

## UNIVERSITI TUN HUSSEIN ONN MALAYSIA

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

COURSE NAME

: WASTEWATER TREATMENT:

**BIOCHEMICAL TECHNOLOGY** 

COURSE CODE

: BNN 40703

**PROGRAMME** 

: BNN

EXAMINATION DATE : JANUARY/FEBRUARY 2021

DURATION

: 3 HOURS

INSTRUCTION

**ANSWERS ALL QUESTIONS** 

**OPEN BOOK EXAMINATION** 

THIS QUESTION PAPER CONSISTS OF THREE (3) PAGES



## CONFIDENTIAL

## BNN 40703

Q1	(a)	Describe the following terms.  (i) Digested sludge  (ii) Raw sludge  (iii) Primary sludge	
		(iii) Filmary studge	(6 marks)
	(b)	Contrast anaerobic contact process and anaerobic biofilter in terms of its biological	
		characteristics	(3 marks)
	(c)	Show how anaerobic wastewater treatment results in the effluent with reduced and COD.	
			(6 marks)
	(d)	There are possibilities of encountering failure/ disruption at UASB wastewat treatment unit where the BOD and COD removal efficiencies are much lesser that 75% and 74%, respectively. Propose FIVE (5) preventive measures in order prevent any failures associated with this unit during it's energtion.	
		prevent any failures associated with this unit during it's operation.	(10 marks)
Q2	(a)	Explain the objective of sludge stabilization.	(5 marks)
	(b)	Determine the benefits and disbenefits of	
		<ul> <li>(i) sewage sludge applications in agricultural activities</li> <li>(ii) incineration of sewage sludge</li> </ul>	
			(12 marks)
	(c)	Explain briefly what it means by composting.	(0 1 )
	(d)	Compare anaerobic digestion and aerobic digestion  (2 mark  (6 mark	
		(3 marks)	
(b)	Explain a problem associated with the application of biofilm processes and proposithe solution to the problem.  (6 marks)		
			(c)
(d)	You are an engineer at a wastewater treatment plant. A new trickling fil installed at the plant. However, there was an operation disruption		

commissioning of the new trickling filter. You have been asked by the management to investigate and produce a report regarding this matter.

- (i) Propose THREE (3) possible causes associated with the failure of the trickling filter unit operation. (6 marks)
- (ii) Propose THREE (3) solutions (Your answer must be based on the failures described in answer Q1(e)(i)) to prevent such failures from reoccurring in the future.

(6 marks)

Q4 (a) Describe what it means by nitrogen content in wastewater.

(5 marks)

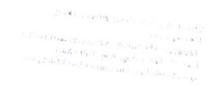
(b) You are an engineer at a wastewater treatment plant. The chemist at the wastewater treatment plant inform you that the quality of effluent have exceeded the acceptable condition of the discharge standard in term of phosphorus removal. By considering the anaerobic/oxic process, propose TWO (2) citerias that need to be investigated which you think can cause the failure in discharging the effluent which is within the accetable condition of the discharge standard in terms of phosphorus removal and propose TWO (2) solutions to prevent the problems from reoccurring in the future.

(8 marks)

(c) You are an engineer at a wastewater treatment plant. The chemist at the wastewater treatment plant inform you that the quality of effluent have exceeded the acceptable condition of the discharge standard in term of nitrogen removal. By considering the processes at the secondary treatment, propose THREE (3) citerias that need to be investigated which you think can cause the failure in discharging the effluent which is within the accetable condition of the discharge standard in terms of ni and propose THREE (3) solutions to prevent the problems from reoccurring in the future.

(12 marks)

-END OF QUESTIONS -



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