	TANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT OF CHEMISTRY			
	Examination for 4th Year Biochemistry Students			
	COURSE TITLE:	Biological Oxidation		
DATE: 25 - 1 - 2023	COURSE CODE: BC4117	TERM: FIRST TERM	MARKS: 50	TIME ALLOWED: 2 HOURS

I. Show by diagram: (20 Marks)

1. Some electrons from cytosolic NADH transported into the mitochondria to enter the electron transport pathway by two different shuttles, explain.
2. Cyclic and Z-scheme phosphorylation in green plants.
3. Nitric oxide synthetase and role of NO as a vasodilator in response to neurotransmitters.
4. Calvin cycle.
5. Enzymatic antioxidant defense mechanism.


II. Discuss the following questions: (20 Marks)

1. Biosynthesis of nitric oxide and its protective and cytotoxic effects.
2. ATP synthase complex and its molecular mechanism of action.
3. Oxidative stress causes damage to three main biological components, explain. And mention the disorders that could be associated with it.
4. Chemiosmosis and uncouplers.
5. Mechanism of oxidative phosphorylation and the order of the respiratory chain.

III. Complete the following sentences: (10 Marks)

1. Factors affecting oxidative phosphorylation are.....and.....
2. The three levels of antioxidant defense mechanisms,....., and.....
3. Cyanobacteria carry out photosynthesis to produce their own energy using.....
4. Chlorophyll (a) hasgroup, while chlorophyll (b) hasgroup.
5. Non-enzymatic antioxidants may be.....,and.....
6. Complex IV contain.....,.....,.....and.....
7. Detergent treatment of respiratory chain complexes could causeand.....
8. Proton-motive force is.....
9. The movement of ions across the membrane depends on a combination of two factors.....and.....
10. The main sources of free radicals.....,.....,.....and

Best Wishes
Prof. Dr. Karim Samy


	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	
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	TANTA UNIVERSITY ALCULTY OF SCIENCE DEPARTMENT OF CHEMISTRY			
	EXAMINATION FOR LEVEL- 4 STUDENTS - SPECIAL CHEMISTRY SECCTION			
	COURSE TITLE:	BIOCHEMISTRY- 1		COURSE CODE: CH4107
DATE:	JAN. 14, 2023	TERM : FIRST	TOTAL ASSESSMENT MARKS: 50	TIME ALLOWED: 2 HOURS

Answer the following questions:-

Q1:- Write down on the following:

(12 Marks)

a- Lactic acid and Alcohol fermentations.

(4 Marks)

b- " PPP is an alternative pathway for degradation of D-glucose via Five carbon sugars and generation of $NADPH, H^+$ ". Write the *non-oxidative* pathway. (4 Marks)

c- The biosynthetic pathway of *Pantothenic Acid*.

(4 Marks)

Q2:- Answer the following:

(14 Marks)

a- Explain by equations how the *Gluconeogenic pathway* takes place bypassing the irreversible steps of glycolysis". (4 Marks)

b- Write the *biochemical pathway* including *enzymes, coenzymes and the reaction equation* of the conversion of α -Ketobutyric acid into Propionyl- CoA. (5 Marks)

c- Choose the correct answer: (5 Marks)

The reaction between *Glutamic Acid* and *Pyruvic Acid* in presence of *PLP* is catalyzed by: *i- Deaminase. ii- Transmethylase. iii- Aminotransferase.*

iv- Monoamine oxidase. (Write the reaction equation and the role of PLP).

Q3:-

(10 Marks)

a- Write the pathway of *Glycogenolysis*.

(4 Marks)

b- Explain by equations the *absolute* and *bond specificity* of enzymes. (4 Marks)

c- Choose the correct answer in the conversion of *Pyruvic Acid* into *OAA* the reaction is catalyzed by:

(2 Marks)

i- Deaminase.

ii- Decarboxylase.

iii- Dehydratase.

iv- Carboxylase.

(Write the reaction equation and Coenzyme)

Q4:- Explain by equations the following:

(14 Marks)

a- *Glyceraldehyde-3-phosphate* forms *Pyruvic acid*.

(5 Marks)

b- *Galactose* metabolism requires *Glycosyl epimerase* enzyme.


(4 Marks)

c- The *Citric Acid Cycle* (CAA), calculating the ATP formed.

(5 Marks)

GOOD LUCK

Dr. Yehia A. Hafez

	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