


Answer the following questions:

- 1- (i) Compare between each of the following (Chemical composition, properties, applications):
- a- Soft paste porcelain and electrical porcelain (2marks)
 - b- Earthenwares and Stonewares. (2marks)
 - c- Chrome–magnesite refractories and Silica refractories. (2marks)
- (ii) Discuss Zachariasen' s four rules for an oxide, A_mO_n , to form a glass. (4marks)
- 2-(i) Explain why:
- a-The addition of gypsum to Portland cement (3marks)
 - b-The content of MgO is usually limited to either 4 or 5% to Portland cement. (3marks)
- (ii) Define the sintering process of green body ceramics. Discuss some possible refinements (improving) methods of the sintering process. (4marks)
- 3- (i) Discuss the following(Chemical composition, properties, applications):
- a- High-temperature heating elements and electrodes. (3marks)
 - b- Piezoelectric ceramics (3marks)
- (ii) Discuss briefly Portland cement and its types (Chemical composition, and applications). (4marks)
- 4- (i) Discuss the structure of Sodium Aluminosilicate Glasses (draw the structure). (3marks)
- (ii) Compare between partially stabilized zirconia (PSZ) and fully stabilized zirconia (FSZ) (Chemical composition, phases, properties and applications). (3marks)
- (iii) Discuss types of additives and its properties in the Refractory processing. (4marks)
- 5- (i)define by the chemical equations:
- a- Two methods for the production of zirconia from the minerals zircon ($ZrSiO_4$). (3marks)
 - b- One method for the separation alumina or aluminum hydroxides from bauxite. (3marks)
- (ii) Plot the volume as a function of temperature diagram for the liquid transitions to a solid in glass formation. (define(4marks)

Good Luck

Examiner: Prof.Dr: M.H.Shaaban

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	TANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT OF CHEMISTRY		
	FINAL EXAM FOR CRDIT HOUR STUDENTS		
1989	COURSE TITLE: LASER CHEMISTRY		COURSE CODE: CH4113
DATE: 27 JANUARY, 2014	TERM: FIRST	TOTAL ASSESSMENT MARKS: 50	TIME: 2 HOURS

Answer the following questions (10 marks each):

1- In the thermal lensing:

- Write equation of intensity change as a function of time.
- Draw the experimental setup of the apparatus used.
- Draw thermal lensing trace output
- Draw a typical energy diagram for singlet oxygen sensitization showing the rate determining step in the sensitization process.

2- Draw each of the following:

- Proton transfer process in salicylamide as a model of proton transfer dye laser.
- The chemical structure of methyl aminolevulinate (MAL)
- The chemical structure of MUCAP reagent used in salmonella detection.
- A modified Jablonoskii diagram.
- The relative energies and notations of the ground and the first two excited states in O₂.

3- In the application of lasers, explain the following:

- The reaction scheme in the photosynthesis of vinyl chloride using 1, 2 dichloroethane (DCE) as a starting material.
- Impurity removal of H₂S from syngas.
- Modification of Teflon and polymethyl methacrylate (PMMA) surfaces.
- Laser capture micro dissection (LCM).
- Laser lithotripsy of calculi.


4- In fluorescence activated cell sorting (FACS), put numbers in the following table below each component according to their sequence in the measuring apparatus then transfer the Table to your answer sheet:

avelength detector and analyzer	Collection tubes	Laser excitation	Mixed cell populations bound to antibodies	Electron sputtering system	Nozzle	Charged plates

5- Among the factors enhancing ic and vc is molecular flexibility, explain how this principal is applied in each of the following: (a) Fingerprint development (b) DNA quantification (c) Salmonella detection by MUCAP reagent.

End of Exam

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	TANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT OF CHEMISTRY			
	EXAMINATION FOR (SENIORS) STUDENTS OF CHEM/BIOCHEM SECTION			
	COURSE TITLE:	BIOCHEMISTRY 1		COURSE CODE: 4107
DATE: 11 -1.15	JANUARY, 2015	FIRST TERM EXAM	TOTAL ASSESSMENT MARKS: 50	TIME ALLOWED: 2 HOURS

Answer the following questions:

I- A-Explain each of the following:- (5 marks each)

- i—Glycosyl transferases catalyze the transfer of activated carbohydrate moieties from a donor to an acceptor molecule.
- ii- Certain lytic enzymes exhibit high order group specificity .
- iii- Niacin is required for the synthesis of the active forms of vitamin B3.
- iv- Pantothenic acid is required for the synthesis of Coenzyme A.
- v- NAD⁺ can be degraded by two pathways ; the product is nicotinamide by either pathway.
- vi- Citric acid cycle acts as the pathway for the oxidation of acetyl -CoA to CO₂ and water.
- vii- Gluconeogenic mechanism clears the products of the metabolism of other tissues from the blood, e.g. lactate.

II- Choose the correct answer (s). Explain by equation(s) (5 marks each)

- i- A major function of TPP is:
 - a) making amino- acids
 - b) a cofactor for PDHc and α KGDHc catalyzed reactions
 - c) Production of NAD⁺
 - d) decarboxylation of α -ketoglutaric acid

- ii- Coenzyme for deaminase or dehydratase of serine yields :-
 - a) ammonia
 - b) pyruvic acid
 - c) threonine
 - d) CO₂

- iii- In glycolysis , the conversion of fructose 1,6- biphosphate to immediate products(s) involves
 - a) C3-C4 bond cleavage
 - b) dehydration
 - c) phosphoryl transfer
 - d) isomerization

