

Student Name:

ID#

University of Jordan – Dept. of Chemical Eng.
0935473 ENVIRONMENTAL ENGINEERING

FINAL EXAM

Instructor: Dr. Ahmad AbuYaghi

Time: 60 min

9:30-10:30pm

Friday 15-05-2020

Two Questions Two Pages

Do NOT Change the FORMAT of this Question Paper

Q1. Complete the Table below by filling suitable expressions in the blank spaces:

(26 marks)

Environmental Systems and Air Pollution

#	Question	ANSWER
1	Why grasslands are expected to shrink, and more desertification is also expected in Jordan in the future?	
2 is the <i>most</i> environmentally important microorganism, and it is both heterotroph and chemotroph.	
3	What is the science that is <i>most</i> important in environmental engineering: economics, geology, chemistry, political science	
4	What is a <i>sustainable</i> environmental systems?	
5	Give two examples of development projects that require <i>comprehensive</i> environmental impact assessment (EIA) study before licensing.	
6	Removal efficiency of air-borne using electrostatic Precipitator is proportional to particle size (inversely, directly)	
7	Suggest an air pollution control device good for <i>both</i> wet gas and fine particulates including corrosive chemicals	
8	Give one example on post-combustion CO ₂ <i>capture technology</i>	
9	The <i>most</i> important VOCs gas emitted to air by landfills is:	
10	Flaring is used to remove and from stack gas.	
11	If the air quality standard for CO is 35 ppm for 1-hour, what would be the acceptable standard for 24-hours be higher or less than 35ppm?	
12	Describe the stability of the atmosphere at the lapse rate of -10 °C/km	
13	Bad ozone results due to reaction of NO ₂ and VOCs from transportation and industrial emissions in the (stratosphere, troposphere)	



Q2. Complete the Table below by filling suitable expressions in the blank spaces: (24 marks)

Water Pollution and Water Treatment

#	Question	ANSWER
1	One example of compounds in wastewater that are expressed as NBOD(nitrogenous BOD)	
2	If biodegradation rate constant, $k = 0.2d^{-1}$ at $20^{\circ}C$, how much it would be $30^{\circ}C$? (Write equation used)	
T	What parameter (with units) is used to express microbiological quality of water?	
4	Name two agrochemicals causing water pollution	
5	Biodegradation of dissolved organic pollutants in surface water is slow in winter due to	
6	What device is used to measure water odor?	
7	What is <i>wrong</i> with this reaction if it occurs during removal of water turbidity using alum? $Al_2(SO_4)_3 \cdot 14H_2O \leftrightarrow 2Al(OH)_3 \downarrow + 3H_2SO_4 + 14H_2O$	
8	Why <i>twice</i> as much lime, $Ca(OH)_2$ should be added during softening to precipitate Mg compared to lime needed to precipitate Ca?	
9	Rate of disinfection using Cl_2 gas is lower at water pH.	
10	Rapid sand filters produce water with quality than slow filters (better, worse)	
11	Why natural water contains much bicarbonate and carbonate ions?	
12	Water sample containing total hardness of 115 mg/L as $CaCO_3$ and bicarbonate (HCO_3^-) of 130 mg/L as $CaCO_3$. What is the amount of non-carbonate hardness?	

SEND this word file by email to: ahmad.ay55@gmail.com at the end of the exam.

Wish you all safety and success.