	Tanta University, Faculty of Science, Department of Chemistry		
	Final Exam of Solid State Chemistry [4 th Level] Chem-Bio, Micro, Bot, Ent, Geo, Zol, and Mat Science		
Course Title: Solid State Chemistry – جميع الشعب المذدوجه		Code: CH4143	
Date: 21-January -2023	1 st Semester		Time: 2 Hours

Part(I).....30 Marks

Answer the following:

Q1. True or False (√ & x), and if it is false correct it:20 Marks

- 1) Graphite is Sp^2 hybridization and good insulator.
- 2) Deliquescent materials are not vapor absorption matter.
- 3) Stoichiometric defects are belonging to point defect type.
- 4) Covalent crystals are bonded to each other by ionic bonds.
- 5) Interstitial defects are belonging to stoichiometric ionic solids.
- 6) Metal deficient defects are belonging to stoichiometric point defects.
- 7) Smectic liquid crystal phase is not ordered crystals.
- 8) Monoclinic crystals are maximum symmetry crystals type.
- 9) Conduction in solids is hole mechanism-only.
- 10) Liquid crystals (LC) are not obeying Bragg's law for X-ray diffraction.
- 11) Conductors have no energy gab (Eg).
- 12) n-type semiconductors are electron conduction mechanism.
- 13) Diamagnetic materials have no unpaired electron.
- 14) Polymerized crystalline arrays obey Bragg's law.
- 15) Potassium chloride is belonging to Ionic solids.
- 16) Population-inversion is the base of Laser-generation.
- 17) Semiconductors conduction is enhancing via raising of temperature.
- 18) Sol-Gel technique produces a microstructure better than other techniques.
- 19) Annealing rates controlled in the formed crystalline phases.
- 20) Volume of lattice cell is greater than volume of atoms present within lattice.

تابع باقى الاسئله..... خلف الورقه.....



QII. Write the Scientific Term/or Sentence equal to each of the following;(10 Marks)

- ❖ Allotrope
- ❖ Type of defects are present specially in ionic solids.
- ❖ Laser.
- ❖ The smaller ions are dislocated from its sites to interstitial sites.
- ❖ Bragg's law.
- ❖ Materials with the same chemical composition but differ in crystal form.
- ❖ Capability and efficiency of crystal form to insert more atoms.
- ❖ The zone in matter controlled in conduction mechanism.
- ❖ Application of electricity to produce chemical reaction.
- ❖ Crystalline Polymorphism.

Part (II).....20 Marks



QIII. Write a brief account on, Only Five Items:(10 marks)

- III.1. Photo-Voltaic Devices & Semiconducting Lasers.
- III.2. Polymorphism in iron/carbon.
- III.3. Atomic Packing efficiency (APF) .
- III.4. Doping in semiconductors (*n-type and p-type*) semiconductors.
- III.5. Techniques applied for solid state synthesis.
- III.6. Different phases of liquid crystal.

QIV. Compare with drawing between each couple of the following;.....(10 Marks)

1. Crystalline and Amorphous solids.
2. Diamond and Graphite.
3. Frenkel and Schottky defects.
4. Polymorphism in carbon and calcium silicates.
5. Linear defects, Edge and Screw dislocations.

**Best Wishes
Prof.Dr. Khaled M. Elsabawy
Professor of Materials Sciences
2023**

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

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 20th 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, possibly a name or title, written in a cursive style.

$$N^2 = 7 + 9V$$

	TANTA UNIVERSITY		
	FACULTY OF SCIENCE		
	ZOOLOGY DEPARTMENT		
Exam for senior Students of Chemistry/Entomology program			
Course title:	Ecology of freshwater insects الإمتحان في صفحاتين		Course code: EN 4149
Date: January 2023	Term: First	Degree: 100 marks	The time allowed: 2 hours

Answer the following questions:

Part I (50 marks)

1. Choose the correct answer from between the brackets (18 Marks, 2 each):

- 1.1. (Lakes – Ponds – Seas - Oceans) have several zones such as intertidal, pelagic, abyssal, and benthic.
- 1.2. Ice in winter blocks (respiration – photosynthesis – movement) in ponds and animals may die (winterkill).
- 1.3. The benthic zones of (swamps – marshes – bogs - ponds) are rich in nutrients and contain plants, numerous types of decomposers, and scavengers.
- 1.4. The (snail beetle - shore bristletail - rock springtail – water striders) is found around the tide mark of many European shores.
- 1.5. Freshwater is defined as having (less than – equal - More than) 1% salt concentration.
- 1.6. Manzala lake is considered (freshwater – saltwater – neutral).
- 1.7. Ghalyoun pond is considered one of the most important resources for fisheries in (Kafr Elsheikh – Red sea – Gharbia - South Sinai).
- 1.8. The Qattara Depression is representative of (swamps – marshes – ponds – lakes).

2. Fill in the blanks with the appropriate words (16 Marks, 2 each)

- 2.1. The chemical analysis gives.....information on water quality.
- 2.2. Estuaries are sometimes called.....habitats for many juvenile organisms, especially for fishes.
- 2.3. Five species of the genus.....live on the surface of tropical oceans.
- 2.4. Aquatic ecosystems are determined primarily by of the overlying water.
- 2.5. are small protozoans or metazoans that feed on other plankton.
- 2.6. Many rivers originate from in mountains.
- 2.7. Trout and minnows are adapted to the cold, oxygen-rich
- 2.8. Small streams alternately have swift, rocky segments (called riffles) and slow, sandy segments (called

3. Indicate if the statements are true or false with correction (16 Marks, 2 each):

- 3.1. Drainage of the manufacturing wastes in rivers has killed river organisms and made river fish inedible.
- 3.2. Detritus is the organic material that provides food for organisms at the base of the estuary's food web.
- 3.3. Mangrove swamps are coastal wetlands that occur in bays and estuaries across tropical and subtropical regions.
- 3.4. Ponds are shallow with little open water, highly acidic, with no nutrients, and mossy.
- 3.5. Wetland describes an area of land that contains a common set of streams and rivers that drains into a single larger body of water.
- 3.6. Mortality of aquatic insects is being used in field bioassay as pollution indicators.

- 3.7. The community composition of aquatic insects can reflect long-range shifts in water quality.
- 3.8. Rivers provide recreational areas for activities such as fishing, bird watching, hiking, canoeing, photography, and painting.

Part II (50 marks)

4. Indicate if the statements are true or false with correction (30 marks, 3 each)

- 4.1. Riparian buffer zones increase the pollution in the water sources.
- 4.2. Technologies aim to make people aware that they also participate in eutrophication problems.
- 4.3. The most likely mechanism that has prevented high insect diversity in marine habitats is physical stress.
- 4.4. Predation is the most common mechanism for acquiring food in specialized habitats.
- 4.5. Detritus forms a major habitat for aquatic insects in ponds and many wetlands.
- 4.6. Fish are often size-selective predators, typically eliminating large predatory taxa.
- 4.7. Some of the better-studied examples of specialized micro-habitats are subterranean environments.
- 4.8. The presence or absence of fish within a water body does not affect community structure.
- 4.9. In most streams, drift densities are much higher during daylight hours than at night.
- 4.10. Water beetles use their legs to trap surface air so that they can breathe during their dives for food.

5. Choose the correct answer from between brackets (14 marks, 2 each)

- 5.1. Drift has the potential to be important to the (distribution – dispersion - transportation) of stream insects.
- 5.2. (Engulfing predators - Odonate larvae – Stoneflies) are limited to prey small enough to be subdued and swallowed intact.
- 5.3. The presence or absence of (insects - fish - macrophytes) within a water body has a major impact on community structure.
- 5.4. Permanent habitats tend to have the (highest – lowest - occasionally) diversity of insect species.
- 5.5. In stream habitats, where *Hydra* are abundant, long hairs on the midge larva *Cricotopus sylvestris* decrease (predation risk - drift-fish attach) relative to short-haired species.
- 5.6. When fish are absent, predatory insects may control the (abundance – equitability - dispersion) of their prey.
- 5.7. Many drift studies have focused on the (importance - dangerous effect - unique property) of drift in supporting fish production.

6. Answer the following questions (6 marks, 3 each)

- 6.1. Why have Insects enjoyed only limited success in colonizing the marine environment?
- 6.2. Discuss the most important adaptations of aquatic insects in specialized habitats.

With best wishes

EXAMINERS	Prof. Dr. Ensaf Elgayar – Prof. Dr. Wesam Meshrif
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TANTA UNIVERSITY
FACULTY OF SCIENCE
DEPARTMENT OF ZOOLOGY

EXAMINATION FOR SENIORS (FOURTH YEAR) STUDENTS OF CHEMISTRY/ENTOMOLOGY

COURSE TITLE:	Biological monitoring of fresh water system	COURSE CODE:	EN 4151	
DATE :31	DECEMBER, 2022	TERM: FIRST	TOTAL ASSESSMENT MARKS:50	TIME ALLOWED: 2 HOURS

Questions in two pages الامتحان في صفتين

1. Complete the following sentences:(15 marks,3 each)

- Traditionally, water quality monitoring actions have focused onand..... measurements.
-are based on ecological surveys of the functional and/or structural aspects of biological communities.
- Bioaccumulation studies monitor theand of chemicals in the body of an organism and the consequent effects higher up the food chain.
- A is the result of an actual measurement of some characteristic or component of the aquatic ecosystem.
- Ecosystem indices doattempt to explain the reason for changes to ecosystems.

Write on the types of Reference site.

(5marks)

Explain the concept of assessment.

(5marks)

2. Fill in the blanks with the appropriate words: (20 Marks,1 for each blank)

- 1-Total dissolved solids is an important parameter for drinking water because high TDS values may result in.....
- 2- The shallow white plastic pans are used for.....
- 3- Organisms are used as early-warning devices to.....
- 4- Stream flow (discharge) is the.....
- 5- To preserve the samples we need.....
- 6- nymphs decline as temperature increases.
- 7- As particulate material including sediment increases, certain species of.....increase in relative abundance.
- 8- Pesticide runoff leads to.....
- 9- We can focus on functional groups such as.....and..... to monitor ecosystem function.
- 10- Standard physico-chemical water quality measures provide.....
- 11- Suspended solids can reduce, making it hard for fish to find prey. It also can
- 12- Ecological indicators represents the relations of
- 13 - High numbers of *Escherichia coli* might indicate
- 14- Biological assessment methods using macroinvertebrates are based on the assumptions that 1.....2.....3.....
- 15- Two of advantages of using macro invertebrates in biomonitoring are 1.....2.....

3. Indicate whether the following statements are true (T) or false (F) and correct the false one: (5 Marks)

- 1- Biomonitoring cannot entirely replace standard physico-chemical water quality methods. ()
- 2- Crayfish are tolerant category from invertebrate indicator groups. ()
- 3- Nitrogen and sulphur are two nutrients that are important to aquatic life. ()
- 4- Back end of larva of crane fly has two tiny hooks and short hairs. ()
- 5- Cold water can hold less dissolved oxygen than warmer water. ()

GOOD LUCK

EXAMINERS	DR. AHMED M. EL BOSSERY DR. IMAN M. EL HUSSEINY
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