marks)

Q4 (a) Propose **FOUR (4)** treatment methods of sludge produced from a wastewater treatment plant.

(8 marks)

(b) Briefly classify the characteristic of sludge produced from primary and secondary clarifier in a wastewater treatment system.

(10 marks)

(c) Plan recovery operations on sludge from watewater treatment system.

(7 marks)

- END OF QUESTIONS-

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