


Model 2

	<b>Tanta University, Faculty of Science, Department of Chemistry</b>		
	<b>Final Exam for 4<sup>th</sup> year Chemistry Section</b>		<b>(Model 2)</b>
	<b>Course Title</b>	<b>Water treatment</b>	<b>Code: CH4127</b>
<b>21/01/2023</b>	<b>1<sup>st</sup> Semester</b>	<b>Total Assessment Marks: 50</b>	<b>Time: 2h</b>

**Q1) Choose the correct answer:**

**(20 marks, 1 for each one)**

1. Plants used phosphorus as a nutrient in the form of
  - a. Orthophosphate
  - b. hydrophosphate
  - c. phosphorus oxide
2. As the concentration of CO<sub>2</sub> in soil air increases, the pH of the groundwater
  - a. increases
  - b. decreases
  - c. doesn't change
3. For softening water,..... is added as chelating agent.
  - a. polyphosphate salts
  - b. lime-soda
  - c. soda ash
4. The chemical species in water can determine by using.....technique.
  - a. XRD
  - b. FT-IR
  - c. Ion chromatography
5. Carbon dioxide is present as a gas in each of the following except.....
  - a. atmosphere
  - b. soil pore space
  - c. rainwater
6. When lowest levels of phosphorus are needed in treated water, addition of ..... with lime is necessary.
  - a. sodium chloride
  - b. sodium fluoride
  - c. calcium fluoride
7. Plants take up ammonia and nitrogen oxides from
  - a. air
  - b. soil pore water
  - c. irrigation water
8. Evaluation of water quality depends on all of the following except.....
  - a. It's used
  - b. its chemical composition
  - c. its taste
9. Rain has virtually .....content until it reach the surface of the earth
  - a. with bacterial
  - b. no bacterial
  - c. with fungal
10. Wetlands were provided with water from all of the following except.....
  - a. rivers
  - b. groundwater
  - c. wastewater
11. All of these salts cause water less affected by acid rain except.....
  - a. carbonate
  - b. bicarbonate
  - c. sulfate
12. Removing of Manganese from water is carried out by.....

## Model 2

- a. reduction                      b. precipitation                      c. oxidation
13. The cost-effective method of removing inorganic materials from wastewater is.....
- a. distillation                      b. membrane                      c. freezing
14. TDS can be removed by
- a. flocculation                      b. ion-exchange                      c. filtration
15. Removal of dissolve organics from water must be ..... chlorination.
- a. after                      b. during                      c. before
16. ....is a natural ion exchanger.
- a. aluminum silicate minerals                      b. poly styrene                      c. Amberlite XAD-4
17. Extremely pure water is desirable in.....
- a. laboratories                      b. houses                      c. factories
18. Alum is .....
- a. hydrated aluminum sulfate                      b. aluminum sulfate                      c. hydrated sodium sulfate
19. Agriculture surface water is suitable for all of the following uses except.....
- a. irrigation                      b. livestock                      c. domestic
20. An example of organic carbon in water is.....
- a. carbonate ions                      b. bicarbonate ions                      c. cellulose

### **Q2) Give a reason for each of the following: (15 marks)**

- a) Truly pure water generally is not desirable?
- b) Using finely divided iron in groundwater treatment barriers?
- c) Treatment of water for industrial use?
- d) Removal of dissolved organics to very low levels must be done before chlorination?
- e) Measurement of the pH of water should be made in the field or very shortly after sampling?

### **Q3) Answer the following questions:**


- a) What are the sources of H<sub>2</sub>S in the environment? **(2 marks)**
- b) How the removal of nitrogen from wastewater is carried out? (Show the equations)**(8 marks)**
- c) Mention terms by them water quality standards are defined? **(5 marks)**

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*Best wishes*

*Dr. Abeer S. Elsherbiny*

## Model 1

 1969	Tanta University, Faculty of Science, Department of Chemistry		
	Final Exam for 4 <sup>th</sup> year Chemistry Section		(Model 1)
	Course Title	Water treatment	Code: CH4127
21/01/2023	1 <sup>st</sup> Semester	Total Assessment Marks: 50	Time: 2h

**Q1) Choose the correct answer: (20 marks, 1 for each one)**

- Evaluation of water quality depends on all of the following except.....
  - It's used
  - its chemical composition
  - its taste
- All of these salts cause water less affected by acid rain except.....
  - carbonate
  - bicarbonate
  - sulfate
- Extremely pure water is desirable in.....
  - laboratories
  - houses
  - factories
- Agriculture surface water is suitable for all of the following uses except.....
  - irrigation
  - livestock
  - domestic
- Wetlands were provided with water from all of the following except.....
  - rivers
  - groundwater
  - wastewater
- Rain has virtually .....content until it reach the surface of the earth
  - with bacterial
  - no bacterial
  - with fungal
- The chemical species in water can determine by using the.....technique.
  - XRD
  - FT-IR
  - Ion chromatography
- An example of organic carbon in water is.....
  - carbonate ions
  - bicarbonate ions
  - cellulose
- Carbon dioxide is present as a gas in each of the following except.....
  - atmosphere
  - soil pore space
  - rainwater
- As the concentration of CO<sub>2</sub> in soil air increases, the pH of the groundwater
  - increases
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- Plants take up ammonia and nitrogen oxides from
  - air
  - soil pore water
  - irrigation water
- TDS can be removed by

**Model 1**

- a. flocculation                      b. ion-exchange                      c. filtration
13. Plants used phosphorus as a nutrient in the form of  
a. orthophosphate                      b. hydrophosphate                      c. phosphorus oxide
14. Alum is .....
- a. hydrated aluminum sulfate                      b. aluminum sulfate                      c. hydrated sodium sulfate
15. Removing of Manganese from water is carried out by.....
- a. reduction                      b. precipitation                      c. oxidation
16. For softening water,..... is added as a chelating agent.
- a. polyphosphate salts                      b. lime-soda                      c. soda ash
17. The cost-effective method of removing inorganic materials from wastewater is.....
- a. distillation                      b. membrane                      c. Freezing
18. Removal of dissolve organics from the water must be ..... chlorination.
- a. after                      b. during                      c. before
19. ....is a natural ion exchanger.
- a. aluminum silicate minerals                      b. poly styrene                      c. Amberlite XAD-4
20. When the lowest levels of phosphorus are needed in treated water, the addition of ..... with lime is necessary.
- a. sodium chloride                      b. sodium fluoride                      c. calcium fluoride

**Q2) Give a reason for each of the following: (15 marks)**

- a) Truly pure water generally is not desirable?  
b) Using finely divided iron in groundwater treatment barriers?  
c) Treatment of water for industrial use?  
d) Removal of dissolved organics to very low levels must be done before chlorination?  
e) Measurement of the pH of water should be made in the field or very shortly after sampling?


**Q3) Answer the following questions:**

- a) What are the sources of H<sub>2</sub>S in the environment? (2 marks)  
b) How the removal of nitrogen from wastewater is carried out? (Show the equations)(8 marks)  
c) Mention terms by them water quality standards are defined? (5 marks)

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*Best wishes*  
*Dr. Abeer S. Elsherbiny*

Model 4

	<b>Tanta University, Faculty of Science, Department of Chemistry</b>		
	<b>Final Exam for 4<sup>th</sup> year Chemistry Section</b>		<b>(Model 4)</b>
	<b>Course Title</b>	<b>Water treatment</b>	<b>Code: CH4127</b>
<b>21/01/2023</b>	<b>1<sup>st</sup> Semester</b>	<b>Total Assessment Marks: 50</b>	<b>Time: 2h</b>

**Q1) Choose the correct answer: (20 marks, 1 for each one)**

1. All of these salts cause water less affected by acid rain except.....
  - a. carbonate
  - b. bicarbonate
  - c. sulfate
2. Plants used phosphorus as a nutrient in the form of
  - a. orthophosphate
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3. The cost-effective method of removing inorganic materials from wastewater is.....
  - a. distillation
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4. Removal of dissolve organics from water must be ..... chlorination.
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8. ....is a natural ion exchanger.
  - a. aluminum silicate minerals
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9. The chemical species in water can determine by using.....technique.
  - a. XRD
  - b. FT-IR
  - c. Ion chromatography
10. TDS can be removed by
  - a. flocculation
  - b. ion-exchange
  - c. filtration
11. removing of Manganese from water is carried out by .....
  - a. reduction
  - b. precipitation
  - c. oxidation

#### Model 4

12. As the concentration of CO<sub>2</sub> in soil air increases, the pH of the groundwater  
a. increases                      b. decreases                      c. doesn't change
13. When lowest levels of phosphorus are needed in treated water, addition of ..... with lime is necessary.  
a. sodium chloride              b. sodium fluoride              c. calcium fluoride
14. Agriculture surface water is suitable for all of the following uses except.....  
a. irrigation                      b. livestock                      c. domestic
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20. Carbon dioxide is present as a gas in each of the following except.....  
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**Q3) Answer the following questions:**

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*Best wishes*

*Dr. Abeer S. Elsherbiny*

	<b>TANTA UNIVERSITY</b> <b>FACULTY OF SCIENCE</b> <b>DEPARTMENT OF CHEMISTRY</b>		
	<b>FINAL EXAMINATION for 4<sup>th</sup> Year</b> <b>Double Majors Students</b>		
كلية العلوم	<b>COURSE TITLE: Bioinorganic Chemistry</b>	<b>CODE: CH4159</b>	جامعة طنطا
<b>DATE: 23 Jan., 2023</b>	<b>TERM: 1<sup>ST</sup> TERM</b>	<b>TOTAL ASSESMENT MARKS: 50</b>	<b>TIME ALLOWED: 2 HOURS</b>

**Answer all the following questions :-**

**I- Choose the most correct answer from the available selections:**

**(20 Marks)**

- 1- ..... is insoluble at physiological pH and ..... is dangerous if free because it forms free radicals.  
 A) Ferric (3+) and ferrous (2+), respectively    B) Ferrous (2+) and ferric (3+), respectively  
 C) Cobalt (2+) and cobalt (3+), respectively    D) Copper (2+) and copper (1+), respectively
- 2- Magnesium has the ability to compete with ..... for binding sites on proteins and membranes.  
 A) iron    B) calcium    C) sodium    D) potassium
- 3- ..... poisoning can lead to neurological disease and kidney failure if left untreated.  
 A) Iron    B) Mercury    C) Copper    D) Plutonium
- 4- ..... comes from a lack of vitamin B-12 (which contains a cobalt complex called cobalamin).  
 A) Anemia    B) Pernicious anemia    C) Alzheimer    D) Malaria
- 5- ..... are all paramagnetic metals that are able to alter the tissue relaxation times and produce a contrast image.  
 A) Cd(I), Hg(II), and Cu(II)    B) Ca(II), Pb(II), and Se(III)  
 C) Gd(III), Fe(III), and Mn(II)    D) A, B and C
- 6- ..... enters the plasma where it is bound to histidine and to serum albumin.  
 A) Iron    B) Copper    C) Nickel    D) Zinc
- 7- ..... agents are commonly used in metal toxicity treatment.  
 A) Oxidizing    B) Reducing    C) Chelating    D) Both A and B
- 8- Sodium ..... has been used since the early 20<sup>th</sup> century to treat rheumatoid arthritis.  
 A) vanadate    B) sulfate    C) chloride    D) phosphate
- 9- ..... complexes containing gold, silver, and copper have good anti-cancer properties.  
 A) Carbonyl    B) Chlorate    C) Phosphine    D) Cyanide

- 10- ..... has the ability to form chelates with important intracellular anionic-ligands, especially ATP.  
 A) Sodium      B) Potassium      C) Strontium      D) Magnesium
- 11- ..... is largely associated with chloride and bicarbonate in regulation of acid-base equilibrium.  
 A) Potassium      B) Sodium      C) Zink      D) Calcium
- 12- Some elements such as ..... are very similar in their inorganic chemical behavior, but they are very different in their biological activities.  
 A) sodium and potassium      B) sodium and iron  
 C) potassium and iron      D) no correct answer
- 13- ..... is a mineral found in high concentration in the body than any other mineral.  
 A) Sodium      B) Potassium      C) Magnesium      D) Calcium
- 14- Metal complexes can be used in diagnostic medical .....  
 A) for radioisotope imaging      B) as contrast agents      C) A and B      D) none of A and B
- 15- ..... utilized chiefly in the synthesis of Hb, myoglobin and certain respiratory enzymes.  
 A) Iron      B) Manganese      C) Chromium      D) Vanadium
- 16- ..... of a metal center defines its chemical reactivity as a redox center in biomolecules.  
 A) Spin state      B) Electronic structure      C) A and B      D) Density
- 17- ..... based compounds have been shown to specifically affect head and neck tumors.  
 A) Thorium      B) Uranium      C) Plutonium      D) Platinum
- 18- In intestinal mucosal cell, copper is associated with low molecular weight metal binding protein called .....  
 A) hemosiderin      B) ferritin      C) metalothionein      D) albumin
- 19- ..... carbonate often used as a phosphate binder in patients suffering from chronic kidney disease.  
 A) Iron      B) Copper      C) Lanthanum      D) Zinc
- 20- ..... poisoning can lead to gastrointestinal, kidney, and neurological dysfunction.  
 A) Sodium and potassium      B) Zink and iron      C) Calcium      D) Lead and cadmium



**II- Put a sign (✓) in front of correct sentence or a sign (X) in front of wrong one. (10 Marks)**

- 1- Metal complexes can be used in medicinal applications for only radioisotope imaging (from their emitted radiation). ( )
- 2- Increased serum calcium is found in hyperparathyroidism patients, multiple myeloma, osteolyts tumors in the skeleton. ( )
- 3- Potassium functions are different from sodium functions in the extracellular fluid. ( )
- 4- Selenium has been found to be essential for certain animals, such as cattle, and chicken. ( )
- 5- The reactivity of a metalloprotein is not affected by its coordination environment and molecular geometry. ( )
- 6- Recently metals have been used to treat cancer, by specifically attacking cancer cells and interacting directly with DNA. ( )
- 7- Known metalloenzymes number do not exceed hand fingers, until now. ( )
- 8- Factors affecting absorption of magnesium are different from those affecting calcium absorption. ( )
- 9- Iron porphyrins are present in some intracellular enzymes; respiratory enzyme systems: cytochrome oxidase, catalase, and peroxidase. ( )
- 10- The bone crystals consist of calcium phosphate hydroxyapatite  $\text{Ca}_{10}(\text{PO}_4)_6\text{OH}_2$ . ( )

**III- Explain each of the followings : (20 Marks)**

- 1- How does magnesium influences the activity of enzymes? (4 Marks)
- 2- Why has Mo (4d) rather than Cr (3d) been utilized more biologically? (4 Marks)
- 3- Iron absorption and transport in human body. (4 Marks)
- 4- The importance and function of inorganic phosphate in biological systems. (4 Marks)
- 5- Many metals play important roles in medicinal diagnosis. (4 Marks)

**With Our Best Wishes**

**Examiners: Prof. Mohamed Gaber and Prof. Abdalla Khedr**

Handwritten text in Urdu script, possibly a name or title.

$$۲۲ = ۷ + ۱۵$$