Q14. Particles are suspended in a liquid medium at a concentration of 6 particles per ml. A large volume of the suspension is thoroughly agitated, and then 3 ml are withdrawn. the probability that exactly 15 particles are withdrawn are:

a. 2.179

b. 0.079

c. 1.079

d. None of these

Q15. From Stoke's law, it can be seen that the rate of sedimentation of particulate matter is strongly influenced by particle size explain that. (Answer briefly)

Q16. What are the major parameters that affecting the degree of wastewater quality?

Q17. what is the concept of the flotation process? Explain the types of the flotation with diagrams?

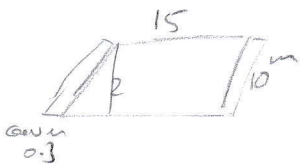
Q18. Heavy metals could be released to wastewater from many industrial activities and should be removed if the wastewater is to be reused due to their toxicity and interference with other chemicals. Suggest three treatment techniques for heavy metals removal from industrial wastewater?

Q19. Find the amount of land require in a sanitary landfill to dispose urban waste a city of 40000 in population, knowing that: waste generation = 2.5kg/capita/d, density of landfill waste= 500kg/m^3, refuse is filled into a depth of about 3m.

Q20. State the most common components of municipal solid waste. What do you think is the approximate composition of solid waste produced locally? Make sure your answers sum to 100 percent.

Good Luck

Q10. A Hazardous sanitary landfill is 500m by 250m in average plane and 15m in height. Daily filling rates are 15m by 10m by 2m and the daily cover is 0.3m. How much longer could the landfill be used if daily cover were not employed?



a. More than 3 years
b. More than 1 years
c. More than 2 years
d. More than 4 years

Q11. The Ex Situ remediation method is characterized by:

a. More expensive, require more labor and costs
b. Easier to control and has more potential for success
c. More conservative
d. All the above

Q12. The two main gases librated from an anaerobic food waste composting would include

a. Ammonia and carbon dioxide
b. Carbon dioxide and methane
c. Methane and hydrogen sulfide
d. Ammonia and methane

Q13. A sample of 12 paired x,y has given the results : $\sum x = 300$, $\sum y = 342$, $\sum xy = 9020$, $\sum x^2 = 8040$, $\sum y^2 = 11380$, the linear regression line of y on x is:

a. $y = 6.7407 + 0.8704\ x$
b. $y = 3.7407 + 2.304\ x$
c. $y = 0.8704 + 6.7407\ x$
d. None of these

Q5. What are the main deriving forces for each of the following processes?

a. Electro-dialysis
b. Forward osmosis
c. Reverse osmosis
d. Dialysis

Q6. A nonreactive contaminant is the one that does not undergo:

1. Biological reaction
2. Chemical reaction
3. Physical reaction
4. All of the above

Q7. Concentration of biodegradable organic compounds can be represented by

1. COD
2. BOD
3. TOD
4. All of the above

Q8. Streeter-Phelps equation represents the assumption of

a. Single point source of BOD
b. Steady state with plug flow
c. Constant hydrology and geology
d. All of the above

Q9. The Octanol-Water Partition Coefficient equal to:

a. Concentration in n-octanol-saturated water/Concentration in water-saturated n-octanol.
b. Concentration in water-saturated n-octanol/Concentration in n-octanol saturated water
c. None of the above

College of Engineering

Ph.D. Qualifying Exam

Environmental Engineering Department

2015-2016

Q1. The basic mechanisms for the removal of particulate matter from air are:

a. Gravitational settling
b. Centrifugal impaction
c. Inertial impaction
d. Direct interception
e. Diffusion
f. Electrostatic precipitation
g. All of the above

Q2. In cyclone separators:

a. The centrifugal force is much greater than gravitational force.
b. The gravitational force is much greater than centrifugal force.
c. The gravitational force is equal to the centrifugal force.

Q3. If V_s= exit gas velocity, U=wind speed, then stack downwash can be avoided if:

a. $V_s > U$
b. $V_s = U$
c. $V_s < U$

Q4. Suggest convenient treatment techniques for each of the followings:-

a. Recovery of sulfuric acid from the textile industry wastewater.
b. Removal of chromate from electroplating industry wastewater.
c. Removal of ammonium from fertilizers industry wastewater.
d. Removal of phosphate from plating industry wastewater.
e. Recovery of phenol from refineries.