اللجنة الأكاديمية للهندسة المدنية

سنوات فاينل

هندسة البيئة

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سنوات مادة هندسة البيئة لكل الفصول السابقه مع فصول الاونلاين

في ميزان حسنات والديّ , نسأل الله القبول

#لجنة_المدني

#سيفلتيي

Ch5: Environmental Chemistry A

1.Minimum DO in the fresh water for the survival of aquatic life is

a)0 mg/l

b)2 mg/l

c)8 mg/l

d)4 mg/l

.2 Cadmium is one of the

a. Secondary pollutants according to EPA

b. Toxic organic water contaminant

c. Primary pollutants as classified in EPA

d. All above

.3The exposure of humans to ozone usually causing

a. lung irritation

b. pulmonary edema

c. hemolysis of red blood cells

d. damage to the kidneys

4.According to the toxicity rating for LD or LC50, the value of LD or LC50 of 0.5-5 mg/kg can be classified as ;

a. non toxic

b. moderately toxic

c. highly toxic

d. super toxic

5.ppm (parts per million – volume) is a unit for concentration and is only used for

a) liquids

b) gasses

c) collides

d) all of the above

.6 Factors that affect biodegradability of organic substances are

a) Temperature

b) Humidity

c) pH

d) all of the above

7. The following chemical reaction $NH_3 + (3/2)O_2$ ----- $NO_2^- + H_2O + H^+$ describes ;

a) Eutrophication

b) Nitrogen utilization

c) Nitrification

d) Denitrification

.8 Vinegar (الخل) a substance that has a ;

a) High pH value

b) Low pH value

c) Neutral pH value

d) Moderate acid solution

9. Catfish and bluegill can survive in temperatures ranges of ;

a. 0-50

b. 5-50

c. 10-50

d. 20-50

.10Which of the following factors will not affecting health and organisms distribution in the environment

a. Pesticide and herbicides

b. pH

c. DO

d. Freshwater quantities

11. Carbohydrates can be synthesized by animals for

a. Muscle and nerve function

b. Protein synthesis/ Enzyme activation

c. Energy storage

d. Metabolic reactions

12. Sulfur (S) is a nutrient source for animals and can be used for

a. Provide energy for cells (all organisms **.**

b. Protein synthesis and enzyme activation **.**

c. Used to make all parts of cells (cell membrane) and cell products (enzymes, hormones).

d. All of the above

13.According to the toxicity rating for LD or LC50, the value of LD or LC50 of 0.05-0.5 gm/kg can be classified as حول من غرام الى ;
ملیغرام 0.05g=50mg……. 0.5gm=500mg

a. non toxic

b. moderately toxic

c. very toxic

d. super toxic

14. Factors that affect biodegradability of organic substances are

a) Temperature

b) Humidity

c) pH

d) all of the above

15.During drinking water treatment, 17 lb. of chlorine (Cl) are added daily to disinfect 5 million gallons of water. What is the aqueous concentration of chlorine in mg/L (Hint: 1 lb = 454 gm and I gallon 3.78 = **L** (

a) **0.61** mg/l

b) **0.20** mg/l

c) 0.86 mg/l

d.0.41 mg/l=(17/5000000)*454/3.78

.16 Litmus paper at pH <6 is

a. Red

b. Blue

c. Purple

d. Orange

.17According to the toxicity rating for LD or LC50, the value of LD or LC50 of <5 mg/kg can be classified as ;

a) non toxic

b) moderately toxic

c) highly toxic

d) super toxic

.18The lower LD50 value is ;

a) the more toxic the substance

b) the lower toxic the substance

c) no relationship

d) the better for safety of public health

.19LD50 is the dose of a chemical that

a) will be fatal at a concentration of 50 mg/l

b) will accumulate and cause Chronic Toxicity at 50% of its decay life

c) EPA standard for primary pollutants

d) will kill 50% of the population it's applied to

.20 The following chemical reaction $2NO_3^+ + 12H^+ + 10e^- \text{-----} N_2 + 6H_2O$ describes ;

a) Eutrophication

b) Nitrogen utilization

c) Nitrification

d) Denitrification

21.Litmus color at pH 6-8 is

a) purple

b) red

c) blue

d) orange

22.Which of the following animals can survive and tolerate water temperature ranges between -20 to20 C **;**

a) Only bacteria survive

b) Water fish like Catfish and Bluegill

c) Water fish like Trout

d) Freshwater shrimp

23. **Magnesium (Mg) is inorganic substance used by animals for** ;

a) Muscle and nerve function

b) Protein synthesis/ Enzyme activation

c) Absorption of calcium and potassium

d) Metabolic reactions

.**24Proteins and amino acids are used for** ;

a) Provide energy for cells (all organisms **.(**

b) Used for growth and repair of tissues in organisms **.**

c) Used to make all parts of cells (cell membrane) and cell products (enzymes, hormones).

d) All of the above

Ch6: Environmental ChemistryB

1.Phosphates sources in water and wastewater can be

a.From dissolution of minerals from soil and atmosphere

b.from detergents in WW, fertilizers and insecticides from agricultural land

c.from microbial decomposition of organics

d.from decay vegetation and agriculture Lands

2.Carbon dioxide is dissolved from the atmosphere and produced by decomposition of

a. inorganic matter

b. organic matter

c.incineration of biosolids

d. corrosion of metals

3. Which of the following statement is true about (PAN)

a. Result compound containing an oxygen–oxygen (organic and inorganic)

b. It is a secondary pollutant present in photochemical smog .

c. Thermally unstable and decomposes into radicals and nitrogen dioxide gas

d. All of the above

4. Non-chlorinated refrigerants and biodegradable plastic bottles are good examples of ;

a. Considering the fate of synthesized products

b. Moral obligation of scientists to consider the consequences of their acts

c. Plastics are no longer immortal

d. All above

5. Greenhouse effect is usually attributed to anthropogenic causes, the term anthropogenic means;

a. Causes related to industrial activities

b. Causes related to man-made disturbances

c. Causes related to natural disasters

d. All above

6. Which of the following are not considered as ozone-depleting substances (ODS

a. commercial, home and vehicle air conditioners, and refrigerators ,

b. foam blowing agents ,

c. volatile organics (VOCs ,(

d. aerosol spray propellants ,

e. fire extinguishing agents

7. The pollutant is released from a source (such as a factory), and scattered in various directions through the process of ;

a. Convection

b. Dispersion

c. Deposition

d. Advection

8.Pollution associated with Solid wastes were usually best described by ;

a. chemicals can move into the soil when it rains and

b. gases from incinerators can pollute the air .

c. Multi-media pollutant

d. All above

9.Carbon dioxide residency time in the atmosphere based on comparing storage and exchange rate is ;

a. Approximately 15 years

b. Approximately 25 years

c. Approximately 30 years

d. Approximately 35 years

10.Numerous environmental concerns arise from tropospheric photochemistry. Intense tropospheric pollution can have direct effects on human health through ;

a. noxious gases such as carbon monoxide CO

b. inorganic compounds including methane CH4

c. methane hydrocarbons MHC

d.all of the above

.11The process by which one can reduce the concentration of the pollutant by mixing the polluting substance with large quantities of air or water is

a. Dispersion

b. Deposition

c. Dilution

d. Convection

12.The process of leaching is

a. Pollutants are carried through the air

b. Pollutants are scattered in various directions

c. Pollutants are carried through the soil

d. Pollutants are carried through the water

13.Ozone layer has a thickness similar to the Stratosphere which is

a) 8 - 20km

b) 12 - 30km

c) 14 - 40km

d) 16 - 50km

14. Fertilizer labels: 15-30-15 means

a) **%15** N, 30% K, 15% P

b) **%15** N, 30% P, 15% K

c) **%15** K, 30% N, 15%P

Ch7: Env Risk Assessment

1.In the Quotient Method for ERA, the Quotient equals to ;

a. Concentration producing an unacceptable environmental effect

b. Expected environmental concentration

c. Concentration producing an unacceptable environmental effect divided by Expected environmental concentration

d. Expected environmental concentration divided by Concentration producing an unacceptable environmental effect

2. Framework for Environmental Risk Assessment has the following main components

a. structural failure, chemicals toxic to humans, natural disasters, and ecosystem damage

b. complex ecological risk assessments, risk assessors and risk managers

c. dose, exposure, effects, and risk assessment

d. biological, physical, and chemical assessments

3. The general definition of Environmental Risk Assessment (ERA) is

a. human health risk assessment

b. ecological risk assessment

c. the likelihood of the occurrence / non-occurrence of adverse ecological effects as a result of exposure to hazard/ pollution sources

d. qualitative and quantitative evaluation of environmental status

Ch8:Ethics

1.Commonly, the Code of the ethics is based on broad (principles of; (4 points

1. Truth

2. hoesty

3. fairness

4. accountability

2.In this course, the environmental engineering ethics was introduced according to the guidelines stated in

a. WEEO

b. WFEO

c. WEEF

d. WEOF

3.All of the following are related to environmental engineering code of ethics except ;

a. Try with the best of their ability, courage, enthusiasm and dedication, to obtain a superior technical achievement **.**

b. Strive to accomplish the beneficial objectives of their work with the lowest possible consumption of raw materials and energy and the lowest production of wastes and any kind of pollution

c. Be aware that the principles of eco-systemic interdependence, diversity maintenance, resource recovery and inter-relational harmony

d. Reject any kind of commitment that involves damages for human surroundings and nature.

4.Ethics is generally understood as the discipline or field of study ;

a. governing principles or values which in turn are used to judge the appropriateness of particular conducts or behaviors

b. the basis and framework for responsible professional practice

c. dealing with moral duty or obligation

d. All above

Ch9: Membrane processes

1.The continued presence of toxic substances will lead to

a)Consumption of more chloride for disinfection

b)Shield pathogens and prevent killing them

c)Development of a specific bacteria capable of decomposing and utilizing toxic substances

d)Necessity for dilution as a treatment technology

2. Dialysis can be used in some industrial application and in textile production, in particular, for the recovery of;

a)Potassium hypochlorite

b)Sodium hydroxide

c)Sodium hypochlorite

d)Potassium hydroxide

3.Usually, the life span of a membrane is from;

a)1 month to 1 year

b)2 months to 2 years

c)3 months to 3 years

d)None of the above

4 . The main difficulty with the main process is that ;

a.Cannot tolerate ph variations

b. Operational costs are high specially energy

c. The rate of mass transfer is relatively small

d. Life span is relatively short

5. (in Jordan) The main difficulty with the main process is that ;

a. Cannot tolerate ph variations

b. Operational costs are high specially energy

c. The rate of mass transfer is relatively small

d. Life span is relatively short

6. Organic fouling of the membranes is usually a serious problem and require pretreatment, such problem can be resolved by;

a)Periodic replacement of the membrane
b)Increasing the applied excess osmotic pressure
c)Periodic cleaning with an enzyme detergent solution
.d)Pre-Chemical tre atment of water prior to the membrane unit

7.Electrodialysis is technically feasible method of ;

a. Demineralizing secondary effluents

b. Solving scaling problems

c. Removing organic fouling

d. Removing of many inorganic contaminants through adsorption mechanism

8. In the reverse osmosis process, the membrane is used is semipermeable, meaning it allows

a. The passage of solvent only not the solute

b. The passage of solute only not the solvent

c. The passage of solvent in selectively manner

d. The passage of both solute and solvent

9.The application of dialysis in environmental engineering is limited due to ;

a. Ionic concentration of solute

b. Low concentration difference

c. Low mass transfer coefficient

d. Low membrane transfer coefficient

10.In the Quotient Method for ERA, the Quotient equals to ;

a. Concentration producing an unacceptable environmental effect

b. Concentration producing an unacceptable environmental effect divided by Expected environmental concentration

c. Expected environmental concentration divided by Concentration producing an unacceptable environmental effect

11. A city is upgrading its water supply capacity to 81,378 m3/day, using RO technology. The new plant membrane system will consist of 25 arrays with 90 modules per array. The modules have an inside diameter of 120 mm, a length of 1,200 mm, and an available surface area of 30 m2. The membranes have an outside diameter of 1.0 mm, and a length of 1,200 mm. Determine :

a. The total surface area available for filtration ؟

A.tot= 25*90*30=67500m2

b. The membrane flux rate in L/(m2•hr)?

Fw= vol/A. available

Vol=(81375*1000)/24=3390750 L/hr

A.available = 67500 m2

Fw= vol/A. available **=3390750/67500=50.233**

c. The total number of membrane fibers required for the plant and each module.

N.fibers=A.origin*1000000/length A.origin(من السؤال معطي)=30

N.fibers =30*1000000/1200=25000

Tot.N=Nfibers*arrays*modules

Tot.N=25000*25*90=56250000

12.Organic fouling of the membranes is usually a serious problem and require pretreatment, such problem can be resolved by ;

a. Periodic replacement of the membrane

b.Increasing the applied excess osmotic pressure

c. Periodic cleaning with an enzyme detergent solution

d. Pre-Chemical treatment of water prior to the membrane unit

13.In environmental engineering, reverse osmosis is presently used and has potential for more use .

For this process, the driving force for mass transfer is ;

a. Osmotic pressure

b. Hydrostatic pressure difference

c. Mechanical pressure produced by a piston

d. Concentration gradient

14.A reverse osmosis unit is to demineralize 760 m3/day of tertiary treated effluent. Pertinent data are as follows; mass transfer coefficient = 0.207 l/(d-m2)(kPa), pressure difference between the feed and product water = 2400 kPa, osmotic pressure difference between the feed and product water = 310 kPa, lowest operating temperature = 10 deg. C (A10=1.58) and membrane area per unit volume of equipment = 2500 m2/m3, determine (6 points (

a. The membrane area required

Fw= K(ΔP-Δπ) =.207*(2400-310)=432.63

Fw=Vol/A=432.63=760/A

A=1756.69m2

A10*A=1.57*1756.69=2775.58m2

b. The space required for the equipment in m3

Vol=A/A.per.unit=2775.58/2500=1.1102m3

.15The following formula is used to ;

$$F_w = K(\Delta P - \Delta \pi)$$

a. Calculate the osmotic pressure of solutions of electrolytes

b. Calculate the mass/water flux

c. Calculate hydrostatic pressure difference

d. All above

16.The effect of temperature on the surface area of the membrane in reverse osmosis process can be described as ;

a. Direct proportionality

b. Inversely proportional

c. No effects

d. Slight increase of the membrane areas as temperatures increases.

.17The osmotic pressure for a salt solution of 35000 mg/l dissolved solids is;

a. 78 psi

b. 11.3 psi

c. 396 psi =35000*(11.3/1000)

d. 273 psi

..18 In electro dialysis, the driving force for mass transfer is

a. Hydrostatic pressure difference

b. Mechanical pressure produced by a piston

c. Electro potential

d. Valence gradient

19.In environmental engineering, reverse osmosis is presently used and has potential for more use. For this process, the driving force for mass transfer is ;

a. Osmotic pressure

b. Hydrostatic pressure difference

c. Mechanical pressure produced by a piston

d. Concentration gradient

Online (new questions)

1. Exposure to HF which is used in the manufacturing of refrigerants , herbicides , pharmaceuticals , etc causing pulmonary edema , commonly it enters humans body through ?

1- Absorption

2- Inhalation

3- Ingestion

4- Injection

2. Ozone depletion is primarily caused by ?

1- Carbon dioxide

2- Chlorofluorocarbons

3- Methane

4- Dust

3.Acid rain can be neutralized by basic soils , However , the best way to reduce or prevent acid rain in soil is by ?

1- Leaching the soil layer by adding water
2- Adding limestone to the soil
3.Adding silt to improve soil structures
4- Planting the shallow layer

4. The osmotic pressure for a salt solution of 2800 $mg\ L$ dissolved solids is ?

1- 765 KPa
2- 316.4KPa ===== $\mathbf{2800 * 11.3/1000 = 316.4}$
3- 2436KPa
4- 2184 KPa

.5Air pollution primary standards are meant to protect ?

1- Forests
2- Buildings
3- Human health
4- Animals health

6.In the prediction and estimation of Risk , assessment using the Quotient Method , if ratio of Expected environmental concentration to the concentration producing an unacceptable environmental effect is <1 then the risk is

4- Potential of high risk

2.Potential risk

3.Low risk

4.no risk

7.Which of these equations is correct ?

1. TVS+TFS=TS
2. TS-DS=SS
3. TVS+TFS=DS+SS
4. **all above**

8.Mercury is an example of toxin that classifies as ?

1- Nephrotoxin

2- Neurotoxin

3- Pneumotoxin

4- Sensitizer

9. Treated water may contains mainly () from the breakdown of sewage during treatment ?

1- Ammonia and ammonium

2- Nitrate and nitrite

3- Pathogens

4- Nitrogen or Phosphorus

10. The unit that is equivalent to 1 ppm concentration in water is ?

1- mg/L

2- $\mu g/L$

3- mg/m^3

4- $\mu g/m^3$

11.Compared with the BOD , the COD of a wastewater sample is generally ?

1- Greater

2- equal

3- less

4- No relation

12.The main purpose of performing ERA are ?

1- to determine the range and magnitude of adverse consequence and impacts of wrong practices

2- To learn and reduce the risk

3- Exposure , dose and risk management

4- to learn about natural disasters that mat occurs

13.What is flocculation ?

1- Chemical addition to the agglomeration of particles

2- Chemical addition to stabilized the destabilized particles

3- Slow mixing to agglomeration of particles

4- Forms large settlable flock

14.Ozone layer has a thickness similar to the stratosphere which is approximately ?

1- (8-20) km

2- (12-30) km

3- (14-40) km

4- (16-50) km

15.Ethics is generally understood as the discipline or filed of study that ?

1- Governing principles or values which in turn are used to judge the appropriateness of particular conducts or behaviors

2- the basis and framework for responsible professional practice

3- dealing with moral duty or obligation

4- All of the above

16.Which of the following are not considered as ozonedepleting substances (ODS) ?

1- Fire extinguishing agents

2- foam blowing agents

3- Volatile organics (VOCs)

4- erosol spray propellants

17.Multi –media pollutant means that chemical pollutants released out to the environment are strewn among the many environmental media such as ?

1- Air and water

2- **Air , water and soil**

3- Air , water , soil and vegetation

4- Air , water , soil , vegetation and radiation

18.Eutrophication can be defined as the over-enrichment of a water body with nutrients , resulting in excessive growth of organisms and depletion of oxygen concentration , which leads to the formation of ?

1- Algae clusters

2- Aerobic biodegradation

3- Swamps

4- Wetlands

19.The relation between BOD and DO concentrations is ?

1- Proportional

2- Inverse

3- Equal

4- No relation

20.(….) is measure amount of oxygen required for oxidation of all types of pollutions ?

1- BOD

2- COD

3- DO

4- A+B

21.Which of the following nutrients is consider as a plant disease resistance ?

1- Potassium

2-Nitrogen

3-Lead

4-Calcium

22.Which of the component is considered as an environmental bio-component ?

1-Access

2- Air

3- Water

4- Soil

23.Pollutants with it . The more porous the rock , the faster the pollutants will move , one of the soil parameter that affect water yield and its movement is ?

1- Permeability

2- Voids ratio

3- Effective porosity

4- Soil modulus of elasticity

24.The following chemical reaction

describes ?

1- Eutrophication

2- Nitrogen utilization

3- **Denitrification**

4- Nitrification

25.One of the spatial scale characteristics which characterized the impacts either its physical or chemical or biological is ?

1- Time

2- Duration

3- Frequency

4- **Scale**

26.The main purpose of performing ERA is ?

1- take actions to reduce the risk

2- what can go wrong with the project

3- deposition

4- determine the likelihood of the occurrence / non occurrence of adverse ecological effects

27. Assessing the scale parameter in ERA impact characteristics usually refer to ?

1- temporal scale

2-spatial scale

3-temporal and spatial scale

4- region scale

28. If 1.2 mg of dissolved O_2 is found in 200mL of water , what is the ppm of oxygen in the water ?

1- 6.4 mg/l
2-3.6 mg/l
3-2.5 mg/l

4- 6 mg/l=====(1.2/.2=6)

29. Acute Toxicity has serious symptoms after ?

1- 1 dose

2- 2 doses

3- 3 doses

4- Irrelevant of number of doses

30.Disease and mortality are commonly under which of the following components of framework for Environmental assessment ?

1- Exposure

2- Dose

3- Effects

4- Risk

31.Bio-components is evaluated during ERA studies , this component of ?

1- People , Nature , Culture and Access

2- Land , Air , Water , Energy and Access

3- Nature , Land , Water , People and Access

32.Household cleaners are substances that have a pH value of ?

1- 2

2-6

3-10

4-12

33. Substrate source for Anemone is ?

1- Soil

2- Freshwater pond

3- Rocks in the ocean

4- Snow or other freezing material

وَآخِرُ دَعْوَاهُمْ أَنِ الْحَمْدُ لِلَّهِ رَبِّ الْعَالَمِينَ

نسأل الله ان يتقبلها في ميزان حسنات والديّ

#لجنة_المدني

#سيفلتيي