TANTA UNIVERSITY
FACULTY OF SCIENCE
DEPARTMENT OF HEMISTRY

Examination for Fourth Year Graduation Requirements Students

	COURSE TITLE:	CHEMISTRY OF DYES		COURSE CODE: CH4208
	DATE:29/12/2020	TERM: SECOND	TOTAL ASSESSMENT MARKS: 50	TIME ALLOWED: 2 HOURS

I- Choose the correct answer (15 Points)

1. An azo dye is fixed on fabrics by the process applicable in?

a- Vat dyes
b- Mordant dyes
c- Developed dyes
d- Substantive dyes

2- Silk-Fibr on differs from wool- Keratin in that it contains?

a- No amino group
b- No carboxylic group
c- No sulpher
d- All of these

3-Which of the following is an example of basic dye?

a- Alizarin
b- Malachite green
c- Indigo
d- Orange I

4-Which of the following is not a chromophore?

a- -N=N–
b- -NO
c- $-NO_2$
d- $-NH_2$

5- The reactive dyes are applied to a cellulosic fiber in an alkaline dye bath, they form a ..... with hydroxyl group of the fiber?

a- Covalent bond
b- Salt Linkage
c- Ionic bond
d- Hydrogen bond

6-Diazotization involves a primary aromatic amine, called?

a- The azo component
b- The coupling component
c- The diazo component.
d- The amino component

7-Bathochromic groups are?

a- Groups that bring about deepening of color.
b- Groups that bring about lightening of color.
c- Positive groups.
d- Negative groups

8- Alizarin belongs to the class of?

a- Vat dyes
b- b- Mordant dyes
c- c- Substantive dyes
d- d- Reactive dyes

9- Coupling of diazonium salt with 3°amine must be in?

a- Strong basic medium
b- Slight basic medium
c- Strong acid medium
d- Slight acid medium

10- Method has been used to improve the direct dyes without increase the molecular weight after it has been absorbed by the fabric is .....?

a- Diazotization and coupling
b- metallized by metals (1:1 metal complex)
c- Anion fixing agent
d- Treatment by formaldehyde

11-Which of the following is dye?

a- Methyl orange
b- Orange I
b- Aniline yellow
d- All of these

12-The details values of the grey scale for assessing change in color are: 3 =.....?

a- Excellent
b- Good
c- Noticeable changed
d- Fair

13-Which of the following structures represents a colorless substance?

a- $C_6H_5-N=N-O-C_6H_5$
b- $C_6H_5-N=N-C_6H_5$
c- $C_6H_5-NH-NH-C_6H_5$
d- None of these

14-Which type of dye must be treated with an alkaline substance before it is used to dye textiles?

a- Acid dye
b- Vat dye
c- Direct dye
d- Basic dye

15-The bond between 1:2 metal complex azodye and wool fiber is .....?

a- Covalent bond
b- Ionic bond
c- Hydrogen bond
d- Both b, c

I- Put (T) for true and (F) for false answers in the following statements. (10 Points)

1-Acetylation of cellulose does not affect the affinity of cellulose to direct dyes.

2-The wavelength that the dye absorbs depends on its structure.

3-Basic dye is also known as anionic dye.

4-The greater the number of double bonds in the dye the more intense or darker the dye will be

5-Direct dye has direct substantively to cellulose fiber as result of physical attraction.

6-The pH level for dyeing wool with chromo acid (Premetallized acid) dyes range from (1.5-4) for 1:1 metal complex dyes while from (4-7) for 1: 2 metal complex dyes.

7-Disperse dye is soluble in water.

8-The leuco form of indigo (colorless) formed by alkylation

9-Milling acid dyes are larger molecular with higher molecular weight than leveling acid dyes. They are more wash fast than leveling acid dyes.

10- An azo dye is formed by interaction of an aromatic diazonium chloride with nitrous acid.

II-Write an account on each of the following: (25 Points)

1- Differentiation between Milling acid azodye and level acid azodye?

2- Synthesis of azo dyes including two stages namely diazotization and Coupling. ...***Explain***?

3- Name dyes with the following characteristics:

i- Cheap and easy to apply but not fast.

ii- Soluble in water and applied under acidic conditions.

iii- To which class does the synthetic indigo dye belong?

iv- Which is the most suitable dye for polyester?

4- Classification of dyes according to chromophore?

5- Relation between structure and color of dyes?

Good Luck

Prof. Dr. Hala Fawzy Rizk **Prof. Dr. Seham Abd-elatif**

	TANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT OF CHEMISTRY			
1969	EXAMINATION FOR BIOANALYTICAL DIPLOMA STUDENTS			
	COURSE TITLE:	INSTRUMENTAL ANALYSIS		COURSE CODE: CH 5103
DATE	8-3-2021	FIRST TERM	TOTAL ASSESSMENT MARKS: 60	TIME ALLOWED: 2 HOURS

Model (A) الأسئلة فى 3 صفحات

Question 1:Chose the correct answer **(1 Mark for each)**

1. According to the Beer-Lambert Law, the absorbance is independent on
a) Extinction coefficient of the sample. b) Color of the solution.
c) Distance that light has travelled through the sample. d) Solution concentration

2. The lowest amount of analyte in a sample which can be detected but not necessarily quantified is called
a) Limit of Detection b) Accuracy
c) Limit of Quantitation d) Specificity

3. In molecular fluorescence spectroscopy, fluorescence is usually collected at 90 degree from the path of the excitation light
a) Because the sample cell is usually square and emits in all directions
b) To rotate the polarization of the fluorescence
c) To make it easier to prevent excitation light from reaching the detector
d) To avoid optical rotation of excitation light

4. A Quantitative method is performed 10 times, and the results from 9 of the 10 runs agreed with each other. This method has 99%
a) Precision b) Specificity c) Sensitivity d) Accuracy

5. For matrix and background corrections in optical spectroscopic analysis
a) internal standard addition method is used b) comparison method is used
c) standard calibration method is used d) double beam instrument is used

6. A spectrophotometer that is designed so that the light intensity passing the sample is compared to the light intensity passing a reference on the same detector is
a) double beam in time spectrometer b) a single beam colorimeter
c) double beam in space spectrometer d) array spectrometer

7. The ability of a method to quantify accurately and specifically the analytes in the presence of other compounds is termed as
a) Specificity b) Precision c) Accuracy d) Sensitivity

8. A solution of copper(II) sulfate with unknown concentration is placed in a colorimeter and an absorbance of 0.46 is recorded. Using the same solution cell, a 0.055 M solution of copper(II) sulfate gives an absorbance of 0.34. What is the concentration of the first solution in mol dm^{-3}?
a) 0.074 b) 8.60 c) 0.35 d) 0.041

9. Which of the following will result in deviation from Beer's law?
a) Change in a refractive index of medium b) Polychromatic light
c) Dissociation of analyte on dilution d) Path length of cuvette

10. The correct sequence of process during atomization in atomic absorption spectroscopy is

(a) Desolvation → Nebulization→ Dissociation →Volatilization → Ionization ion

(b) Nebulization → Desolvation → Volatilization →Dissociation → Ionization ion
(c) Desolvation → Nebulization → Volatilization → Dissociation →Ionization ion
(d) Nebulization →Volatilization → Desolvation →Dissociation →Ionization

11. The generally used radiation source in atomic absorption spectroscopy, is
a) Tungsten lamp b) Xenon mercury arc lamp
(c) Hydrogen or deuterium discharge lamp d) Hollow cathode lamp

12. The fuel which is produce 3300-3400 °K in atomic absorption spectrometer is

a) Acetylene + Air b) Acetylene + Oxygen
c) Acetylene + Nitrous oxide d) Hydrogen + Air

13. The function of the atomizer in the emission system of atomic absorption spectroscopy is

a) To split the metal salt into ions b) To vaporize the sample solution
c) To break large mass of liquid into small droplets
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14. In atomic absorption spectroscopy, the absorption signal is proportional to

a) the concentration of atoms in the solid residue
b) the concentration of the free atoms in the optical path
c) the concentration of the atoms in sample solution
d) the concentration of the metal ions in the optical path

15. Inner filter effect is the fluorescence quenching due to
a) Reabsorption of excitation radiation b) Collisional deactivation
c) Reabsorption of luminescent radiation d) Both a and b

16. Which of the following source is continuous source for fluorometry
a) Deuterium discharge lamp b) Xenon arc lamp
c) Mercury vapor lamp d) Hollow cathode lamp

17. The quantitative analysis of a non-luminescent compound is done by
a) Fluorescent quenching b) Fluorescence labelling
c) Formation of fluorescent reactive product d) All of the above

18. Which of the following is a non-dispersive wavelength selector
a) Gratings b) Prisms c) absorption filters d) All of them

19. An amino acid contains a polyprotic group absorbs at different wavelengths. The sample can be analyzed at the wavelength of
a) Max wavelength b) Max absorptivity
c) Isosbestic point d) Highest pH

20. When a substance excited from a lower energy to a higher energy state
a) UV-Vis light photons are absorbed b) The spin multiplicity is not changed
c) Only photons with energy equal to the excitation energy is absorbed
d) The absorbance is changed following Beer' s law

Question 2: Answer the following **(5 Marks for each)**

(A) For determination of the zinc concentration in a serum **A**, by the method of standard calibration, a standard solution **B** is prepared with zinc chloride concentration of 0.1 mmol/L. 5.0 mL aliquot of the serum **A** were extracted with and then diluted to 25 mL by distilled water. Also, 4.0 mL, 8.0 mL and 12.0 mL portions of the standard solution **B** were diluted with water to 25 mL. The following absorbances were recorded using atomic absorption spectrometer, for the serum and the standard solutions;

No. of sample	mL of the solution B added	Absorbance reading
1	0.0	0.30
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4	12.0	0.50

Calculate the concentration of zinc in the unknown serum **A**.

(B) Sketch a well labeled double beam in space spectrophotometer, showing how it can be used for analysis of multicomponent hemoglobin?

(C) Vitamin B2 (Riboflavin) is very important for energy production to the heart, discuss how you can determine B2 in real samples.

Question 3: Which of the following statements is true and which is false?

(1 Mark for each)

1. Choice of the wavelength and slit width affect the sensitivity of spectroscopic techniques.
2. Absorption filters are light dispersing systems used in UV-VIS spectral regions to select specific spectral regions.
3. Fe^{2+} and Fe^{3+} can be distinguished in atomic absorption spectroscopic measurements.
4. Narcotics like blood alcohol can be tested photometrically for forensic control using $K_2Cr_2O_7$.
5. Fluorometry is highly sensitive technique, suitable for biological applications because it is non-dangerous non sensitive to the environment.

Question 4: Answer the following; **(5 Marks for each)**

(A) Based on the techniques you have been studied, explain how you can determine quinine in tonic water.

(B) Sketch a well labeled block diagram of an atomic absorption spectrometer. Referring to the different sources of interference which affects its sensitivity.

(C) Show how you can determine glucose in urine spectrophotometrically.

(D) Define the PI of an amino acid, and how you can determine it spectrophotometrically?

Wishing you all success

Examiners	*Prof. Tarek A. Fayed* *Prof. Ahmed f. rehab*

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Examiners	*Prof. Tarek A. Fayed* *Prof. Ahmed f. rehab*

	Tanta University – Faculty of Science – Chemistry Department		
	Final Exam for Fourth year students (Chemistry and Material Science Sections)		
	Code: (CH4123)	Course Title: Industrial Chemistry	
	January 2021		
	Date:15/3/2021	Total Assessment Marks: 100	Time Allowed: 2 h

الإمتحان يتكون من 4 صفحات

السؤال الثانى فقط يتم تصحيحه إلكترونيا

Answer the Following Questions: -

1- (a) Write the Manufacture equations for (8 Marks)

i) HOCl ii) synthetic diamond

(b) Give reasons for the following statements (12 Marks)

i) SO_3 not adds to water in manufacture of H_2SO_4

ii) White phosphorus used in military

iii) Diamond is very hard

(c) Mention the Raw materials of the following: (8 Marks)

i) NaOCl ii) White phosphorus

(d) Draw diagram for the manufacture of H_3PO_4 by wet process (4 Marks)

(e) Discuss the following points (8 Marks)

i) Different types of raw material in industrial chemistry

ii) Uses of Sulphur

2- Chose the correct answer (30 Marks) (تصحيح إلكترونى)

1- The % of the fine chemical is ----------

a) 80% b) 18% c) 2%

2- The raw materials for partial oxidation process of hydrogen manufacture are ----------

a) Methane + O_2 + N_2 b) Methane + O_2 c) Methane + H_2

3- For production of Sulphoric acid use V_2O_5 as a----------

a) Reducing agent b) oxidizing agent c) catalyst

4- Diamond is----------

a) Electrical insulator b) semiconductor c) electrical conductor

5- The High-test purity for ----------to use as propellant for rocket

a) NH_3 b) H_2 c) H_2O_2

6- Shift conversion reaction is ----------

a) CO converted to C b) CO converted to CO_2 c) CO_2 converted to CO

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7- HOCl only exist in---------

a) solution b) gas c) solid

8- Graphite has --------- density

a) low b) high c) medium

9- Red phosphorus used in match box because it changes to ---------

a) H_3PO_4 b) white phosphorus c) black phosphorus

10- Anthraquinone use in manufacture of H_2O_2 as ---------carrier

a) oxygen b) Nitrogen c) hydrogen

11- Determining the amount of hydrogen required to convert any fat into a saturated fat is.....

a) saponification Value b) cracking test c) acid hydrolysis d) unsaturation test

12- Formaldehyde is as a feedstock for ..... industry

a) Dyes b) plastic c) detergents d) explosives

13- Dehydrogenation of methanol by catalytic oxidation is an industrial method for the manufacture of .....

a) methane b) ethanol c) formalin d) acetic acid

14- Cyclohexanone is a starting material for the synthesis of .....

a) sildenafil b) aspirin c) prilocaine d) tramadol

15- ..... is the most common solvent used for vegetable oil extraction

a) ethyl acetate b) ethanol c) hexane d) methanol

16- Bleaching process in oil extraction is carried out using

a) activated clay b) sodium hydroxide c) mineral acids d) hydroperoxide

17- .... is the milligrams of pot. hydroxide required to convert one gram of the fat into glycerin and salt

a) saponification number b) iodine number c) unsaturation number d) saponification process

18- Reaction of ethyl-4-aminobenzoate with 2-(diethylamino)-ethanol in presence of sodium ethoxide is synthetic method for the preparation of .....

a) Novocain b) aspirin c) prilocaine d) lidocaine

19- Octane number could be calculated using ..... as standard mixture

a) Heptane and iso-heptane b) Octane and benzene c) Heptane and iso-octane d) Octane and hexane

20- In the synthesis of Tolycaine, the amino compound which is used is.....

a) triethyl amine b) diethyl amine c) methyl amine d) pyridine

21- .....is an undesirable component in petroleum because of its strong offensive odor

a) Oxygen b) Nitrogen c) Sulphur d) Acetylene

باقى الأسئله في الصفحة التالية

22- In soap manufacturing process, ... is added as water softener

a) brine solution b) Zeolite

c) Linear alkylbenzene sulphonic acid d) Sodium carboxymethyl cellulose

23- In vegetable oil extraction, solvent extraction method is applied to seeds with low oil content such as.....

a) sunflower b) soybeans c) Sulphur d) soybeans

24- One stage in vegetable oil processing .....

a) slurry making b) spray drying c) degumming d) sulphonation

25- One of the most common oil used for soap manufacturing is .....

a) coconut oil b) corn oil c) sesame oil d) sunflower oil

26- Electrophilic aromatic substitution reaction of ortho methoxy phenol with glyoxylic followed by oxidation and decarboxylation acid give .....

a) tramadol b) vanillin c) cocaine d) pethidine

27- The spent lye in soap manufacturing process is.....

a) brine solution layer b) $NaOH/H_2O$ layer c) brine/NaOH layer d) brine/glycerin layer

28- Synthesis gas is a mixture of.....

a) CO_2 & H_2O b) NH_3 & O_2 c) NH_3 & H_2 d) H_2 & CO

29- Glycerin could be industrially synthesized from .....

a) butene b) propene c) methanol d) acetylene

30- Sulphapyrimidine is used as .....

a) antibacterial agent b) Anesthetic agent c) antibacterial agent d) Anti-inflammatory agent

3. Mark (√) or (×) and please correct the wrong one (10 Marks)

1- In oil refining, small amount of NaOH is added to remove the remaining phospholipids.

2- Lidocaine is considered as a strong antibiotic.

3- Methane is an undesirable component because of its strong offensive odor, corrosion, air pollution by some of its compounds.

4- In oil refining, bleaching process is done by the addition of citric acid.

5- Brine solution is used during soap manufacturing for soap neutralization.

6- The starting material for pethidine preparation is aniline hydrochloride

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7- The saponification process is an exothermic process.

8- Detergents are structurally like soaps but differ in the water insoluble part.

9- Aspirin inhibits the production of cell walls of bacteria.

10- Olefins are unstable and improve the anti-knock tendencies of gasoline.

4- Explain the following (only four) (20 marks)

1- Synthesis of Sulphapyrimidine from benzene.

2- Synthesis of Pethidine.

3- Composition of petroleum.

4- Solvent extraction method for vegetable oil.

5- Synthesis of alpha-eucaine.

إنتهت الأسئله

خالص الأمنيات بالنجاح والتوفيق

أ.د/ نادية الوكيل د./ حماده مندور

Hormones BC5107(a)

Faculty of Science
Department of Chemistry
Division of Biochemistry

Final quiz for postgraduate Biochemistry Diploma Students
Saturday, March 20th , 2021 G, From 10-12 am (2 hours)
Total 60 marks (one mark for each question)

الإجابة فى نفس الورقة

Course coordinator,
Dr. Mohamed Hessien
Professor of Biochemistry

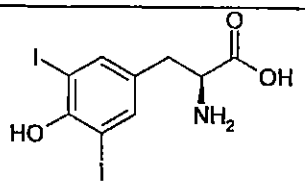

Figure 3

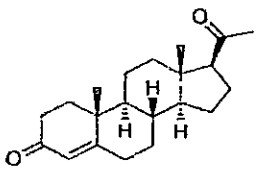

Figure 2

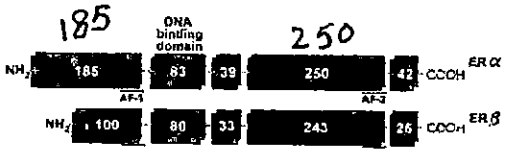

Figure1

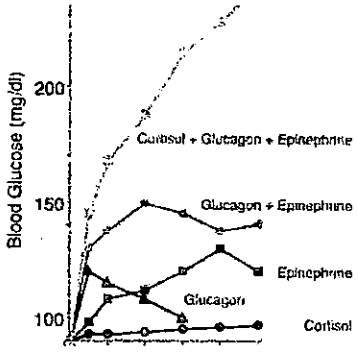

Figure 4

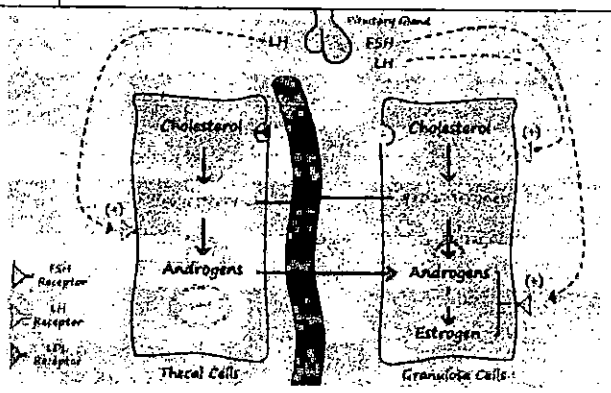

Figure 5

Section I [Multi-answer questions]. Choose the correct answers (example: BD, ABC, ABCD..etc). No partial credit will be applied. (15 marks)

	Q1	**Regarding Human chorionic gonadotropin hormone, which is correct ?** a. Produced by the placenta. b. Interacts with specific receptor on the ovary to maintain the corpus luteum. c. Allows the corpus luteum to keep secreting progesterone during the first trimester. d. Its B subunit is used to detect pregnancy (or ectopic pregnancy or cancer)
	Q2	**The chemical structures of hormones shown in Figure 1 represent:** a. DHT b. Androgens c. Testosterone d. DHEA
	Q3	**Which enzyme and co-enzyme are required DHT synthesis ?** a. 5 alfa-reductase b. NADPH c. NADH.H d. 3 alfa reductase
	Q4	**Figure 3 represents the structure of:**

		a. T3 synthesis intermediate b. Tyrosine synthesis intermediates c. T4 synthesis intermediate d. dioiodotyrosine
	Q5	**Both glucagon and epinephrine:** a. Antagonists b. Are agonists c. Have hyperglycaemic effect d. Have hypoglycaemic effect
	Q6	**Trafficing of thyroid hormones in the blood requires the folloing carriers proteins:** a. Thyroxine binding globulin (TBG). b. Thyroxine binding prealbumin and albumin. c. Insuline receptor substrtate (IRS) d. Thyroid hormone receptor
	Q7	**In figure 4 cortisol is.....** a. Enhances the hyperglycemia b. Activate unsulin c. Enhances the hyperglycaemic effect of glucagon and epinephrine d. antagonise the hypoglycemic effect of glucagon
	Q8	**Regarding the structures of FSH, LH and HCG hormones:** a. The Alfa chains are similar b. The beta chain of FSH and LH composed of 111 and 121 amino acid, respectively c. They are homodimeric proteins d. Beta chain of hCG is used in pregnancy confirmation
	Q9	**Which of the following are the common hormonal profile in woman diagnosed with POF?** a. Lack of sex steroid hormones b. High levels of gonadotropins c. Normal LDH and high MB CK d. High T4 and low TSH
	Q10	**Which of the following represent the functions of HCG hormone?** a. Induces the spermatogenesis b. Maintain the corpus luteum during the pregnancy. c. Allows the corpus luteum to keep secreting progesterone during the first trimester. d. Its B subunit is used to confirm or exclude the pregnancy
	Q11	**Which of the following represent hormone physiological effects?** a. Involved in unwinding the DNA during replication b. Control the growth, reproduction & maturity c. Regulation of the metabolism). d. Control the functions of organs
	Q12	**In adult female, If the egg is not fertilized.....** a. The corpus luteum stops secreting progesterone b. Decays (after about 10 days). c. Degenerates into corpus albicans (mass of fibrous tissue). d. Decays (after about 2 days).
	Q13	**Which of the following hormones are physiologically related** a. GnRH b. GnIH c. PRH d. LH
	Q14	**Structurally, which of the following hormones are heterodimers?** a. CCK b. LH c. FSH d. HCG
	Q15	**Which of the following cells have similar population in the anatomy of the anterior pituitary?**

		a. Lactotrophs b. ACTH secreting cells c. Gonadotroph d. Thyrotophs

Section II : Choose the correct answer (Regular MCQs, single answer is required) (25 marks)		
	Q1	**Which hormone stimulates the growth of ovarian follicles before the release of egg?** a. DHT b. HCG c. LH d. FSH
	Q2	**Figure 2 represents the chemical structure of:** a. Progesterone b. Androgen c. Estradiol d. Cortisone
	Q3	**The hormonal events shown in figure 5 take place.....** **a. After ovulation** **b. Before ovulation** **c. During the release of LH** **d. At the end of pregnancy**
	Q4	**The largest domain in figure 1 (estrogen receptor) is called.....** **a. LBD** b. DBD c. Hinge region d. ligand
	Q5	**Before ovulation the basement membrane prevents cholesterol to reach:** **a. Granules cells** **b. Thecal cells** **c. Corpus luteum** **d. Uterus**
	Q6	**DHEA is synthesised in the adrenal cortex in the:** a. Zona granulosa b. Zona glomerulosa c. Zona fasciculate d. Zona reticularis
	Q7	**In healthy 25 years old woman, When the highest level of LH is observed?** a. Just after the ovum release at day 28 b. During the early follicular phase c. During the last 3 days of the menstrual cycle d. Just before the release of ovum from the follicle
	Q8	**Pancreatic hormones include the following list of hormones:** a. Insulin, glucagon, somatostatin and amylin b. Insulin like growth factor, glucagon, somatostatin and amylin c. Insulin, glycogen, somatostatin and amylin d. Insulin, glucagon, thyroxine and amylin
	Q9	**The ACTH is a peptide hormone consists of a peptide chain composed of:** a. 931 amino acids b. 39 amino acid c. 93 amino acids d. 139 amino acids
	Q10	**Permissiveness of the endocrine effect means that:** a. One hormone cannot exert its effects without another hormone being present b. More than one hormone produces the same effects on a target cell c. One or more hormones opposes the action of another hormone

		d. One hormone induces its effect in absence of receptor on/in the target cells
	Q11	**Vasopressin and oxytocin are:** a. Posterior pituitary hormones b. Anterior pituitary hormones c. Thyroid hormones d. The first is anterior and the second posterior pituitary hormones
	Q12	**Why hormone are regulated ? Because ....** a. They are required until the physiological effect is established. b. They are required in a very huge amounts c. Their action depends on the distance between its source and the target cell d. They are not regulatory molecules.
	Q13	**During the 2nd 14 days of the uterine cycle hormones are co-regulated?** a. Progesterone and estrdiol b. Progesterone and FSH c. Gonadotropins d. Estradiol and, FSH and LH
	Q14	**Catecholamine, ACTH, FSH, LH, PTH, and TSH hormones use..... as a second messenger.** a. G-proteins b. Membrane receptor c. cAMP d. intracellular receptor
	Q15	**Which of the following hormones is responsible for decidualization of endometrium?** a. Dehydrotestosterone b. GH c. Progesterone d. FSH
	Q16	**Which of the following hormones has no coding genes?** a. Thyroxin b. Insulin c. LH d. GH
	Q17	**Epinephrine and nor epinephrine are released from:** a. Adrenal cortex b. Adrenal medulla c. Paratyphoid hormones d. Anterior pituitary
	Q18	**Which of the following is relevant to thyroid hormones biosynthesis?** a. H2O2 b. Iodine c. Thyroglobulin d. All the above
	Q19	**Growth hormone-releasing hormone is.....and targets somatotropes in the anterior pituitary.** a. Adrenal hormone b. Hypothalamic hormone c. Pituitary hormone d. Thyroid hormone
	Q20	**Pancreatic hormones include the following list of hormones:** a. Insulin, glucagon, somatostatin and amylin b. Insulin like growth factor, glucagon, somatostatin and amylin c. Insulin, glycogen, somatostatin and amylin d. Insulin, glucagon, thyroxine and amylin
	Q21	**According to hormone structural classification, both Cortisol and Estrogen are:** a. Peptide hormones b. Steroid hormones c. Amino acid derived hormones

		d. Small neuropeptides
	Q22	**Lipogenesis process is ..... by insulin hormone:** a. Increased b. decreased c. not affected d. all answer are not correct
	Q23	**The iodination of tyrosine amino acid takes place in the:** a. Thyroid follicles b. Thyroid cells c. Parathyroid d. Hypothalamus
	Q24	**Which of the following derive(s) the primordial follicle into primary follicles?** a. Anti-mullerian hormone b. Stem cell factor c. Fibroblast growth factors d. Both Stem cell factor & Fibroblast growth factors
	Q25	**Which of the following derive(s) the primary follicles into 2ry follicle?** a. Activin b. Stem cell factor c. FGF d. All the above

Section III: Decide if the following statements are correct (√) or incorrect (X) (10 marks)		
Q1		In the ovaries, LH binds to receptors on Leydig cells, stimulating synthesis and secretion of testosterone.
Q2		All tissues of the endocrine system are glandulare pithelial tissues
Q3		DM is a metabolic disorder manifested by abnormal glucose level and lipids
Q4		In hormonal mechanism of action, Adenylate cyclase generates cAMP as a second messenger from ATP
Q5		The role of peroxidase in T4 biosynthesis is the oxidation of iodide to [I*] by H2O2
Q6		The affinity of Thyroid hormoneeceptors to T3 is higher than T4
Q7		GHRH .is an anterior pituitary hormone and targets somatotropes in the thyroid gland to release T3 and T4.
Q8		The parathyroid is located in the middle of the base of the brain at the bottom of the 3rd ventricle
Q9		The main role of insulin in muscles and liver cells is to internalize the glucose transporter inside the cytoplasm
Q10		Both adrenocorticotropic hormone and Corticotrophin-releasing hormone are feed-back inhibited by Gonadotropins

Section IV: Do as show corresponding to each question (10 marks, 2 marks each)	
Q1	**Explain why Endocrine glands are rich blood and lymph vessels** Answer :
Q2	**Correct:** All steroid hormones are released from 3 sources including: testes, ovaries and Adrenal medulla **Answer** .....
Q3	**Correct:** Free T4 level in serum is much higher than total T4 level **Answer:**.....
Q4	**Correct:** Vasopressin and Oxytocin are anterior pituitary hormones having different peptides with the same length. **Answer** .....
Q5	**Complete: After ovulation and subsequent fertilization, the follicle seals itself and forms what is known as:** .....

End of questions

Dr. Mohamed Hessien,
Professor of biochemistry

b

	TANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT OF CHEMISTRY			
	FINAL EXAM FOR FORTH STUDENTS (CHEMISTRY & MATERIAL SCIENCE) الكيمياء وعلوم المواد			
1949	COURSE TITLE:	APPLICATION OF POLYMER		COURSE CODE: CH4222
DATE:	DECEMBER 30TH 2020	TERM: فصل اول متطلبات تخرج P	TOTAL ASSESSMENT MARKS: 100	TIME ALLOWED: 2 HOURS

1) **Discuss the following** **(20 marks)**

   a) **Plasticizers are used to achieve property changes, explain.**

   b) **Antimicrobial agents as additives to polymers.**

2) **Controlled release technology (CR), and the benefits of CR?** **(10 marks)**

3) **A- Write the chemical structure of natural rubber, Acrylonitrile and butadiene. (10 marks)**

   B- Drug properties requirements for controlled release.

4) **Put the sign (√) or (X) in the front of each statement** **(20 marks)**

   a) **Thermal stabilisers such as lead salts, metal soap, does not help in processing PVC** **( )**

   b) **The flame retardant causes a gaseous product to evolve on igniting the plastic which dilutes the combustible gases evolving.** **( )**

5) **Write short notes on the methods of characterization of hydrogel** **(20 marks)**

6) **Answer the following:** **(20 marks)**

   a) **Preparation of hydrogel.**

   b) **Polymer properties and therapeutic requirement which should be considered in designing a controlled release system.**

With best regards,

EXAMINER PROF. EL-REFAIE KENAWY
DR. MOHAMED AZAAM

	TANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT OF CHEMISTRY			
	FINAL EXAMINATION for All Branches(CH/MB, CH/EN, ZO)			
	COURSE TITLE:	POLYMER CHEMISTRY		COURSE CODE: CH 4244
DATE:	30 DEC 2020	TERM: FIRST	TOTAL ASSESSMENT MARKS: 50 DEGREE	TIME ALLOWED: 2 HOURS

1) Write the **name** & **structure** of monomers for each of the following polymers: **(10 marks, 2 marks for each)**

a) Polycarbonate,
b) Alkyd resin,
c) Nylon 610,
d) Epoxy resin,
e) Hard & Elastic polyurethanes,

2) Write short notes on the following: **(10 marks, 5 marks for each)**

a) Phenol-formaldehyde resin,
b) Isomerization polymerization,

3) How can you prepare the following: **(10 marks, 5 marks for each)**

a) Suspension polymerization,
b) Ion exchange resins.

4) How can you prepare the following: **(10 marks, 5 marks for each)**

a) Block copolymers.
b) Vulcanized rubber,

5) Choose the correct answers: **(10 marks, one mark for each)**

i) Polymer formed by the polymerization of hexamethylene diamine & adipic acid is:

a) Nylon-610,
b) Nylon-66,
c) Bakelite.

ii) Which of the following is common anionic initiator?

a) Sodium metal,
b) Azobisisobutyronitrile,
c) Dibenzoyl peroxide.

iii) Polymer obtained by the polymerization of two different types of monomers is:

a) Homopolymer,

b) Heteropolymer,
c) Copolymer.

iv) What is the type of the polymerization used for the formation of polystyrene?
a) Fast polymerization,
b) Addition polymerization,
c) Condensation polymerization.

v) What are the monomers used for the formation of polyurethane?
a) Isobutylene & isoprene,
b) Diisocyanate & diol,
c) Phenol & formaldehyde.

vi) Disproportionation of polymer propagating chains yields:
a) One polymer chain with long length,
b) Two polymer chains with short length,
c) Three polymer chains.

vii) Which of the following is the characteristic of thermoplastic?
a) Cross-linking between chains,
b) Can not be molded,
c) Can be melted.

viii) What is the characteristic of cross-linked polymers?
a) Solubility in organic solvent,
b) Melting on heating,
c) Insolubility in all solvent.

ix) Which of the following is true regarding addition polymerization?
a) Monomers contain two functional groups,
b) The reaction mechanism involves initiation, propagation & termination,
c) Polyamides & polyesters are polymers of this type.

x) What is the type of the polymerization of styrene with BuLi?
a) Ring-opening,
b) Condensation,
c) Living.

With best regards,

EXAMINER	DR. AHMED AKELAH	

Tanta University
Faculty of Science
Department of Chemistry

Final Examination of dyes for graduation requirements credit hours
Course Code: CH4208

December 29 th 2020 **Total Assessment Marks: 50** **Time Allowed: 2 Hours**

1- Write notes on the following points: (26 Points)
a- Chemical forces responsible for dyeing different fibers. (With examples)
b- Tautomeresim in hydrazo and aminoazo dye compounds.
c- Differentiation between Milling acid azodye and level acid azodye.
d- Reactive dyes
e- Dyeing technique of nylon fiber by disperse azodye.

2- Mark (√) or (×) and explain your answer: (12 Points)
a- Acetylation of cellulose does not affect the affinity of cellulose to direct dyes.
b- The auxochrome chemical group in dye molecule is the color producing group of the dye
c- The vat dyes are soluble in water and considered the best technique used in azo dyes.
d- The bond between acid azodye and wool fiber is covalent bond.
e- Nylon is considered as natural fiber and it can be dyed with reactive dyes.
f- Dyestuffs used for dyeing wool can be used to dye polyester fibers.

1- Choose the correct answer from the alternatives given in each of the following questions: (12 points)
a-The greater number of double bonds in the dyes
i-The more water soluble it is. ii- The more intense or darker the pigment will be.
iii- The weaker the dye color will be.

b- Dyeing process of reactive dye on cotton are carried out in
i- Alkaline medium ii- Acid medium iii- Neutral medium

c- Silk-Fibron differs from wool- Keratin in that it contains
i-No amino group ii-No carboxylic group iii-No sulpher

d- Which of the following is an example of basic dye
i-Alizarin ii-Malachite green iii-Indigo

e- Diazotization involves a primary aromatic amine, called:
i-The azo component ii- the coupling component iii-The diazo component.

f- Method has been used to improve the direct dyes without increase the molecular weight after it has been absorbed by the fabric is .....
i-metallized by metals (1:1 metal complex) ii-Anion fixing agent
iii- Treatment by formaldehyde

EXAMINER PROF.DR. HALA FAWZY RIZK

	Tanta University, Faculty of Science, Department of Chemistry		
	Final Exam for 4th year Chemistry		
	Course Title	**Environmental Chemistry**	Code: **CH4224**
31/12/2020	1st Semester	Total Assessment Marks: 50	Time: **2 *hrs.***

Q1- Discuss the following: (15 marks)

a- Primary and secondary pollutants

b- Perfluorinated organic compounds

c- Environmental Effect of pesticides

d- Adsorption of dyes

e- Toxicity of organochloride compounds

Q2- Discuss with equations: (10 marks)

a- Formation of peroxy-acetyl nitrate

b- Depletion of ozone layer

c- Formation of nitric acid and sulphuric acid in the atmosphere

d- Photochemical smog

e- Formation of aldehyde and ketones in the atmosphere

Q3-Complete the following Sentences: (10 marks)

a-..... consists of the solid earth, including soil, which supports most plant life.

b- ..... is a vital first step in environmental chemistry research.

c-Materials cycles may be divided broadly between ..... and.....

d-..... is due to the presence of calcium and bicarbonate ions in water.

e-..... is a common water pollutant that contains an appreciable concentration of free mineral acid.

f- ..... its thin outer skin composed largely of lighter silicate-based minerals.

g-..... is a substance present in greater than natural concentration as a result of human activity that has a net detrimental effect upon its environment.

h-..... is the maximum dissolved oxygen concentration at equilibrium

i- .....contains Earth's water.

Q4- Explain in briefly:

a) Oxygen cycle? **(6 marks)**

b) How will the temperature affect on the solubility of oxygen in water? **(3-marks)**

Q5- Mention in Briefly the effects of poisoning by each of the following on humans:

a) Cadmium **(2-marks)**

b) Mercury **(4-marks)**

End of the questions

Best Wishes
Dr. Abd El-basst Ibrahim
Dr. Abeer S. Elsherbiny

	TANTA UNIVERSITY FACULTY OF SCIENCE CHEMISTRY DEPARTMENT		
	FINAL EXAM FOR SENIOR STUDENTS (ALL MAJORS)		
COURSE TITLE:	ENVIRONMENTAL CHEMISTRY (CH4224)		TIME ALLOWED:
DATE: DECEMBER 31, 2020	TERM: FIRST	TOTAL ASSESSMENT MARKS: 50	2 HOURS

Question 1. Write short notes on the followings: **(10 Marks)**

a) Effects of perfluorinated organic compounds in the environment.

b) Removing processes of dyes from wastewater.

c) Toxicity of dioxins and dioxins like compounds.

d) Natural sources of hydrocarbons in the atmosphere.

e) Environmental effect of pesticides.

Question 2. Show with equations the following: **(15 Marks)**

a) Formation of smog in the atmosphere.

b) Effect of CFCs compounds on ozone layer

c) Formation of proxy acylnitrate in the atmosphere

d) Formation of both HCl and HNO_3 in the atmosphere.

e) Formation of aldehydes in the atmosphere.

Question 3. A) Define the following: **(25 marks)**

1) Oxygen solubility.
2) Troposphere.
3) Biogeochemical cycles.
4) Pollutant and contaminant.
5) Total acidity of water.
6) B) Explain with equations the types of atmospheric photochemical processes.

C) Compare between each of the following pairs:

1) Phenolphthalein alkalinity and total alkalinity of water.
2) Endogenic and exogenic cycles. (only with diagram)
3) Sources of oxygen and carbon dioxide in water.
4) Troposphere and stratosphere.

With Best Wishes

Examiners: Dr. Abd El-Basit M. Shokr Dr. Wael A. Amer

	Final exam of Selected Topics in Organic Chemistry For fourth year students. Chemistry section			
	Date: 6/1/2021	**Code: CH4125**	**Marks:100**	**Time: 2Hrs.**

Section A: **(50 Marks)**

1-Compare and contrast the reactions of each; (Name all products) (30 Marks)

2-Thiohydantoin and 5-phenyl-1,3,4-oxadiazole-2-thione with each of the followings;

a- Oxygen **b-** α-bromoacetic acid/KOH **c-** HCHO and CH_3NH_2 (Mannich reaction), **d-** Ph_2CN_2 (dipenyl diazomethane) **e-** 9-Diazofluorene, **f-** α-acetobromo glucose/ KOH (accompanied by oxidation and hydrolysis of the products), **g-** Methylamine **h-** CH_3I followed by oxidation.

2- Give the reaction products of the followings: **(10 Marks)**

Reaction of Lawessen's reagent (L.R) with;

i- Methyl vinyl ketone ii- Anthranilic acid

iii- Ethylene glycol and 1,4-dihydroxy benzene

3- Mention Two methods for preparing the followings: **(10 Marks)**

a- 2-Thiohydantoin. b- 1,3,4-Oxadiazoles.

Section B: Steroids, Vitamins, Alkaloids and Terpenes **(50 Marks)**

1-Carry out the following conversions: **(15 Marks)**

i- α-Naphthyl ethyl magnesium bromide to Diel's hydrocarbon.

ii- Cholesterol to 1',7-dimethyl-1,2-cyclopentanophenanthrene.

iii- Ergocalciferol to methyl isopropyl acetaldehyde.

iv- p-Anisaldehyde to Stilbesterol.

v- Ethyl acetoacetate to α-Terpic acid

2- By chemical equations, how can you elucidate the following; **(10 Marks)**

a- Position of the double bond in cholesterol.

b- Ozonolysis and Deil's Alder reactions of ergosterol and ergocalciferol.

3-Draw the following structures: **(10 Marks)**

i- Vit. B_1 ii- NAD iii-Biotin (Vit.H) iv- α-Terpinol v- Piperine

4- Mention one method for preparing the followings: **(15 Marks)**

a- Conine b- α-Terpinol c- Vit.B_6 d- Progesterone

مع اطيب الامانى بالتوفيق

Prof.Dr. Ahmed El-Barbary ***Dr.*** Mohamed Sadek

14) A baby developing in the womb has _____immunity because it receives _____ antibodies from its mother.

a)naturally acquired passive; IgG b) antibody-mediated; IgM
c)naturally acquired passive; IgE d naturally induced active; IgA

15)Which of the following are most numerous in blood:

a)Lymphocytes b) neutrophils c) Monocytes d) Eosinophils

II- Put (√) in front of correct statement and (X) in front of incorrect ones: (15 Marks)

1- If you had 200 V and 5 J regions in a light chain and 300 V, 10 D, and 5 J regions in a heavy chain, you could have exactly 1,000 antibody specificities
2- Screening tests would be most useful for confirming a presumptive diagnosis of a congenital absence of a complement componentquantitation of serum opsonic activity
3- Complement is required for lysis of erythrocytes by specific antibodies
4- In the human thymic cortex may be found T cells with the CD2 marker
5- T cells differ from B cells by) their lack of antigen-specific receptors
6- The first immunoglobulin synthesized by the fetus is IgG
7- The following activate(s) the alternative pathway of complement endotoxin
8- The antibody isotype that acts in concert with lysozyme against gram-negative organisms is IgA
9- The properties of human IgG are such that it can pass the placenta
10- A nonspecific exaggerated physiologic response which involves a vascular response and a cellular response by phagocytic cells to infection/injury is innate immunity
11- Lysozyme constantly baths the kidney and the surface of the eye (tears).
12- Cell movement in a certain direction under the stimulation of chemical substances is phagocytosis
13- Coating of Antibody and/or complement to facilitate phagocytosis is opsinization
14- Penicillin called hapten because its molecular weight is lower than 1000 dalton
15- Cooperative T cell with B-cell enhance the production of Ab
16-

III-Discuss the principle four of each the following: (25 marks)

a- Formation of monoclonal antibodies in vitro
b- Detection of anti-Rh IgG antibodies in the blood of an Rh negative
c- Detection of unknown antigen by using ELISA
d- Separation of free antigen from that bound to antibody in radio-immuno assay
e- Determination of molecular weight of specific antigen

IV- Illustrate with a diagram of the following (25 marks)

a. Immunoglobulin that penetrate the placenta
b. The thymus
c. MHC class II and Class I
d. Type Ab concentration in triggering of immune response for Toxoplasmosis in first and second infection
e. Alternative pathway of complement

V- Discuss the following: (20 marks)

a. Sensitization phase of anaphylactic reaction
b. Biological function of complement
c. Inflammation
d. Arthus reaction

أطيب التمنيات بالنجاح و التوفيق

Prof. Tarek M Mohamed

	Tanta UNIVERSITY FACULTY OF SCIENCE DEPARTMENT OF CHEMISTRY	
	EXAMINATION for Seniors (Fourth Year) students OF Biochemistry	
COURSE TITLE:	Immunology	COURSE CODE: BC 4107
DATE: 6-1 JANUARY, 2021	TERM: FIRST	TOTAL ASSESSMENT MARKS:100 / TIME ALLOWED: 2 HOURS

I-Choose the correct answer (15 Marks)

1-Antibody specificity of a particular B cell
a)is encoded in the genome of the B cell
b) may switch from one idiotype to another during differentiation
c)may switch from one protype to another during differentiation
d)is induced by interactions with antigen

2- A patient is admitted with multiple bacterial infections and is found to have a complete absence of C3. Which complement-medi¬ated function would remain intact in such a patient:
a) opsonization of bacteria b) generation of anaphylaioxins
c) generation of neuirophil chemotaclic factors d) none of the above

3-Thymus processing is not necessary for mat¬uration of
a) helper T cells b)B cells c)cytotoxic T cells d) monocytes

4-Active fragments of C5 can lead to
a)relaxation of smooth muscle b) vasodilation
c) attraction of leukocytes d) attachment of lymphocytes to macrophages

5) Macrophages
a)are derived from blood lymphocyte b) have a great diversity of form
c) are not able to ingest and degrade microorganisms
d) can process and present antigens to T cells

6) Immature B lymphocytes
a) produce only p-chains
b) are progenitors of T lymphocytes as well as B lymphocytes
c) express both IgM and IgD on their surface
d) are at a stage in development where contact with antigen may lead to unresponsiveness

7)Human T cells can be distinguished from B cells and other cells by
a) morphologic appearance b) the presence of Fc receptors
c) the formation of rosettes with sheep red cells
d) the presence of Ig surface markers

8) The class-specific antigenic determinants (epitopes) of immunoglobulins are associated with
a) L chains b) H chains c) J chains d) variable regions

9) Converting a toxin to a toxoid
a) makes the toxin more immunogenic
b) reduces the pharmacologic activity of the toxin
c) enhances binding with antitoxin d) induces only innate immunity

10) Haptens
a) require carrier molecules in order to be immunogenic
b) will not react with specific antibodies in vitro unless homologous carriers are employed
c) interact with specific antibody even if the hapten is multi
d) can stimulate secondary antibody responses without carriers

11) The protection against smallpox afforded by prior infection with cowpox represents
a) antigenic specificity b) antigenic cross-reactivity
c) viral super infection d) innate immunity

12) The immune cells that are responsible for detecting and destroying parasites are:
a) Natural killer cells b) Mast cells c) Eosinophils d) Neutrophils

13- CD3 is expressed on:
a) Both T-helper and Cytotoxic T-Lymphocytes b) Macrophages
c) All lymphocytes d) B- cells

Tanta University
Faculty of Science
Department of Chemistry

Final Exam. for 4th special chemistry students (Graduation Requirements)

Computational Chemistry Course Code: CH4214

Jan. 4, 2021 Term: first Total Assessment Marks: 50 Time Allowed: 2 Hours

Answer the following questions:

Sketch the correlation diagram from the attached data for OH_2 molecule. Show the different types of overlap ,electronic distribution for H_2O molecule

ATOM		X	Y	Z	S			P		
					N	EXP	COUL	N	EXP	COUL
O	1	.00000	.00000	.00000	2	2.2459	-28.4800	2	2.2266	-13.6200
H	2	1.0000	.00000	-1.0000	1	1.2000	-13.6000	0	.0000	.0000
H	3	-1.0000	.00000	-1.0000	1	1.2000	-13.6000	0	.0000	.0000

0DISTANCE MATRIX

	1	2	3
1	.0000	.9900	.9900
2	.9900	.0000	1.5656
3	.9900	1.5656	.0000

0SPIN= 0

ENERGY LEVELS (EV)

E(1) =	14.73419	0
E(2) =	3.38040	0
E(3) =	-13.62000	2
E(4) =	-14.43845	2
E(5) =	-16.97488	2
E(6) =	-31.03678	2

0 ENERGY= -150.09316161 EV.

0MO'S IN COLUMNS, AO'S IN ROWS

	1	2	3	4	5	6
1	-.9712	.0000	.0000	.2319	.0000	.7793
2	.0000	.9247	.0000	.0000	-.6834	.0000
3	.0000	.0000	1.0000	.0000	.0000	.0000
4	.5517	.0000	.0000	.9213	.0000	.3224
5	.8029	-.8588	.0000	-.1291	-.3815	.2029
6	.8029	.8588	.0000	-.1291	.3815	.2029

0REDUCED OVERLAP POPULATION MATRIX, ATOM BY ATOM

	1	2	3
1	5.9549	.6598	.6598
2	.6598	.4068	-.0882
3	.6598	-.0882	.4068

1- Calculate the eigen value of H_2O molecule.
2- Define the HOMO and LUMO levels and calculate the energy gap.
3- Calculate the distance between O and H.
4- Explain the stability of H_2O molecule.
5- Differentiate between non-bonding and antibonding orbitals
6- What type of overlap between O and H2 atoms.
7- Define the ionization potentials for 2p of O and 1s of H atoms.
8- Differentiate between orbital exponent of O and H atoms.
9- How many atomic orbitals are involved in the interaction.
10-Explain the importance of wave function matrix.

Good Luck Prof. Dr. Mohamed K. Awad

	TANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT OF CHEMISTRY			
	Examination for the fourth year students (Double Major)			
	COURSE TITLE:	Organic Reaction Mechanism		COURSE CODE: CH 4254
TE:	2020 4/1		TOTAL ASSESSMENT MARKS: 50	TIME ALLOWED: 2 HOURS

1- Answer by equations the following reactions: (20 Marks)

a- Effect of acid on Hydrazo benzene. Show the mechanism.

b- Addition of water on Carbonyl groups.

c- Write a methods for Alkylation of Benzene.

d- Benzyne mechanism. Show the mechanism.

2- Explain by mechanism the following reactions ; (15 Marks)

a- Substitution Nucleophilic in Aromatic compounds,

b- How u prepare DDT. Show the mechanism.

c- Effect of acid on 1,2-dihydroxy compounds.

3- Answer by mechanism the following reactions ; (15 Marks)

a- A mixture of formaldehyde and benzaldehyde in NaOH solution,

b- Favorski re-arrangement,

c- Diazo coupling. Discuss by examples.

Examiner

Prof.Dr. Mahmoud Fahmy

	TANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT OF CHEMISTRY			
	EXAMINATION FOR LEVEL FOURTH OF STUDENTS OF CHEMISTRY MAJOR			
	COURSE TITLE:	ANALYTICAL BIOCHEMISTRY		COURSE CODE: CH4228
DATE:	5-1-2021	TERM: FINAL	TOTAL ASSESSMENT MARKS: 50	TIME ALLOWED: 2HOURS

Answer all the following questions:

A- Write the role of the following (7 marks)

1. Cellulose acetate membrane strips
2. SDS in polyacrylamide gel electrophoresis
3. Microscopic examination
4. Western blot
5. PCR
6. Densitometer
7. Two-dimensional electrophoresis

B-Write short notes (33marks) (3 marks each)

1- How to perform sandwich ELISA for detection of antigen and the color reactions with simple equations. (ELISA stand for what?)?
2- How to perform southern blot?
3- Means for identification of systematic errors
4- Flow cytometry
5- How to liberate protein of interest from cytosol of mammalian cells?
6- Steps and amplification curve of PCR
7- Principle of radioimmunoassay
8- Zonal centrifugation
9- Dialysis
10- Rocket Immunoelectrophoresis
11- Immunoprecipitation of a protein of interest

C-Write the scientific term of the following (10 marks) (1 mark each)

1. The smallest concentration of the test analyte that can be distinguished from zero with a defined degree of confidence.
2. A measure of the ability of the method to give a consistent result in spite of small changes in experimental parameters such as pH.
3. A microscope that is routinely used for visualizing cells in culture.
4. A technique that is combines the specificity and spatial resolution of fluorescence microscopy with the selective binding of antibodies to their respective epitopes.
5. A single stranded piece of DNA labelled (either with radioisotope (^{32}P labelled) or with nonradioactive label, the nucleotide sequence of which is complementary to the target DNA.

See the next page

6. Increasing the solubility of a protein by addition of salt
7. Marker of mitochondria in fractional centrifugation
8. Measurement of the response of living cells either in vivo or in vitro to external factors.
9. Centrifuge that is designed for the benchtop, and used for rapid pelleting of small samples
10. Centrifugation in which the density gradient is formed during the centrifugation

All the best

Examiners

Prof. Tarek Mostafa **Associate Prof. Thoria Donia**

	TANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT OF CHEMISTRY			
	FINAL EXAMINATION for Special Chemistry&Material Science Groups			
	COURSE TITLE:	POLYMER CHEMISTRY		COURSE CODE: CH 4105
DATE:	13 JAN 2021	TERM: FIRST	TOTAL ASSESSMENT MARKS: 50 DEGREE	TIME ALLOWED: 2 HOURS

1) Write the **name** & **structure** of monomers for each of the following polymers: **(10 marks, 2 marks for each)**

a) Polycarbonate,
b) Poly(ethylene terephthalate),
c) Nylon 610,
d) Epoxy resin,
e) Hard & Elastic polyurethanes.

2) Write short notes on the following: **(10 marks, 5 marks for each)**

a) Emulsion polymerization,
b) Isomerization polymerization.

3) How can you prepare the following: **(10 marks, 5 marks for each)**

a) Requirements of stepwise polymerization,
b) Ion exchange resins.

4) How can you prepare the following: **(10 marks, 5 marks for each)**

a) Block copolymers,
b) Vulcanized rubber.

5) Choose the correct answers: **(10 marks, one mark for each)**

i) Polymer formed by the polymerization of hexamethylene diamine & adipic acid is:

a) Nylon-610,
b) Nylon-66,
c) Bakelite.

ii) Polymer obtained by the polymerization of two different types of monomers is:

a) Homopolymer,
b) Heteropolymer,
c) Copolymer.

iii) What are the monomers used for the formation of polyurethane?

a) Isobutylene & isoprene,

b) Diisocyanate & diol,
c) Phenol & formaldehyde.

iv) Which of the following is common anionic initiator?
a) Sodium metal,
b) Azobisisobutyronitrile,
c) Dibenzoyl peroxide.

v) Which of the following is the characteristic of thermoplastic?
a) Cross-linking between chains,
b) Can not be molded,
c) Can be melted.

vi) What is the type of the polymerization used for the formation of polystyrene?
a) Fast polymerization,
b) Addition polymerization,
c) Condensation polymerization.

vii) Which of the following is true regarding addition polymerization?
a) Monomers contain two functional groups,
b) The reaction mechanism involves initiation, propagation & termination,
c) Polyamides & polyesters are polymers of this type.

viii) Disproportionation of polymer propagating chains yields:
a) One polymer chain with long length,
b) Two polymer chains with short length,
c) Three polymer chains.

ix) What is the type of the polymerization of styrene with BuLi?
a) Ring-opening,
b) Condensation,
c) Living.

x) What is the characteristic of cross-linked polymers?
a) Solubility in organic solvent,
b) Melting on heating,
c) Insolubility in all solvent.

With best regards,

EXAMINER	DR. AHMED AKELAH	

Tanta University Final exam. For level 4 students all sections in

Faculty of Science petroleum Code [CH4145] Jan.2021

Chem.Departement Total assessment (50 marks) Time:2hrs

Answer the following questions:

1] Choose the correct answer: (30 marks)

a) Pour point is used to measure quality of crude oil by detection of:

i) Paraffinic and aromatic ii) Wax content iii) Sulfer contents

iv) Ash contents

b) API Gravuty:

i) Increase with icreasing specific gravity ii) Incease with decreasing specific gravity iii) Decrease with decreaseing specific gravity

iv) not affected

c) As linear hydrocarbons increase :

i) Octane number increase ii) Octane number decrease

iii) Cetane number icrease iv) Cetane number decrease

d) Perochemicals are used in the manufacture of :

i) Resins ii) Fibers iii) Detergents iv) All of them

e) Olefins are not present in crude oil because they are:

i) Less reactive . ii) Very unstable . iii) Easily polymerize.

iv) Useless compounds.

f) Teflon is produce from petroleum using:

i) Ethane ii) Chloroform iii) Formaldehyde iv) Carbon tetrachloride

g) Hexamine is produced from petroleum using:

i) Formadehyde only ii) Formaldehyde and ammonia

iii) Ammonia only iv)Propane

أنظر خلف ←

h) Polyesters are produce using :

i) Phthalic acide

ii) Phthalic acid and ethylene glycol

iii) iso- Propene

iv) iso-Phthalic acid

i)The kerosine zone is characterized by:

i) Flash point ii) Octane number iii) VI Index iv) Cetane number

j) The starting material to prepare caprolactam from petroleum is :

i) Cyclohexanone ii) Hydroqunone iii) Anilne iv) phthalic acide

2] Write short note on the following: (10 marks)

a) Catalytic cracking

b) Phenolic resins

c) Classification of crude oil according to CI index.

d) Linear alcohols.

e) Aniline point.

3] From petroleum how can you prepare the following (10 marks)

a) Black carbon.

b) Ammonia nitrate fertilizer.

c) Ethanol amine

d) Nylon 6,6.

e) Ethylene glycol.

GOOD LUCK **Prof. Dr.ABDEL-BASET SHOKR**

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GOOD LUCK **Prof. Dr.ABDEL-BASET SHOKR**

	TANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT OF CHEMISTRY			
	FINAL EXAMINATION for Special Chemistry&Material Science Groups			
	COURSE TITLE:	POLYMER CHEMISTRY		COURSE CODE: CH 4105
DATE:	13 JAN 2021	TERM: FIRST	TOTAL ASSESSMENT MARKS: 50 DEGREE	TIME ALLOWED: 2 HOURS

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With best regards,

EXAMINER	DR. AHMED AKELAH	

	TANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT OF CHEMISTRY			
	BIOCHEMISTRY EXAMINATION FOR LEVEL 4 STUDENTS OF SPECIAL CHEMISTRY SECCTION			
	COURSE TITLE:	NUCLEIC ACIDS METABOLISM		COURSE CODE: CH4230
DATE:	DEC.. 2020	TERM:REQUISITE COURSE	TOTAL ASSESSMENT MARKS: 50	TIME ALLOWED: 2 HOURS

Answer the following questions:

Q1)- ***(12 marks)***

a- Explain how ***Uric acid is*** formed from ***IMP.*** ***(4 marks)***

b- Explain ***Watson*** and ***Crick*** three-dimensional structure of ***DNA.*** ***(4 marks)***

c- Write the thioredoxin cycle for ***d-AMP*** synthesis including the corresponding enzymes. ***(4 marks)***

Q2)- ***(14 marks)***

a- What are the sources of ***C-2, C-6 and N-1*** in de-novo synthesis of purine ribonucleotides? Write ***only*** the corresponding reaction equations. ***(6 marks)***

b- Write the catabolic pathway of ***Thymine.*** ***(4 marks)***

c- Explain the importance of ***Cyclic Nucleotides.*** ***(4 marks)***

Q3)- ***(10 marks)***

a- Explain ***only*** the processes and write the enzymes involved in replication of ***DNA.*** ***(6 marks)***

b- Write the conversion of ***Hypoxanthine*** into ***AMP.*** ***(4 marks)***

Q4)- ***(14 marks)***

a- The turnover of ***Nucleic acids*** (RNA and DNA) results in the release of ***Pyrimidine*** bases. ***(6 marks)***

b- Write the source of ***C-8, N-7*** in de-novo synthesis of purine ribonucleotides? Write ***only*** the corresponding reaction equations. ***(4 marks)***

c- Write the ***Cytoplasmic*** biosynthesis of ***OMP.*** ***(4 marks)***

GOOD LUCK

Dr. Yehia Hafez

	Tanta University, Faculty of Science, Chemistry Department		
	Examination for Fourth Level (Credit Hours) Students		
	Course Title	Chemistry of Pesticides	Course Code: CH4119
Date:	8-3- 2021	Total Assessment Marks: 50	Time Allowed: 2 hrs

I) Carryout the following conversions (15 Marks):

1) Chlorobenzene to DDA
2) Secondary amine to Ferric dialkyl dithiocarbamate
3) Diethyl chloro phosphate to phosphorus acid
4) Trichloro acetaldehyde to dicofol
5) DDT to Bis(*p*-chlorophenyl)methyl carbinol

II) Write one method to prepare the following pesticides (10 Marks):

1) Nicotine
2) Bordeaux mixture
3) Prolan
4) Endrin
5) 2-Methyl sulphoxide-2-methyl propanal

III) Complete the following chemical equations and name all products (10 Marks):

1) Trichloro acetaldehyde + anisole + c. H_2SO_4 → **A** —aq. base→ **B**
2) Diethyl chloro thiophosphate + sodium *p*-nitro phenolate → **C** —Conc. HNO_3→ **D**
3) Cyclopentadiene + HCCP → **E** —SO_2Cl_2/Benzoyl peroxide→ **F**
4) DDT —Zn dust, EtOH→ **G** — alc. KOH → **H**
5) Cyclohexene —$5Cl_2$→ **I** —200°C → **J**

IV) Discuss each of the followings (15 Marks):

1) Theories explain structure activity relationship of DDT.
2) Classification of insecticides according to their penetrations.
3) Metabolism of carbaryl.

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Prof. Dr. Mohamed Azaam ***Dr. Atif El-Gharably***

	Tanta University, Faculty of Science, Chemistry Department		
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Prof. Dr. Mohamed Azaam ***Dr. Atif El-Gharably***

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Prof. Dr. Mohamed Azaam ***Dr. Atif El-Gharably***

	TANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT OF CHEMISTRY		
	Final Examination for "Chemistry Section" Students		
	TERM: Second Term	Course Title: Physical Polymers	Course Code: CH4212
DATE:3-3-2021	TOTAL ASSESSMENT MARKS: 100		TIME ALLOWED: 2 h

Answer the following Questions:-

1-Define [8 Marks]

a) Number average molecular weight of polymers
b) Melting temperature of polymers

2-Differentiate between each pair of the following

a-Macroporous and macroreticular resins (Method of preparation and properties) **[10 Marks]**
b-Fiber and elastomer (with drawing the stress strain curve) for them. **[10 Marks]**
c-Glassy state and viscofluid state of polymers **[10 Marks]**

3- Explain

a- Viscometry method for determination viscosity average molecular weight of new polymer **[10 Marks]**
b- A method for swellability determination of crosslinked polymer **[5 Marks]**

C- The effect of polarity and backbone on chain flexibility **[10 Marks]**

4- Write the structure of each pair of the following then compare between them giving the reason [21 marks]

a- Polyvinylchloride and polyvinyldichloride in chain flexibility
b- Polyacrylic acid and polymethylmethacrylate in glass transition temperature
c- Nylon 66 and Nylon 77 in melting temperature
d- P-polyphenylene and polyethylene in rigidity
e- Polyethyleneglycolterephthalate and polyethylene glycoladepate in chain flexibility
f- Syndiotactic polybutadiene and atactic polybutadiene in crystallinity
g- Poly α- methylstyrene and polyethylene in glass transition temperature

5- Write the Scientific term [8 Marks]

1- If the polymer is deformed and held at constant value of strain, then the applied stress required to maintain that given amount of strain decreases with time.
2- Polymers that cannot form true solution, high thermal stability and low chain flexibility
3- The state of polymer at which the vibrational motion of the atoms constituting the chain are restricted.
4- The deformation continuous to increase with time under a constant applied load.
5- Materials that are added to polymers in order to reduce the cost and improve modulus.
6- The initial slope of stress-strain curve provides a value is a measure of stiffness.
7- The stress at the breaking point, which is the force required to fracture the material completely.
8- It refers to the activation energy required to initiate vibrational and rotational motion that leads to different conformation.

6- Put right (√) or wrong (X) [8 Marks]

1- The extent of swelling, pore size and total surface area of the polymer depend on the degree of crosslinking.
2- The free rotation of the atoms relative to one another in polymers depends on the chemical structure of the polymer and on the nature of the functional groups.

3- The height of energy barrier for rotation depends on inter and intramolecular interaction.
4- Cyclic structures in the backbone of the chain favor conformational change.
5- Heating polyacrylonitrile at elevated temperature leads to rigid structure.
6- The area under the stress strain curve is an indication of the strength of the polymeric material.
7- The polymers that can form intermolecular hydrogen bonds greatly decrease crystallite stability.
8- The influence of temperature on the stress-strain behavior of polymers is in general opposite to the effects of strain rate.

7- Choose the correct answer [10 Marks]

1- The degree of crystallinity depends on
a) The structure of the polymer chains b) The amount of chain flexibility
c) Degree of crosslinking d) a, b are correct e) b,c are correct

2- Resist deformation and exhibit low elongations under small applied stresses.
a) Elastomers b) Flexible plastics c) Fibers d) rubber

3- The coil density is influenced by
a) Temperature and extent of solvation
b) Ionic groups and their degrees of dissociation.
c) Molecular weight d) a, b, c are correct e) a, b are correct

4- With increasing strain rate most polymers show ----- in modulus, -------in yield stress, and ------ in elongation to fracture.
a) Increase – increase - decrease b) Increase - increase – increase
c) Decrease - decrease – decrease d) Decrease – increase - decrease

5-With increasing the sulfur content in vulcanized rubber, the chain flexibility -------, rigidity----
a) Increase-decrease b) increase-increase c)decrease-decrease d)decrease -increase

6- With increasing temperature, the modulus --------, the yield stress is --------and the polymer becomes --- ductile.
a) Increase – increase – more b) Increase – increase – less
c) Decrease – decrease – more d) Decrease – increase – more

7- At very large doses of radiation of crystalline polymers, the modulus value begins to------- with increasing radiation dose. This is an indication that the density of cross-linking has ------sufficiently to overcome the effects of ---------crystallinity.
a) Increase – increase - decrease b) Increase - increase - increase
c) Decrease – decrease - decrease d) Decrease – increase - decrease

8- In saturated hydrocarbon (homochain) polymers, the height of energy barrier for rotation ------ and therefore their chains possess------ rigidity.
a) Low – high b) Low – low c) High – low d) High – high

9- The potential energy barriers of polymers containing amide bonds are ------and hence their chains have --------rigidity.
a) Low – high b) Low – low c) High – low d) High – high

10- The rigidity of a polymer ------- with increasing number of crosslinks
a) Increase b) Decrease c) Not affected

Examiners: Prof. Dr. Nehal Salahuddin , Prof. Dr. Ahmed Rehab

	Tanta UNIVERSITY FACULTY OF SCIENCE DEPARTMENT OF CHEMISTRY			
	EXAMINATION for (seniors) students OF SPECIAL BOTANY, MICROBIOLOGY, ZOOLOGY SECTIONS			
	COURSE TITLE:	biochemistry 1		COURSE CODE: 4173
DATE: 20-1-2021	IAN. , 2021	FIRST TERM EXAM	TOTAL ASSESSMENT MARKS: 100	TIME ALLOWED: 2 HOURS

Answer the following questions:

I-Explain each of the following: (40 marks)

i-Classification of Oxidoreductases.

Ii- Glucosyltransferases are a type of glycosyltransferase that enable the transfer of glucose

iii-Some enzymes are relatively specific.

iv-The biofunction of FAD.

v-The mechanism of transamination, showing the transfer of the α-amino of an amino acid to pyridoxal phosphate PLP.

II- Give an account of the following by biochemical equations (40 marks)

i-The biosynthesis of thiamine starts wth hydroxymethylpyrimidine kinase reaction.

ii- Isomerases catalyze isomerization reactions of several types.

iii- NAD + biosynthesis from simple component e.g. quinolinic acid.

iv-Decarboxylation reactions of the amino acids, lysine , glutamate , histidine and L-Dopa.

v- The biofunction of Biotine .

III- Choose the correct answer . EXPLAIN (16 marks)

i-The role of TPP in transketolase reaction forms

a-Glyceraldehydes 3-phosphate b- DHAP c- sedoheptulose 7-phosphate

ii- FMN and FAD synthesis requires

a-Riboflavin b- ATP c- riboflavin kinase

iii-The biosynthesis of pantothenic acid requires

a-Ketoisovaleric acid b- HCHO c- β-alanine

iv-The first step in the glycolytic pathway producesn

a- ATP b-ADP c- glucose -6 –phosphate

IV- TRUE-FALSE QUIZ (4 marks)

i-Conversion of lactic acid to pyruvic acid occurs to yield the oxidized coenzyme NAD^+.

ii-Malate dehydrogenase is an enzyme that irreversibly catalyzes the reduction to oxaloacetate.

PROF.DR. AHMED SAAFAN

	Tanta University Faculty of Science Chemistry Department		
	Examination for fourth Year Students		
	Course Title: Chemistry of Textile fibers		Course Code:CH4121
	Date: 13-3-2021	Total Assessment Marks: 50	Time Allowed: 2 hrs

1) Differentiate between each of the followings: (15 Mark)

1. Classification of textile fibers according to the origin and chemical structure
2. Cross-Linking of wool and cotton
3. Flame Retardant Rayons and Cellulose Acetate fibres
4. Effect of acid and action of heat on cellulose and acrylic fibres
5. Effect of acids and alkalis on polyamides and polyesters

2) Mark (√) or (×) and correct the wrong statement: (10 Marks)

1. The first acrylic fibre was marketed under the trade name 'Acrilan' ( )
2. Carbonizing of wool is used to remove wool grease ( )
3. *m*-aramid fibres confers even greater structural rigidity than *p*-aramid ( )
4. Silk fibers have excellent resiliency ( )
5. Cuprammonium rayon filaments are finer than those of viscose ( )
6. The triacetate fiber is less hydrophilic than the acetate ( )
7. Nylon 6 is synthesized by ring opening polymerization of caprolactam ( )
8. The most important benefit of mercerization is the decrease in dye ability ( )
9. Hydrolysis of silk is greater in acidic conditions than in alkaline conditions ( )
10. The most important polyester in commercial terms is PBT ( )

3) Choose the correct answer: (10 Marks)

1. Wool can be dyed by .....

   a) Direct dye b) disperse dye c) reactive dye d) none of these

2. .....is used to remove excess vegetable matter from the wool

   a) Carbonizing b) emulsification c) scouring d) Bleaching

تابع الأسئلة فى الصفحة القادمة

3. The textile industry made considerable technological advances from the 1930s with the development of .....

a) Regenerated fiber b) protein fiber c) synthetic polymers d) cellulosic fiber

4. The trade name of *m*-aramid is .....

a) Acrilan b) nomex c) kevlar d) Vectras

5. ..... fibres were the earliest synthetic fibres to become major commercial products

a) Polyester b) Acrylic c) Aramid d) Polyamide

6. The ..... are those with fibre lengths of between 25–65 mm

a) highest quality fibres b) shorter fibre c) standard cottons d) none of these

7. The Federal Trade Commission defined acrylic fibres as those containing at least ..... by weight of acrylonitrile comonomer

a) 45% b) 65% c) 35% d) 85%

8. Mercerization of cotton is carried out in solutions of ..... caustic soda

a) 25–30% b) 7-10% c) 15-20% d) 40–45%

9. *m*-aramid fibres possess good .....

a) mechanical properties b) thermal stability

c) thermal and mechanical properties d) none of these

10. As a result of the loss of sericin during degumming, silk loses up to ..... of its weight

a) 50% b) 15% c) 25% d) 70%

4) Explain the following: (15 Mark)

1. The copolymerization with other vinyl monomers is an important tool to overcome the undesirable properties of acrylic fibers
2. Requirement of fiber forming polymers
3. Different crystalline structures of cellulose
4. Chemical Processing of Cotton
5. Production of PET, Nylon 6, 6 and *p*-Aramid fibres

EXAMINERS: Prof. Seham Abdel lattif Prof. Mohamed Azaam

	TANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT OF CHEMISTRY			
	FINAL EXAMINATION for Complementary Program (all Branches)			
DATE:	COURSE TITLE:	POLYMER CHEMISTRY		COURSE CODE: CH 4244
	16 MARCH 2021	TERM: FIRST	TOTAL ASSESSMENT MARKS: 50 DEGREE	TIME ALLOWED: 2 HOURS

1) Write are the types of the monomers used for preparation of the following polymers, give an example: **(10 marks, 2 marks for each)**
   a) Polyester,
   b) Polyamide,
   c) Phenol-formaldehyde resin,
   d) Polycarbonate,
   e) Amino- resin.

2) Write short notes on the following: **(10 marks, 5 marks for each)**
   a) Characteristics of condensation polymerization,
   b) Suspension polymerization,

3) Write short notes on the following: **(10 marks, 5 marks for each)**
   a) Characteristics of addition polymerization,
   b) Emulsion polymerization.

4) Write short notes on the following: **(10 marks, 5 marks for each)**
   a) The stages of addition polymerization,
   b) Types of free radical initiation.

5) Choose the correct answers: **(10 marks, one mark for each)**

i) Polymer formed by the polymerization of diamine & diacid is:
   a) Polyesters,
   b) Polyamides,
   c) Polycarbonates.

ii) Polymer obtained by the polymerization of two different types of monomers is:
   a) Homopolymer,
   b) Heteropolymer,
   c) Copolymer.

iii) Which of the following is common free radical initiator?
   a) Sodium metal,

b) Azobisisobutyronitrile,
c) Aluminum chloride.

iv) What are the monomers used for the formation of condensation polymer?
a) Isobutylene & isoprene,
b) Butadiene rubber,
c) Phenol & formaldehyde.

v) What is the type of the polymerization used for the formation of polystyrene?
a) Fast polymerization,
b) Addition polymerization,
c) Condensation polymerization.

vi) Which of the following is the characteristic of thermoplastic?
a) Cross-linking between chains,
b) Can not be molded,
c) Can be melted.

vii) Disproportionation of polymer propagating chains yields:
a) One polymer chain with long length,
b) Two polymer chains with short length,
c) Three polymer chains.

viii) Which of the following is true regarding addition polymerization?
a) Monomers contain two functional groups,
b) The reaction mechanism involves initiation, propagation & termination,
c) Polyamides & polyesters are polymers of this type.

ix) What is the characteristic of cross-linked polymers?
a) Solubility in organic solvent,
b) Melting on heating,
c) Insolubility in all solvent.

x) Linear polymers are classified based on their thermal properties to:
a) Thermoplastic,
b) Thermosetting,
c) Cross-linked.

With best regards,

EXAMINER	DR. EL REFAY KENAWY	DR. AHMED AKELAH

	Tanta UNIVERSITY FACULTY OF SCIENCE DEPARTMENT OF CHEMISTRY			
	EXAMINATION for senior (fourth Year) students OF BIOCHEMISTRY			
	COURSE TITLE:	Ezymology [2]		COURSE CODE4113
DATE: 23-1	JANUARY 2021	TERM: FIRST	TOTAL ASSESSMENT MARKS: 50	TIME ALLOWED: 2 HOURS

I- Choose the correct answer **(15 Marks)**

1- . What enzymes catalyze the reactions of protein-enzyme phosphorylation?

a) protein hydrolases b). protein synthetases
c) protein phosphatases d). protein kinases

2- Which of the following is true of the binding energy derived from enzyme substrate interactions?

a) Most of it is used up simply binding the substrate to the enzyme.
b) Most of it is derived from covalent bonds between enzyme and substrate.
c) It is sometimes used to hold two substrates in the optimal orientation for reaction.
d) All the above

3- 1 The receptor site for inhibitor molecules that bind at a location other than the active site is called _____.

a) the passive site b) the regulatory site c) the allosteric site
d) All of the above (depending upon the enzyme involved).

4- Why is histidine unlikely to act as a general base in the catalytic mechanism of enzymes localized to the lysosome, an organelle where the pH is close to 4.5?

a) His has a positive charge at pH 4.5 b) His side chain has a pKa close to 6
c) His would be in its acid form, not basic form at pH 4.5
d. all of the above (a, b, and c)

5- Extrinsic system of blood clotting is initiated by

a) Factor-V. b) Factor-VIII c) Factor-II d) Factor-I

6- Homeostasis means

a) Control of internal environment of the body
b) Adaptation with the environment c). Constant environment of the body
d) All of the above

7- Allosteric enzymes _____.

a) usually have quaternary structure.
b) do not behave according to Michaelis-Menton kinetics.
c) bind allosteric modulators at sites not associated with substrate binding..
d) all of the above.

8- Allosteric inhibition is also known as

a) Competitive inhibition b) Non-competitive inhibition
c) Feedback inhibition d)) Mixed inhibition .

9- Multiple forms of the same enzymes are known as

a) Zymogens b) Isoenzymes c) Proenzymes d) Pre-enzyme

10- An allosteric enzyme is generally inhibited by

a) Initial substrate of the pathway b) Substrate analogues
c) Product of the reaction catalysed by allosteric enzyme
d) Product of the pathway

11- Regulation of some enzymes by covalent modification involves addition or removal of

a) Acetate b) Sulphate c) Phosphate d) Coenzyme

12- Covalent modification of an enzyme generally requires a

a) Hormone b) cAMP c) Protein kinase d) **All of these**

13- Covalent modification of an enzyme usually involves phosphorylation dephosphorylation of

a) Serine residu b) Proline residue c) Hydroxylysine residue

d) Hydroxyproline residue

14- An allosteric enzyme influences the enzyme activity by

a) Competiting for the catalytic site with the Substrate

b) Changing the specificity of the enzyme for the substrate

c) Changing the conformation of the enzyme by binding to a site other than catalytic site

d) Changing the nature of the products formed

15. Which mechanism of proenzyme conversion into the active enzyme?

a) Denaturation of enzyme molecule b) Partial proteolysis of enzyme molecule

c) Changes of enzyme quantity d) All the above

1I-A- Describe the overall reaction mechanism and action of ribonuclease. (The active site of the enzyme include histidine 12, 19; lysine 7, 41, valine 43; theronine 45; and aspartate 121).

B- How acetylcholeine esterase has substrate specificity to acetylcholeine.

(15 marks)

III- A- Define the following: (20 Marks)

General acid and general base -Specific activity – Fold of purification- Oreintation- Immobilzation

b- How to identify serine 195 in the active site of chymotrypsin.

c-Glycogen phosphorylase is a model for covalently modulated enzyme. Illustrate this statement

d-Give an account of each of the following:

i)Four methods of immobilization and Advantages and disadvantages of enzyme immobilization

ii)Rate of acceleration and apparent Km attributed to K and M allosteric enzymes.

iii) Strain and distortion theory

iv) Using of Biosensors in medical diagnosis with an example

GOOD LUCK

Prof. Tarek M Mohamed

TANTA UNIVERSITY
FACULTY OF SCIENCE
DEPARTMENT OF CHEMISTRY

FINAL EXAM FOR SENIOR STUDENTS (DOUBLE MAJORS) 4th LEVEL

COURSE TITLE:	INDUSTRIAL CHEMISTRY	COURSE CODE:CH4155
DATE: MARCH 15, 2021	TERM: FIEST / TOTAL ASSESSMENT MARKS: 50	TIME ALLOWED: 2 HOURS

Answer in the following questions:

Section I: **25 Marks**

A. Identify the letter of the choice that best completes the statement or answers the question.

1. The head of the matches is made from .....
   a) red P b) sulfur c) white P d) sodium chlorate
2. From the industrial point of view, centrifuging is considered as .....
   a) chemical process b) unit operation c) chemical reaction d) unit process
3. ..... is used as a starting material in Ostwald process.
   a) Ammonia b) Sulfuric acid c) Nitric acid d) Hydrazine
4. The production of hydrogen peroxide depends on the use of ..... as a carrier
   a) anthrahydroquinone b) hydrogen c) palladium d) anthraquinone
5. Carbon is a raw material from .....
   a) biosphere b) atmosphere c) lithosphere d) geosphere
6. Ethylene is considered among the top .....
   a) BIC b) Specialty chemicals c) Fine chemicals d) BOC
7. Water-gas shift reaction is the reaction between water and .....
   a) methane b) caron monoxide c) carbon dioxide d) carbon
8. .....is used for converting liquid oils into semisolid materials.
   a) Hydrogen gas b) Nitric acid c) Hydrazine d) Hydrogen peroxide
9. Rasching process is based on the oxidation of .....
   a) hydrazine b) urea c) NaOCl d) ammonia
10. Ostwald process is used for the production of .....
    a) hydrazine b) ammonia c) nitric acid d) sulfuric acid
11. ..... is weak acid used for the production of bleaches.
    a) Hydrazine b) Ammonia c) Hypochlorous acid d) Nitric acid
12. ..... are high value-added products that are sold based on specific function.
    a) Commodity chemicals b) Specialty chemicals c) Fine chemicals d) Accurate chemicals
13. Superheated water is injected through ..... during the extraction of sulfur
    a) central pipe b) outer pipe c) concentric pipes d) middle pipe
14. The disadvantage of urea process is using excess .....
    a) hydrazine b) ammonia c) urea d) sodium hydroxide
15. ..... can't occur naturally but formed from phosphate rock.
    a) White P b) Red P c) All P types d) Violet P
16. Consider the reactions

    A. $H_2O_2 + 2HI \Longrightarrow I_2 + H_2O$ B. $H_2O_2 + HOCl \Longrightarrow H_3O^+ + Cl^- + O_2$

Which of the following statements is correct about H with reference to these reactions? Hydrogen peroxide is

a) a reducing agent in (A) and oxidizing agent in (B)
b) an oxidizing agent in both (A) and (B)
c) an oxidizing agent in (A) and reducing agent in (B)
d) a reducing agent in both (A) and (B)

17. Which of the following structural features explains why diamond does not conduct electricity?
    a) In diamond, there is a large surface-area-to-volume ratio.
    b) In diamond, carbon atoms form layers that can slide over each other.
    c) In diamond, only the core electrons are free to move.
    d) In diamond, there are no ions or free electrons to carry the charge.

18. One of the metal ores that are the source of sulfur...
    a) Copper pyrites ($CuFeS_2$) c) Bauxite ($Al_2O_{32}H_2O$)
    b) Chile saltpeter ($NaNO_3$) d) Cryolite (Na_3AlF_6)

19. A weakly acidic, colorless liquid, miscible with water in all proportions
    a) Hydrogen peroxide b) Hydrogen gas c) Anthraquinone d) White sulfur

20. Which feature of graphite is responsible for its electrical conductivity?
    a) Strong covalent bonds c) A high sublimating temperature
    b) Delocalized electrons d) Weak inter layer interactions

B. Answer the following:

1. Show only by equations, the oxidation steps for the manufacture of hydrogen peroxide.

2. Give reasons for the followings:

    a) Filtration during the synthesis of hydrazine.
    b) Injection of compressed air during sulfur extraction.

3. Write the uses of nitric acid and hydrogen gas.

Section II: (25 Marks)

1) Outline the chemical process's purpose by-products carried out on petroleum crude oil (Refinery processes)?

2) Draw structure of the following compounds;
    i- LNG and Syn.Gas ii- Liquid soap detergent
    iii- Stearic acid iv- Olive oil v- Aspirin

3) Draw the schematic diagram of petrochemicals (with structure and name) which derived **from one of the following:**
    i-Benzene *ii-Methane*

4) Discuss the industrial manufacture and utilization of ethanol?

5) Explain short notes about oxygen and nitrogen compounds in crude oil composition?

6) Discuss by equations the quality control parameters and physical measurements (saponification & iodine values) which determine the properties of fats and oils?

7) **Choose the correct answer;**
    a- One of the following is a Headache drug
    i- Aspirin ii- Penicillin iii- Sulpha drug iv- Alkyl barbiturate
    b- LPG (NLG) is a mixture of
    i- Methane / ammonia ii- CO_2 / Propane iii- Propane / butane iv- Ammonia / CO_2
    c- All of the following are saturated fatty acid except
    i- Palmitic acid ii- Myrestic acid iii- Oleic acid iv- Lauric acid

BEST WISHES

EXAMINERS Dr. Yusuf S. Al-Najjar

Dr. Mohamed Sadek

Tanta University – Faculty of Science – Department of Chemistry
Final Examination for Irregular Complementary Program
(Zoology, Botany and Entomology Sections)

Course Title:	ORGANIC REACTION MECHANISM		Course Code: CH4254
Jan. 2021	Term: First	Total Marks: 50 Marks	Time allowed: 2 Hours

Model Number (1)

Choose the correct answer in each of the following: **(1.5 marks for each)**

1- What is a nucleophilic substitution reaction?
a) A reaction that uses an electron-rich atom to kick off a leaving group.
b) A reaction that uses an electron-deficient atom to kick off a leaving group.
c) A reaction that occurs in order to keep aromaticity.
d) A reaction where a base removes a proton.

2- Which step in S_N1 reaction is a slow rate-determining step?
a) Attack of nucleophile.
b) Formation of a racemic mixture.
c) Formation of a transition state (intermediate).
d) All of the mentioned.

3- A low concentration of nucleophile favors the ...
a) S_N2 reaction. b) S_N1 reaction.
c) Both S_N1 and S_N2 reactions. d) None of the mentioned.

4- Carbonyl compounds react with HCN to form a cyanohydrin. It is an example of?
a) Electrophilic addition b) Electrophilic substitution
c) Nucleophilic addition d) Nucleophilic substitution

5- The more reactive substrate in S_N2 reactions is?
a) Allyl b) Benzyl c) Ethyl d) Isopropyl

6- Which of the following cannot react as a nucleophile?
a) $(CH_3)_4N$ b) $(CH_3)_3N$ c) CH_3NH_2 d) $(CH_3)_2NH$

7- Which of the following statements is wrong?
a) It is not necessary for a nucleophile to have an unshared electron pair.
b) A species can react as an electrophile if it contains an atom (other than hydrogen) with an incomplete valence octet (un octet).
c) A species can react as an electrophile, even if it has one or more unshared electron pairs.
d) Any species bearing a lone pair can normally react as a nucleophile.

8- Which of the following can react readily either as a nucleophile or as an electrophile?
a) $CH_2=CH_2$ b) CH_3COOH c) $(CH_3)_3B$ d) $(CH_3)_2O$

9- Which of the following cannot react as a nucleophile?

a) Reducing Agents
b) BH_3
c) CH_3NH_2
d) CH_3CH_2SH

10- All the following reagents are electrophiles, except ...

a) BF_3
b) SO_3
c) CH_2S
d) $BeCl_2$

11- Which of the following can react as a nucleophile?

a) $(CH_3)_3B$
b) $(CH_3)_3N$
c) $(CH_3)_3CH$
d) $(CH_3)_3O^+$

12- Select the correct statement from the following:

a) S_N2 reaction follows 2nd order kinetic.
b) No intermediate is involved in S_N2 mechanism.
c) S_N2 reactions are one-step reaction.
d) All of the mentioned.

13- Which of the following process occurs in the sulphonation of naphthalene as an isotopic labeling?

a) Migration
b) Desulphonation – resulphonation
c) Transformation
d) Both (a) and (b)

14- The more stable carbanion of the following is?

a) 3° Carbanion
b) 2° Carbanion
c) $\bar{C}H_3$
d) 1° Carbanion

Answer the following questions: **(29 Marks)**

1- Discuss in detail the presence of an intermediate and evidences on stereochemical studies. (explain your answer with examples). **(9 Marks)**

2- Illustrate in detail by mechanistic equations the following: **(5 Marks for each)**

a- Aromatic nucleophilic substitution ($\mathbf{S_N^{Ar}}$) of both activated and inactivated aryl halides.

b- An addition – elimination (condensation) reaction.

c- An electrophilic addition reaction (Markovnikov and anti-Markovnikov).

d- The $\mathbf{S_N^I}$ mechanism.

All Success

Examiner: Dr. Saeed Ali

	TANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT OF CHEMISTRY		
	EXAMINATION FOR FRESHMEN STUDENTS (IRREGULAR COMPLEMENTARY PROGRAM (MICROBIOLOGY AND GEOLOGY SECTION)		
	COURSE TITLE:	REACTION MECHANISM	COURSECODE: 4254
DATE:	21/3/2021	TERM: FIRST TOTALASSESSMENT MARKS: 100	TIME ALLOWED: 2 HOURS

Answer the following questions:

I)-Choose correct answer in each of the following: **[40 Marks]**

1- Inversion of configuration is associated with which of the following? [5 Marks]

A) E2 reaction B) free-radical halogenation C) S_N1 reaction D) S_N2 reaction.

2- Which of the following statements correctly describe(s) E2 reactions of alkyl halide (RX)? [5 Marks]

A) Rate = k [base] B) Rate = k [base][RX]

C) The reactions occur in two steps. D) Rate = k [RX].

3- Which of the following alkyl halides would you expect to undergo S_N2 reaction most rapidly? [5 Marks]

A) CH_3CH_2-Br B) CH_3CH_2- Cl C) CH_3CH_2-I D) CH_3CH_2-F

4- Circle the more likely mechanism for the reaction: [5 Marks]

2,4-Dinitrochlorobenzene + NaOH → 2,4-Dinitrophenol.

A) Aromatic electrophilic substitution. B) Aliphatic Nucleophilic substitution.

C) Benzyne intermediate mechanism.

D) Nucleophilic aromatic bimolecular displacement mechanism.

5- Which medium is used in benzylic acid rearrangement reaction?

A- Neutral B- Strong basic C- Mild acidic D- Strong acidic

6- Ketones are comparatively less reactive than aldehydes. It is due to:

A-Alkyl groups are electron donating B- Steric hindrance

C-Both (A) and (B) D- None

7- Bromination of an alkene is an example of :

A-Cis addition B-Trans addition C-Nucleophilic addition D- Syn addition

8- Which of the following compounds will condens with carbonyl compound in alkaline medium?

A- Hydrazine B- Phenyl hydrazine C-Hydroxyl amine D- Semi-Carbazide

باقى الأسئله فى خلف الورقه صفحة 2

9- Which intermediate carbocation is more stable in pinacol-pinacolone rearrangement?

A-1^0 Carbocation B- 2^0 Carbocation C- 3^0 Carbocation D- 4^0 Carbocation

10- Carbonyl compound react with HCN to form a cyanohydrain. It is an example of:

A- Electrophilic addition B- Electrophilic substitution
C-Neucleophilic addition D- Neucleophilic substitution

11- What is main difference between Hofmann and Curtius rearrangement?

A-Products are different B- Intermediate formed are different
C-Reactants are different D- Isomers

12- HBr can be added to an alkene in the presence of peroxides (H_2O_2).
What function does the peroxide serve in this reaction?

A) nucleophile B) electrophile C) radical chain initiator D) acid catalyst

***II)*-Mark (√) for the correct and (X) for the wrong statements. Please correct the wrong statements . [15 Marks].**

A) Retention of configuration is associated with S_N1 reactions.
B) ^-OH is a good leaving group in S_N2 reactions.
C) The E1cB mechanism would most likely be found with substrates containing basic hydrogens and good leaving groups.

***III)*-Discuss the primary kinetic isotope effect (give examples). [10 Marks]**

***IV)*- Reaction of 2-Methyl-2-chloropropane with alcoholic potassium hydroxide to 2- methyl-propene occurs through what mechanism?**

A) S_N1 B) E1 C) E2 D) S_N2 **[5 Marks].**

***V)*-Describe the mechanism of the following reactions: [30 Marks]**

1- Hydroxylation of olefinic double bond by peroxyacid.

2- Reaction of ethyl acetate with ethyl formate in the presence of sodium ethoxide.

3- Addition of HCl to 3,3-dimethyl-1-butene.

4- Electrophilic addition reaction to conjugated double bonds.

5- Effect of NaOH on a mixture of benzaldehyde and formaldehyde.

6- Schmidt rearrangement

Good Luck

EXAMINERS : Dr. MAHMOUD TAHA Dr. MAHMOUD El-BADAWI

	TANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT CHEMISTRY			
	EXAMINATION for 4th YEAR students of Botany and Microbiology			
1969	COURSE TITLE:	Biopolymer Chemistry البوليمرات الحيوية		COURSE CODE: CH4179
DATE:	2021' MARCH 20	TERM: FIRST	TOTAL ASSESSMENT MARKS: 50	TIME ALLOWED: 2 HRS

Answer the following questions

1- Write the sign (√) or (X) in the front of each statement: (4 marks)

I) Synthetic polymers are human-made polymers. (.....)

II) Gelatin is a biopolymer (.....)

III) Biopolymers are not produced by living organisms (.....)

IV) Polystyrene (PS) is a biopolymer (.....)

2- Define: monomer, polymer, and oligomer (4 marks)

3- Steps of free radical polymerization (6 marks)

4- Types of free radical polymerization initiators. (6 marks)

5- Describe the polyesters with examples (6 marks)

6- Classification of Polymers according to thermal behavior (4 marks)

7- Classification of biopolymers (6 marks)

8- Write the sign (√) or (X) in the front of each statement: (4 marks)

V) Synthetic polymers are human-made polymers. (.....)

VI) Gelatin is a biopolymer (.....)

VII) Biopolymers are not produced by living organisms (.....)

VIII) Polystyrene (PS) is a biopolymer (.....)

9- Write the chemical structure of the following biopolymers **(10 marks)**

i- Poly(lactic acid) ii- Poly(glycolic acid) iii- Poly(3-hydroxyalkanoic acids) iv) D-Lactide v) poly(glycolic acid) vi) poly(lactide co glycolide) vii) poly(butylene adipate

الممتحن أ.د. الرفاعي تناوى

	TANTA UNIVERSITY FACULTY OF SCIENCE BIOCHEMISTRY DEPARTMENT			
	EXAMINATION FOR LEVEL FOURTH STUDENTS OF CHEMISTRY/BIOCHEMISTRY			
	COURSE TITLE:	ANALYTICAL BIOCHEMISTRY		COURSE CODE: CH4149
DATE:	13-3-2021	FINAL	TOTAL ASSESSMENT MARKS: 50	TIME ALLOWED: 2 HOURS

Answer all the following questions:

I-Write about (22 marks) (with diagram if possible)

1- Steps of biochemical analysis
2- Common causes of systematic error
3- Health hazard sources
4- Liberation of Protein of interest that is located in the cell cytosol.
5- Use of ultracentrifuge for analysis of sample
6- Differential centrifugation
7- How can you perform Dialysis?
8- immunoprecipitation of a protein of interest
9- Detection of HIV antibody by ELISA
10-Use of flame photometer
11- determination of protein sequencing by mass spectrometry

II-Mention the cause of the following (5 marks)

1- For most biochemical applications, the rotor chamber must be kept at low temperatures.
2- Use of Sodium dodecyl sulphate in SDS-PAGE
3- Sequencing a protein.
4- Addition of thiol reagents or phenol during protein hydrolysis

III-Complete the following (13 marks)

1- Density gradient centrifugation types are .....and .....
2- Types of mechanical disruption process to break cells open include ....., ...and .....
3- The basic centrifuge consists of two components..... and .....
4- Types of rotors that may be used in low-speed centrifuge are .....and .....
5-Metal rotors may be constructed of ..... or .....
6- Marker of microsomes in subcellular fractionation studies is ..... while for cytosol, it is .....

IV- Write the scientific term of the following (10 marks)

1- Decrease in solubility of protein by addition of salt so protein is getting out of solution and precipitated.
2- Centrifuges that are designed for the benchtop and used for rapid pelleting of small samples.
3- A measure of the ability of the method to give a consistent result in spite of small changes in experimental parameters such as pH, temperature and the amount of reagents added.
4- The smallest concentration of the test analyte that can be distinguished from zero with a defined degree of confidence.
5- The movement of charged particles through an electrolyte when subjected to an electric field.
6- The preferred solid support media for horizontal electrophoresis

See next page.

7- An instrument that is used to scan the electrophoretogram and each band quantitated.
8- Type of electrophoresis in which both antigen and the antibody move towards each other under the influence of electric field and form precipitation lines at a place where the concentration of the two is equimolar.
9- The sedimentation constant unit
10- Method Based on the competition between labelled and unlabelled antigens to bind with antibody to form antigen antibody complexes and used to determine the concentration of unlabeled antigen.

Good Luck

Prof. Dr. Saleh Attia **Dr. Thoria Donia**

	TANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT OF CHEMISTRY			
	EXAMINATION FOR LEVEL- 4 STUDENTS - SPECIAL CHEMISTRY SECCTION			
	COURSE TITLE:	BIOCHEMISTRY 1		COURSE CODE:CH4107
DATE:	MARCH, 20, 2021	TERM : FIRST	TOTAL ASSESSMENT MARKS: 50	TIME ALLOWED: 2 HOURS

Answer the following questions:-

Q1:- *(14 Marks)*

a- Write the biosynthetic pathway of ***Pantothenic acid.*** *(4 Marks)*

b- Write the biochemical pathway and the overall reaction equation of the conversion of α-***ketobutyric acid*** into ***Propionyl- CoA.*** *(6 Marks)*

c- Choose the correct answer:

The reaction between ***Pyruvic acid*** and ***Glutamic acid*** in presence of ***PLP*** is catalyzed by: *(4 Marks)*

i- Amino acid oxidase. ***ii- Deaminase.***

iii- Transaminase ***iv- Transmethylase.***

(Write the reaction equation and the role of PLP)

Q2:- *(14 Marks)*

a- Write the ***Citric Acid Cycle,*** what are the steps that produce ***ATP.*** *(6 Marks)*

b- Give examples of reactions catalyzed by ***transketolase*** and ***transaldolase*** enzymes. *(4 Marks)*

c- Explain the ***Galactose*** metabolic pathway. *(4 Marks)*

Q3:- *(12 Marks)*

a- Explain by equations the action of ***Dehydratase*** on ***L-Serine.*** *(3 Marks)*

b- "***Fructose*** inters the glycolytic pathway as glyceraldehyde and dihydroxyacetone phosphate". Write the corresponding equations. *(4 Marks)*

c- Explain by an example the action of ***L-amino acid oxidase.*** Write the reaction equation and mechanism. *(5 Marks)*

Q4:- *(10 Marks)*

a- Write the pathway of ***Glycogenolysis.*** *(4 Marks)*

b- Explain by **equations** the ***absolute specificity.*** *(3 Marks)*

c- Choose the correct answer in the conversion of ***Pyruvic acid*** into ***OAA*** the reaction is catalyzed by: *(3 Marks)*

i- Deaminase. ***ii- Decarboxylase.***

iii- Dehydratase. ***iv- Carboxylase.***

(Write the reaction equation and Coenzyme)

GOOD LUCK

Dr. Yehia A. Hafez

	TANTA UNIVERSITY, FACULTY OF SCIENCE, DEPARTMENT OF CHEMISTRY		
	FINAL EXAMINATION FOR FOURTH-YEAR STUDENTS (DUAL MAJOR)		
	COURSE: SOILD STATE CHEMISTRY		CODE: CH 4143
17/03/2021	1st TERM	TOTAL ASSESSMENTMARKS: 50	Time Allowed: 2 HOURS

Answer all the following questions:

Question 1:.....(10 marks)

I - Iodine has an orthorhombic unit cell for which the a, b, and c lattice parameters are 0.479, 0.725, and 0.978 nm, respectively. **(6 Marks)**

(a) If the atomic packing factor and atomic radius are 0.547 and 0.177 nm, respectively, determine the number of atoms in each unit cell.

(b) The atomic weight of iodine is 126.91 g/mol; compute its theoretical density

II- In cubic unit cell label the origin and axes then draw **(1 Mark for each)**

(a) Plane $(0\bar{1}2)$ (b) Plane $(\bar{1}2\bar{1})$ (c) Direction $[00\bar{2}]$

(d) Direction $[2\bar{1}1]$

Question 2:.....(10 marks)

Discuss the following **(2 Marks for each)**

I- The unique characteristics and properties of nanoparticles

II- Increasing the temperature in conductivity of metal, semiconductor insulator

III- Adding the carbon to the iron in the steel production

VI- Hume-Rothery rules with examples

V- Basic idea of lithographic and its main problems

Question 3:.....(10 marks)

Compare between the following **(2 Marks for each)**

I- Ball milling and chemical vapor deposition

II- True and pseudo solids

III- Sol-gel and coprecipitation synthesis methods

IV- Cubic close packing and hexagonal close packing

V- Linear and planar defects

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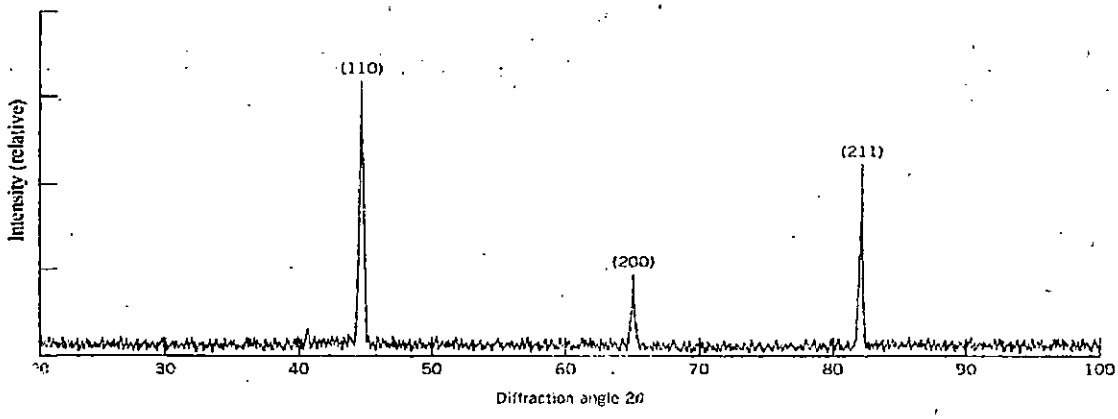
Question 4:.....**(10 marks)**

I- The following Figure shows an x-ray diffraction pattern for α-iron taken using a diffractometer and monochromatic x-radiation having a wavelength of 0.1542 nm; each diffraction peak on the pattern has been indexed. Compute the interplanar spacing for each set of planes indexed; also determine the lattice parameter of Fe for each of the peaks. **(6 Marks)**



II- Calculate the activation energy for vacancy formation in aluminum, given that the equilibrium number of vacancies at 500°C is 7.57×10^{23} m^{-3}. The atomic weight and density at 500°C for aluminum are, respectively, 26.98 g/mol and 2.62 g/cm^3. Boltzmann's constant is 8.62×10^{-5} eV/atom.K, Avogadro's number is 6.022×10^{23} atoms /mol, and the atomic weight of aluminum is 26.98 g/mol. **(4 Marks)**

Question 5:.....**(10 marks)**

Write short notes of following (2 Marks for each)

I- Surface plasmons of nanoparticles

II- Rapid cooling of manufactured cement is usually performed to 670 °C

III- Explain the polymorphic forms of carbon

IV- Write and explain the type of the defect of crystal that can

(a) decrease the density (b) increase the density (c) do not change the density

V- Main factors affecting the solvothermal synthesis

With Best Wishes **Dr. Abdelhamid M. El-Sawy**

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	Tanta University, Faculty of Science, Department of Chemistry		
	Examination of 4th Year Students, Faculty of Science- Materials Sciences (section)		
	Course Title: Solid-State Chemistry		Code: CH4143
Date: 10-March-2021	First Term	Total Marks: 50	Time: 2 Hours

Answer the following:

QI.True or False (√ & x), and if it is false correct it: ..... (30 marks)

1) Interstitial defects are belonging to stoichiometric ionic solids.
2) Metal deficient defects are belonging to stoichiometric point defects.
3) Smectic liquid crystal phase is not ordered crystals.
4) Insulators have very low energy gab.
5) Conduction in solids is electrons mechanism-only.
6) Liquid crystals (LC) are obeying Bragg's law for X-ray diffraction.
7) Conductors have very low energy gab (Eg).
8) n-type semiconductors are electron conduction mechanism.
9) Diamagnetic materials have no unpaired electron.
10) Polymerized crystalline arrays obey Bragg's law.
11) Potassium chloride is belonging to Ionic solids.
12) Graphite is Sp^2 hybridization and good insulator.
13) Deliquescent materials are vapor absorption matter.
14) Stoichiometric defects are belonging to point defect type.
15) Covalent crystals are bonded to each other by covalent bonds.

QII. Write a brief account on Only Two Item: .....(10 marks)

III.1. Atomic Packing efficiency (APF) .

III.2. Doping in semiconductors (*n-type and p-type*) semiconductors.

III.3. Different phases of liquid crystal.

QIII. Compare between each couple of the following; Select only TWO:.(10 marks)

1- Crystalline and Amorphous solids.
2- Diamond and graphite.
3- Frenkel and Schottky defects.

With my best wishes Prof.Dr. Khaled M.Elsabawy (Professor of Materials Sciences)

	Tanta University, Faculty of Science, Department of Chemistry		
	Examination of 4th Year Students, Faculty of Science- Materials Sciences (section)		
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With my best wishes Prof.Dr. Khaled M.Elsabawy (Professor of Materials Sciences)

TANTA UNIVERSITY
FACULTY OF SCIENCE
DEPARTMENT OF CHEMISTRY

EXAMINATION FOR LEVEL FOUR STUDENTS (SEMESTER 1) OF BIOCHEMISTRY, BOTANY, MICROBIOLOGY, ZOOLOGY, AND GEOLOGY

	Course Title:	BIOINORGANIC CHEMISTRY		Course Code: **CH4159**
DATE	22/3/2021	TERM: Summer	Total assessment marks: 50	Time Allowed: 2 HOUR

I- Determine the biological function of each of the following elements: (10 marks)

1- Calcium 2-Copper 3-Iron 4-Iodine 5-Chlorine

II- Complete each of the following: (20 marks)

1- ---------- is the principle cation within the cell, whereas ---------- --predominant in extracellular fluid.
2- Metal toxicity is ----------
3- Hyperparathyroidism usually causes an increase in----------
4- The active transport of glucose is coupled to the transport of---------- inside the cells.
5- ---------- and ---------- are among the disadvantages of cisplatin.
6. ---------- is an inherited condition that causes individuals to absorb and accumulate too much iron.

7. ---------- is characterized by sudden and severe exposure to toxic metals.
8. ---------- are a relatively new class of organometallic anticancer agents.
9. DNA adducts are mainly removed by ----------
10. ---------- refers to a decrease in plasma potassium level below ----------

III. Choose the correct answer: (20 marks)

1. Ceruloplasmin:

a- Acts primarily in the cells of the muscles.

b- Converts hemoglobin to myoglobin.

c- Changes Fe2+ to Fe3+.

d- Contains zinc.

2. To avoid heavy metal toxicity, individuals have to

a- Avoid eating organic food
b- Increase intake of sea food
c- Get used to smoking
d- None of the above

3. In which of these compartments is Na^+ concentration the lowest?

a- Interstitial fluid
b- Plasma
c- Intracellular fluid
d- Lymph

4. This hormone directly increases water reabsorption in the kidneys.

a- Aldosterone
b- Atrial natriuretic hormone
c- Antidiuretic hormone
d- Parathyroid hormone

5. Which of the following does not become involved with maintaining blood calcium balance?

a- Skeletal muscle
b- Bone
c- Kidneys
d- Intestine

6. Iodine deficiency may lead to development of:

a- Rickets
b- Goiter
c- Scurvy
d- Shingles

7. Ferritin and hemosiderin are

a- Storage forms of iron
b- Other forms of hemoglobin.
c- The iron-protein carriers in the blood.
d- Types of red blood cells.

8. **Iron can be absorbed in the intestine only as ferrous form. The reduction of ferric to ferrous can be brought about by**

a- Folic acid b- Ascorbic acid
c- Vitamin E d- Oxalate

9. Heme is iron containing

a- Catalase
b- Porphyrin derivative
c- Cupper
d- Oxidase

10. The sodium-potassium pump passes

a- More Na^+ out than K^+ in
b- K^+ out and Na^+ in on a one-for-one basis
c- Na^+ out and K^+ in on a one-for-one basis
d- K^+ and Na^+ in the same direction

Good Luck

EXAMINERS	PROF. DR. MOHAMED GABER ABU-EL AZM
	DR. THORIA A. AZIZ

	TANTA UNIVERSITY FACULTY OF SCIENCE CHEMISTRY DEPARTMENT		
	FINAL EXAM FOR SENIOR STUDENTS (CHEMISTRY SECTION)		
COURSE TITLE:	WATER TREATMENT (CH4127)		TIME ALLOWED:
DATE: MARCH 22, 2021	TERM: FIRST	TOTAL ASSESSMENT MARKS: 50	2 HOURS

Question 1: (38 Marks)

A) Mention the reason(s) for the following statements: (18 Marks)

a) During water sampling, the sample bottle should be filled gently.

b) pH influences the degree of ionization, and toxicity of ammonia if exist as a pollutant in surface water.

c) The addition of lime and aluminum sulfate during municipal water treatment.

d) Primary wastewater treatment is an important step.

e) Chlorine dioxide cannot be shipped but is generated on-site.

f) Water samples should be frozen in amounts needed for tests.

B) Explain only with diagram and equations the ion exchange for the removal of metals from wastewater. (4 Marks)

C) Explain with diagram the trickling filter. (4 Marks)

D) Explain with diagram the coagulation-filtration procedures for the removal of suspended material from water. (4 Marks)

E) Explain with diagram the reverse osmosis for water purification. (4 Marks)

F) Explain with diagram the ozone generation for water disinfection. (4 Marks)

Question 2: Write the scientific term that explain the meaning of the following: (12 Marks)

Statement	Scientific Term
1. It presents naturally in natural hot springs and it is also formed in surface waters from anaerobic decomposition of organic matter containing sulfur.	
2. Organic and mineral particulate matters that may exist in water and they do not pass through a filter.	
3. A place where a temperature of 30–35 °C is maintained for the optimum work of the anaerobic bacteria.	
4. The conversion of fixed nitrogen back into nitrogen gas by specialized soil bacteria.	
5. A quality parameter of water that indicates the total dissolved inorganic carbon and this parameter also buffers both natural and human induced pH changes.	
6. Subsurface waters in a zone of saturation that are or can be brought to the surface of the ground through wells.	

With Best wishes

Examiner: Dr. Wael A. Amer Dr. Marwa A. El-Ghobashy