
	Tanta University Faculty of Science Department of Botany		
	Theoretical Examination for 4th Year Students of Chem/ Botany		
1969	Course Title: Physiology of Algae	Course Code: BO 4123	
Date:	January 9/ 2023	Term: 1	Total Assessment Marks: 100 Time Allowed: 2h.

Question 1: Give short accounts on the followings (30 marks)

- 1- Chemical structure of Cyanocobalamin (vitamin B₁₂) and its function for algae.
- 2- Algal cultures in photobioreactors: uses, advantages and disadvantages.
- 3- The structure and function of chlorophyll molecule.
- 4- Stationary phase in the standard algal growth curve.
- 5- Light and combined nitrogen as factors affecting N₂ fixation in algae.
- 6- Photo-assimilation of acetate by algae.

Question 2: Complete the following sentences (20 marks)

- 1- Auxotrophic algae are.....
- 2- Xanthophyll pigments in algae are.....
- 3- Heterotrophy is defined as.....
- 4- Chlorophyll C is characterized by.....
- 5- Nitrogenase enzyme is inhibited by.....
- 6- Factor B is formed by.....
- 7- A continuous culture disadvantage is.....
- 8- Phycobiliproteins pigments are.....
- 9- Importance of Fe for algal growth is.....
- 10- A batch culture advantage is.....

Question 3: Correct the underlined words on the followings (15 marks)

- 1- The chlorophyll is extracted using chloroform and then identified by weighing.
- 2- Zinc and potassium are inorganic elements fused in the nitrogenase enzyme structure.
- 3- Closed algal cultures are easily exposed to contaminations.
- 4- The violaxanthin is the type of phycobiliproteins found in Rhodophyta.
- 5- Euglenophyta members are autotrophic algae while Chlorophyta are auxotrophic.
- 6- The inflow medium is added according to the generation time in batch culture systems.
- 7- Continuous cultures are used for mass production process like biodiesel.

- 8- **Stirring** is used to maintain the pH of an algal culture while **aeration** supplies it with energy.
- 9- Salinity is a controlling factor in **fresh water algal cultures**.
- 10- FAD and glutathione are needed for **nitrogen fixation process**.
- 11- In **chemotrophy**, light energy is converted into chemical energy of ATP and NADPH₂.

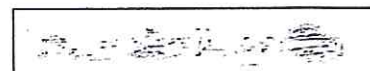
Question 4: Explain the mechanism of the following processes: (35 marks)

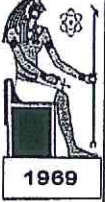

- 1- Photorespiration via glycolate pathway.
- 2- Nitrogen fixation in Cyanophyta.
- 3- Photodynamic effect and carotenoids pigments in photosynthesis.
- 4- Thiamine requirement in algal growth.
- 5- Formation of vitamin B₁₂ analogues.
- 6- Biological adaptation of algae to minimize photorespiration.
- 7- Growth of algae in continues culture systems.

End of Questions

All Best Wishes

Examiner Prof. Dr. Gehan Ahmed Ismail



 1969	TANTA UNIVERSITY, FACULTY OF SCIENCE, DEPARTMENT OF BOTANY			
	FINAL EXAM (FIRST TERM, JAN. 2023) FOR THE FOURTH YEAR (BOTANY CHEMISTRY)			
	COURSE TITLE	MUTATIONS AND GENOME CHANGES	COURSE CODE: BO4131	
	JAN. 2023	TOTAL ASSESSMENT MARKS: 100	TIME ALLOWED: 2 HRS	

Please answer all the following questions:

1) Write briefly about the following terms: _____ (20 marks)

- a) Duplication
- b) Translocation
- c) Inversion

2) Complete the following: _____ (30 marks)

- a) Telomere is defined as
- b) Acrocentric centromere is
- c) Centromere is
- d) The satellites are

3) Compare between the following: _____ (20 marks)

- a) Telocentric and metacentric centromeres
- b) Frameshift mutation and nonsense mutation


4) Describe each of the following: _____ (30 marks)

- a) Missense mutation
- b) Photo-reactivation repair
- c) Types of deletion

Best wishes,

Examiner:

Dr. Mohamed El-Esawi


	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:	25 JAN 2023	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) Aliphatic polyamide,
 - c) Poly(vinyl chloride),
 - d) Polyurethanes,
 - e) Epoxy resin.
- 2) Write short notes on the following: **(10 marks, 5 marks for each)**
- a) Suspension polymerization techniques,
 - b) Phenol-formaldehyde resin.
- 3) How can you prepare the following: **(10 marks, 5 marks for each)**
- a) Ion exchange resins,
 - b) Block copolymers.
- 4) Write short notes on the following: **(10 marks, 5 marks for each)**
- a) Vulcanized rubber,
 - b) Isomerization polymerization.
- 5) Choose the correct answers: **(10 marks, one mark for each)**
- i) What is the name of the organic compound used to prevent the polymerization of the monomers during storage?
 - a) Accelerator,
 - b) Initiator,
 - c) Inhibitor.
 - ii) What are the monomers used for the formation of Bakelite?
 - a) Urea & formaldehyde,
 - b) Melamine & formaldehyde,
 - c) Phenol & formaldehyde.
 - iii) What is the type of the initiator used in cationic polymerizations?

- a) Acid,
 - b) Base,
 - c) Free radical.
- iv) Which of the following is common anionic initiator?
- a) Benzoyl peroxide,
 - b) Azobisisobutyronitrile,
 - c) Na-metal.
- v) What are the monomers used for the formation of polyurethanes?
- a) Isobutylene & isoprene,
 - b) Diisocyanate & diol,
 - c) Diisocyanate & diamine.
- vi) What is the type of the polymerization of styrene with BuLi?
- a) Ring-opening polymerization,
 - b) Condensation polymerization,
 - c) Living polymerization.
- vii) Which is the characteristic of cross-linked polymers?
- a) Melting on heating,
 - b) Insoluble in all solvent,
 - c) Soluble in organic solvent.
- viii) Which is true regarding addition polymerization?
- a) Monomers contain three functional groups,
 - b) Monomers contain two functional groups,
 - c) Monomers contain olefinic groups.
- ix) What is the type of the polymerization used for the formation of polystyrene?
- a) Condensation polymerization,
 - b) Addition polymerization,
 - c) Stepwise polymerization.
- x) Which is the characteristic of thermoplastic s?
- a) Can be molded,
 - b) Cross-linking between chains,
 - c) Can not be melted.

With best regards,

EXAMINER	DR. AHMED AKELAH	
-----------------	------------------	--

	TANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT OF CHEMISTRY			
	EXAMINATION FOR B. SC. STUDENTS			
	COURSE TITLE: LASER CHEMISTRY			COURSE CODE: CH4113
DATE: 18TH JANUARY 2023	TERM: FIRST 22-23	TOTAL ASSESSMENT MARKS: 50	TIME: 2 HOURS	

Answer the following questions (10 marks each)

- 1- Tunneling of small particles is an important phenomenon of many chemical applications. Discuss this phenomenon and its application to explain splitting in ammonia vibrational spectral lines, non-linear Arrhenius plots and deviation from kinetic isotope effect.
- 2- The application of molecular rigidity effect on fluorescence efficiency in salmonella detection, DNA quantification and fingerprint modification.
- 3- The technique of thermal lensing is an important application on laser collimation. Draw a time- resolved thermal lensing experimental setup and trace upon using the technique to study singlet oxygen sensitization kinetics.
- 4- Briefly describe each of the following:
 - (a) The technique of polarized fluorescence and its application in studying drug-protein interactions.
 - (b) The technique of single photon counting and its application in lifetime measurement.
 - (c) Laser applications in isotope separation
 - (d) The synthesis of vinyl chloride from 1,2-dichloroethane is an important multibillion industrial process demonstrating the advantages of laser applications. Write the reaction scheme and mention the advantages of laser application in comparison with thermal applications.
- 5 - Draw and label each of the following:
 - (a) Ground and the first two excited states in oxygen molecule giving the appropriate notations.
 - (b) Energy levels in He-Ne laser
 - (c) Energy levels in excimer lasers
 - (d) Energy levels in salicylamide as a proton transfer dye laser
 - (e) Energy levels in carbon dioxide lasers

Prof. Dr. El-Zeiny Mousa Ebeid and Prof. Dr. Samy Abdallah El-Daly



Tanta University – Faculty of Science – Chemistry Department		
Final Exam for Fourth year students (Chemistry, Material Science Section)		
Code: CH4123	Course Title: Industrial Chemistry	
January 2023	Note: Exam consists of 6 pages	
Date: 28/12/2022	Total Assessment Marks: 100	Time Allowed: 2 h

Part I: Organic Industrial Chemistry (50 Marks) تصحيح إلكتروني

Choose the correct answer: -

- Formaldehyde is as a feedstock for industry
a. dyes b. detergents c. Plastic d. explosives
- Dehydrogenation of methanol by catalytic oxidation is an industrial method for the manufacture of
a. Methane b. formalin c. ethanol d. acetic acid
- Cyclohexanone is a starting material for the synthesis of
a. tramadol b. aspirin c. prilocaine d. sildenafil
- Liquefied petroleum gases (LPG) consists of mixture
a. pentane and propane c. propane and hexane
b. propane and butane d. butane and pentane
-are unstable and also improve the anti-knock tendencies of gasoline
a. Olefins c. Sulfur Compounds
b. Paraffins d. Aromatics
- Synthesis gas is a mixture of
a. CO₂ & H₂O b. NH₃ & O₂ c. H₂ & CO d. H₂ & NH₃
- Acetylation of p-aminophenol gives
a. Pethidine b. Paracetamol c. Novocain d. Aspirin
- Determining the amount of hydrogen required for a compound to be converted into a saturated
a. acid hydrolysis c. saponification Value
b. cracking test d. unsaturation test
- is the most common solvent used for vegetable oil extraction
a. Ethyl acetate b. Hexane c. Ethanol d. Methanol

من فضلك إقلب الصفحة

20. When 2,6 dimethylaniline reacts with chloroacetyl chloride followed by reaction with diethyl amine gives
- a. pethidine b. Lidocaine c. cocaine d. tramadol
21. The spent lye in soap manufacturing process is.....
- a. brine solution layer c. brine/NaOH layer
b. NaOH/H₂O layer d. brine/glycerin layer
22. Sulphapyrimidine is used as
- a. antibacterial agent c. anticancer agent
b. anesthetic agent d. anti-inflammatory agent
23. In vegetable oil extraction, NaOH is used for
- a. separation of glycerol c. soap formation
b. neutralization of fatty acids d. b,c
24. During the manufacture of solid detergents, raw materials are mixed together during
- a. postdosing step c. slurry making step
b. spray drying step d. none of these
25. Palmitic acid is
- a. CH₃(CH₂)₁₂COOH c. CH₃(CH₂)₁₀COOH
b. CH₃(CH₂)₁₆COOH d. none of these
26. Alkylation of barbituric acid gives
- a. hypnotic drug c. antibacterial drug
b. anticancer drug d. antifungal drug
27. According to inorganic hypothesis, petroleum could be formed in the form of
- a. carbides c. hydrocarbons
b. carbon dioxide d. a,b
28. is used to reduce engine knocking and increase the fuel's octane rating
- a. LPG c. Anti-knock agent
b. Octane number d. None of these

29. For $C_{14} - C_{20}$ fraction, it is used for
- | | |
|----------------|---------------------|
| a. jet fuel | c. lubricating oils |
| b. diesel fuel | d. ships fuel |
30. During Cativa process for the production of acetic acid, is used as catalyst
- | | |
|-------------|--------------|
| a. Platinum | c. Ruthenium |
| b. Rhodium | d. Iridium |
31. Phenylglycine is a starting material for the synthesis of
- | | |
|---------------|----------------|
| a. Ampicillin | c. Amoxicillin |
| b. Pirocaine | d. Novocaine |
32. Tedious, energy sapping, rough, largely unscientific, inefficient, and yielding poor quality extracted oil. All these are in accordance with
- | | |
|---------------------------------|------------------------------|
| a. conventional method | c. solvent extraction method |
| b. mechanical expression method | d. old traditional method |
33. Partial oxidation of methane gives
- | | |
|-----------|------------------|
| a. H_2O | c. Syn-gas |
| b. CO_2 | d. none of these |
34. Sulfonation of acetanilide followed by reaction with 2-aminopyrimidine and hydrolysis gives
- | | |
|---------------------|-------------------|
| a. Sulphapyrimidine | c. Sulphanilamide |
| b. sulphathiazole | d. Sildenafil |
35. Reaction of benzyl cyanide with methyl-bis(2-chloroethyl)amine followed by hydrolysis and esterification with ethanol gives
- | | |
|--------------|---------------|
| a. Tramadol | c. Ibuprofen |
| b. Pethidine | d. Sildenafil |
36. In vegetable oil processing, degumming process is carried out using
- | | |
|--------------------|---------------------|
| a. glycerol | c. hot water |
| b. Phosphoric acid | d. sodium hydroxide |

من فضلك إقلب الصفحة

37. In viscous rayon production, wood pulp is treated with aqueous sodium hydroxide then treated with carbon disulfide to form
- a. Formaldehyde
b. Methanol
c. Acetic acid
d. Xanthate
38. One example for unsaturated fatty acids is
- a. Lauric acid
b. Myristic acid
c. Palmitic acid
d. none of these
39. When propene reacts with chlorine and hypochlorous acid followed by hydrolysis with sodium hydroxide is formed
- a. Glycerol
b. Methane
c. Acetic acid
d. Urea-formaldehyde resin
40. Deodorizing step in vegetable oil refining is carried out to remove volatile components, mainly
- a. soap
b. Glycerol
c. aldehydes & ketones
d. free fatty acids

Mark (✓) or (×) (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
- 7- The saponification process is an exothermic process.
- 8- Detergents are structurally like soaps but differ in the water-soluble part.
- 9- Aspirin inhibits the production of cell walls of bacteria.
- 10- Olefins are unstable and improve the anti-knock tendencies of gasoline.

من فضلك إقلب الصفحة

Part I: Inorganic Industrial Chemistry (50 Marks)

Question one:

(A) Describe with chemical equations the reactions that occur to produce **Only Two** of the following:

1. H_2SO_4 by contact process
2. H_3PO_4 by wet process.
3. Syn gas by autothermal reforming of methane.

(B) Mention three uses of each of the following (H_2SO_4 - H_3PO_4 - Syn gas).

Question two:

(A) In the production of ammonia by Haber process in industry

- 1) write the balanced chemical equation for the manufacture of ammonia.
- 2) How much hydrogen would be in 400 liters (L) of gaseous mixture.

(B) Choose the correct answer:

1- Carrying out this reaction at high temperature in the presence of a catalyst is in order to.....

- a) Speed up the conversion reaction to reach equilibrium soon, even though with low amount of ammonia
- b) Increase the conversion to ammonia in each pass
- c) Decrease the speed of the conversion reaction, so the evolved energy could be dissipated as the reaction goes on
- d) b and c

2- The reaction $2\text{NaCl} + 2\text{H}_2\text{O} \rightarrow 2\text{NaOH} + \text{Cl}_2 + \text{H}_2$ is

- a) Oxidation-reduction reaction
- b) Electrochemical reaction.
- c) Used in industry for coproduction of Cl_2 and caustic soda.
- d) All the above.

3- In industrial production of phosphoric acid by the wet process, the crushed phosphate rock (apatite) is acidified with phosphoric acid before adding sulphuric acid. This is to prevent

- a) Formation of soluble salts such as MgSO_4 or iron sulphate in the produced phosphoric acid solution.
- b) precipitation of other salts with gypsum.
- c) formation of the Plaster gypsum layer on the surface of the crushed apatite.
- d) all the above three

(C) A plant that consumes 1170 tons of NaCl produces how many tons of NaOH .

(D) Describe the main uses of NH_3 - Cl_2 - H_2 .

إنتهت الأسئلة كل الأمنيات بالتوفيق والنجاح

Prof. Dr Samer Kandel

Dr. Hamada Mandour