

Q21. Units of mass transfer coefficient is

- a. m^2/s
- b. $\text{Kg}/\text{m}^2.\text{s}$
- c. m/s
- d. $\text{kg.m}/\text{s}$

Q22. Write the mathematical statement of second law of thermodynamic

Q23. Explain why for large coastal cities concentration inland is much higher than would be expected? (Answer briefly)

Q24. A rectangular sedimentation tank is designed to treat $1500\text{m}^3/\text{d}$ and if the smallest particle to be 100% removed is 0.03 mm in diameter and if $\rho_w=1000\text{kg}/\text{m}^3$; specific gravity for solid particle (SG)= 1.65 and $\mu_w=1\times 10^{-3}\text{ kg}/\text{m.s}$, find SOR ?

Q25. Two pipes have a length of (L) each one of them has a diameter of (D) and the other is (d), where ($d=D/0.5$), if the two pipes are arranged in parallel, find the ratio of the flow rates between the two pipes. Assume **no minor** losses, and the two pipes have the same friction factor (f)?

Good Luck

Q16. One of the indirect methods to solve the system of linear simultaneous equations is

- a. Cramer's Rule
- b. Matrix – Inversion method
- c. Jacobi Method
- d. Relaxation Method

Q17. The method of refuse disposal , involving burial in trenches , is called

- a. Incineration
- b. Depression
- c. Composting
- d. None of the above

Q18. Leachate is a coloured liquid , that comes out of

- a. Septic tank
- b. Sanitary landfills
- c. Shredding process
- d. All of these

Q19. Pollutants enters the region has possible fate

- a. Leave the region unchanged
- b. Accumulate within the boundary
- c. Convert to some other substances
- d. All of the above

Q20. Ecosystem is :

- a. All the populations of different species that are living together in the same area at the same time.
- b. The same species of organisms that live together.
- c. A community and its physical environment
- d. None of the above

Q11. Compaction of the soil can be measured in term of

- a. Water content
- b. Dry density
- c. Void ratio
- d. None of the above

Q12. The "hydraulic conductivity" of the sandy soil can be measured in the laboratory by

- a. Falling head permeameter
- b. Constant head permeameter
- c. None of the above

Q13. The "consequences of soil erosion" in the on- site can be represented by

- a. Removal /redistribution of soil
- b. Loss of productivity
- c. Reduction of soil functional capacity
- d. All of the above

Q14. Gussian model was used for the prediction of the concentration for :

- a. Nonreactive pollutants downwind from a point source
- b. Reactive pollutants downwind from a point source.

Q15. What is the standard unit of turbidity?

- a. NTU
- b. BTU
- c. mg/l
- d. ppm

Q6. The solution for the differential equation $\frac{dy}{dx} + y = e^x$ is

- a. $y = \frac{1}{e^x} + c$
- b. $y = \frac{1}{2}e^x + \frac{c}{e^x}$
- c. $y = \frac{1}{2}e^x + c$
- d. None of these

Q7. Put (True) or (False) for the following statements:

1. The immobilization of the (LNAPL) affected by gravitational force and hydraulic head.
2. The list (K) of hazardous waste refers to all spent halogenated solvents mixtures.

Q8. The hydraulic head in the unsaturated zone of the soil can be measured by :

- a. Piezometer
- b. Hydrometer
- c. Tensiometer
- d. None of the above

Q9. Actual velocity of the flow in the porous media is equal to:

- a. Darcy's velocity
- b. Seepage velocity
- c. Apparent velocity
- d. None of the above

Q10. Darcy's law can be applied for fluid flow in the porous media under the following condition

- a. Turbulent flow
- b. Homogeneous and isotropic flow
- c. Compressible fluid
- d. None of the above

Q3. Fill the blanks with the correct words:

1. In dissolved-air flotation system, air is dissolved in wastewater under a pressure of ----- atmospheres, followed by release of the pressure to the ----- level.

(a) single (b) several (c) double

(a) atmosphere (b) river (c) soil

2. ----- and ----- can be used as potential coagulants.

(a) hydrated aluminum sulfate (alum) (b) sodium chloride (c) ferric chloride (d) CuSO_4

3. Uniformity coefficient is the ratio of the ----- size to the ----- size in depth bed filters.

(a) 60 percent (b) 10 percent (c) 40 percent (d) 70 percent

Q4. In a wastewater treatment plant the suspended growth process is the

- a. Trickling filter
- b. Oxidation ditch
- c. Flotation
- d. Activated sludge process

Q5. If $w = xy + \frac{e^y}{y^2+1}$ then $\frac{\partial^2 w}{\partial x \partial y}$ is equal to:

- a. 1
- b. e^y
- c. $x + e^y$
- d. None of these



College of Engineering

M. Sc. Qualifying Exam

Environmental Engineering Department

2015-2016

Q1. Suggest if each of the followings is true or fault:

- a. Primary sedimentation tank should remove from 50 to 70% BOD.
- b. V_h is the settling velocity that will just produce score.
- c. Concentration gradient is driving force in the reverse osmosis process.
- d. Electro-dialysis involves the use of ion-selective membrane.
- e. Ammonia removal from aqueous solution is pH dependent process.
- f. Deep filtration can be used to remove VOCs.

Q2. Choose the right answer for each statement:

A. Anoxic process is the process of converting nitrate to nitrogen in the:

- 1- presence of O_2 2- absence of O_2 3- presence of CO_2

B. Organisms that derive their energy from chemical reactions are known as:

- 1- autotrophs 2- heterotrophs 3- chemotrophs

C. Chemical precipitation can be used for the removal of:

- 1- heavy metals 2- chlorophenols 3- suspended solids

D. Coagulation is a:

- 1- Biological process 2- Chemical process 3- physical process

E. Activated carbon material is a good:

- 1- coagulant 2- adsorbent 3- ion exchange