	TANTA UNIVERSITY **FACULTY OF SCIENCE** **DEPARTMENT CHEMISTRY – BIOCHEMISTRY SECTION**			
	EXAMINATION FOR JUNIORS (3RD YEAR) STUDENTS OF BIOCHEMISTRY SPECIAL AND DOUBLE			
	COURSE TITLE: Amino acids and protein metabolism		**COURSE CODE: BC3103**	
DATE :18	**JANUARY 2017-2018**	**TERM: FIRST**	**TOTAL ASSESSMENT MARKS: 150**	**TIME ALLOWED: 2 HOUR**

Answer all the following questions: (10 mark each)
I) Give brief account on:

1- Post- translational modification and its importance?
2- What is the role of t RNA, r RNA and m RNA, in protein synthesis?
3- What is the difference between point mutation and frame-shift mutation?
4- What is the diagnostic value of aminotransferases?
5- Haw amino acids are transported into cells?

II) By equations only with full information illustrate the following:

1- Combined actions of aminotransferase and glutamate dehydrogenase reactions?
2 – Conversion of D-amino acid to L-amino acid?
3 – Reactions of urea cycle?
4 – Fate of fumarate produced by urea cycle?
5 – Degradation of methionine?

III) 1- What is protein turnover and overall nitrogen metabolism?
2- What is cellular compartmentalization of metabolic pathways? Giving examples?
3- Illustrate examples of metabolic defects in amino acid metabolism?
4- What is VMA? Illustrate its source? What is its diagnostic importance?
5- How Serotonin and melatonin be synthesized?

<div dir="rtl">أطيب الأمنيات بالنجاح و التوفيق</div>

<div dir="rtl">- ا. د: أفراح فتحي سلامه</div>

Tanat university
Faculty of Science
Chemistry Department

First Term

Dec. 2017
Time All . 2 hrs
Course No. : CH 3153

Final Examination of Organic chemistry for 3th year students

All Double Major

Hetero Cyclic

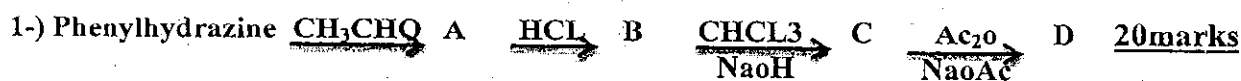Total 100 marks

1-) *Answer by equations the following reactions*   *Each item 5 marks*

a-) From phenol how can you prepare benzofuran .

b-) $\propto$ – picoline is more acidic than β picoline . Give examples .

c-) Ring opening of piperidine ring . Show by mechanism .

d-) Knorr – pyrrole synthesis .

e-) Pyridine fails to undergo acylation or alkylation (explain)

2-)   *Each item 5 marks (a,b,c,e)*

a-) from Glyerol how can you prepare quinoline

b-) Trimerization of pyrrole

c-) how can you prepare 3-nitro furan

d-) write equtions and identify the products A,B,C (name all the products)

1-) Phenylhydrazine $\xrightarrow{CH_3CHO}$ A $\xrightarrow{HCL}$ B $\xrightarrow[NaoH]{CHCL3}$ C $\xrightarrow[NaoAc]{Ac_2O}$ D   20marks

2-) 1,3 butadiene $\xrightarrow{HCN}$ A $\xrightarrow{400c}$ B $\xrightarrow{CH_3I}$ C   9 marks

e-) show the oxidation and reduction of thiophene . NaoH

3-)   *Each item 5 marks(a,b,c,d)*

a-) From o-nitrotoluene how to prepare Indole

b-) Draw the resonating structure of pyridine-1-oxide

c-) synthesis of tryptophan

d-) convert pyridine to 4-nitropyridine

e-) Arrange the following compounds according to basisty with explanation :   6marks

   Triethylamine , pyrrole , pyridine and pepridine

With by best wishes

Dr. Mohamed Hamed   *Prof. Dr. Mahmoud Fahmy*

TANTA UNIVERSITY
FACULTY OF SCIENCE
DEPARTMENT OF GEOLOGY

EXAMINATION FOR JENOIR (THIRD YEAR) STUDENTS OF CHEMISTRY AND GEOLOGY SECTION

1965	COURSE TITLE:	Metamorphic Petrology (2)	COURSE CODE: GE3105
DATE:	26-12- 2017	TERM: FRIST	TOTAL ASSESSMENT MARKS: 100	TIME ALLOWED: 2 HOURS

Answer the following questions, illustrating your answers with diagrams if it possible:

1-Write short notes on the following:

a- Lowr and upper limit of metamorphism---(8 marks)

b- Diagnostic minerals of very low grade and high grade metamorphism----- (8 marks)

c- Textures of thermal metamorphiam---(9 marks)

d- Metamorphic facies of regional metamorphism --------------------------------(12 marks)

f- Classification of metamorphic rocks based on textures--------------------------(12 marks)

g- Subduction zone metamorphism and arc-trench zone metamorphism---------(12 marks)

2-Complete the following: ---(15 marks)

a- Polymorphic reaction (solid-solid reaction)...............such as....................

b- Devolatilization reactions...............such as ....

c- Metasomatic exchange reactions is ....such as ....

d- The component M in AFM diagram is ....

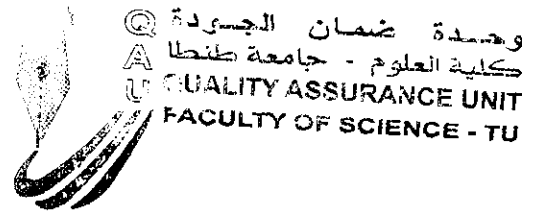e- The component F in ACF diagram is.................., while in AFM diagram

is.......... ....

3- Show difference between ACF and AKF graphical representation diagrams and give

examples for each diagram.--(15 marks)

Best wishes

Examiners:

Prof. Gaafar El Bahariya   Dr. Ismail Thabet

Answer the following questions: (50 Marks)

1. a) Calculate K and ΔG for the following reaction at $25^0 C$ (5 Marks)

$$Pd_{(s)} + Cu^{2+}{}_{(aq)} \rightarrow Pd^{2+}{}_{(aq)} + Cu_{(s)} \quad Pd/Pd^{2+} = 0.126 \text{ V and } Cu/Cu^{2+} = 0.34 \text{ V}$$

b) Does the reaction goes spontaneously   (5 Marks)

$$2I^-{}_{(aq)} + Cu^{2+}{}_{(aq)} \rightarrow I_{2(s)} + Cu_{(s)} \qquad I_2/I^- = 0.53 \text{ V and } Cu/Cu^{2+} = 0.34 \text{ V}$$
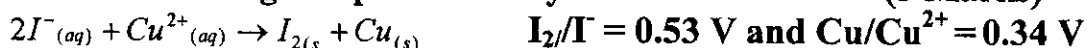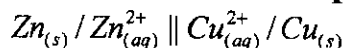
Illustrate your answer.

c) What is the electrode potential of zinc electrode in which the concentration of Zn^{2+} ions is 0.01 M ($E^0{}_{Zn^{2+}/Zn} = -0.76$ V)   (5 Marks)

2. a) Mention the basic principle of fuel cell and discuss the four types of fuel cells   (10 Marks)

3) A galvanic cell can be represented by   (10 Marks)

$$Zn_{(s)} / Zn^{2+}_{(aq)} \parallel Cu^{2+}_{(aq)} / Cu_{(s)}$$

i) Draw a diagram for the cell, Illustrate the direction of flow of current, electron flow and ion flow .

ii) Clarify the sign of the cathode and anode .

iii) Predict the cathode reaction , the anode reaction and the net cell reaction

iv) What is the name of phase boundary represented as $\parallel$ and why it is present

4) Explain the followings with the aids of equations   (15 Marks)
   i)   Lead acid storage battery
   ii) metal-ion electrode
   iii) Hydrogen electrode.
   iv)   Concentration cell
   v)   Nernst equation and its application

Good luck

EXAMINERS	PROF. DR. IBRAHIM SHIBL
	PROF. DR. YOUSSEF MOHARRAM

TANTA UNIVERSITY
FACULTY OF SCIENCE
DEPARTMENT OF CHEMISTRY

EXAMINATION FOR JUNIOR (THIRD LEVEL) STUDENTS OF CHEMISTRY/BIOCHEMISTRY

COURSE TITLE:	NUCLEIC ACIDS METABOLISM	COURSE CODE: BC3105
DATE: 26.12.2017	TERM: FIRST	TOTAL ASSESSMENT MARKS: 50	TIME ALLOWED: 2 HOURS

ANSWER THE FOLLOWING QUESTIONS (THE EXAM IS IN TWO PAGES)

I. **A. Match from column (A) what is suitable from column (B):**   (10 marks)

Column (A)	Column (B)
1. *E. coli* DNA polymerase I	a. A base derivative which can serve as a precursor for the synthesis of two of the other pyrimidine base derivatives
2. DNA polymerase α	b. Are composed of an octamer of histones and ~147 bp of DNA
3. Topoisomerases	c. Is efficient at nick translation
4. *E. coli* DNA polymerase III	d. Is involved in the conversion of a ribonucleotide to a deoxyribonucleotide
5. Nucleosomes	e. A very rare genetic condition caused by mutations of *DHODH*, the gene encoding dihydroorotate dehydrogenase
6. Febuxostat	f. Cleaves a nucleoside with the production of ribose 1-phosphate
7. Uridine monophosphate (UMP)	g. Change the linking number (L) of a DNA molecule
8. Miller syndrome	h. Is the principal prokaryotic DNA polymerase in chromosomal DNA replication
9. A nucleoside phosphorylase	i. Is superior to allopurinol in lowering uric acid production
10. Thioredoxin	j. An eukaryotic DNA polymerase with an intrinsic primase activity

B. All known DNA polymerases catalyze synthesis only in the 5′ → 3′ direction. Nevertheless, during semiconservative DNA replication in the cell, they are able to catalyze the synthesis of both daughter chains, which would appear to require synthesis in the 3′ → 5′ direction.

Explain the process that occurs in the cell that allows for synthesis of both daughter chains by DNA polymerases.   **(5 marks)**

II. A. Some patients with gout suffer from a defect in PRPP amidotransferase.
What reaction(s) does this enzyme catalyze?   **(3 marks)**
Indicate what could be the defect in the enzyme that might lead to gout?
     (2 marks)

COURSE	SURFACE CHEMISTRY AND CATALYSIS	CODE: CH 3143

DATE	DEC 31, 2017	TERM: FIRST	TOTAL ASSESSMENT MARKS: 50	TIME ALLOWED: 2 H

Please answer these questions

Question (1): Choose the correct answer of the followings   (10 marks, 1 for each)

1) Which of the following best describes the movement of pollen grains in water?
   a) diffusion   b) photosynthesis   c) Brownian motion   d) distillation

2) As the concentration of surfactant increases to the critical micelle concentration, the molecules are collected into a structure called:
   a) ball   b) sphere of ions   c) micelles   d) dirt particle

3) Physical adsorption is directly proportional to the
   a) pressure   b) temperature   c) volume   d) concentration

4) Foam is a colloidal system in which gas bubbles are dispersed in
   a) gas   b) liquid   c) solid   d) none of these

5) The dispersion medium for the formation of fog is a liquid
   a) True   b) False

6) Which of the following statement is correct regarding chemical adsorption?
   a) it is fast   c) it is reversible
   b) it forms multimolecular layers   d) it has high heat of adsorption

7) The use of membranes for separating impurities from colloidal suspension is
   a) sedimentation   b) ultrasonic   c) dialysis   d) successive cooling

8) Among the Langmuir assumptions is an interaction between the adsorbed molecules on the surface
   a) True   b) False   c) none of these

9) Aggregation methods for preparation of colloids involve
   a) Ultrasonic waves   b) solvent exchange   c) mechanical dispersion   d) Bredig's arc method

10) Adsorption is the a phenomenon in which a substance
   a) remains close to other substance   c) goes into the body of other substance
   b) accumulate on the surface of other substance   d) none of these

Question (2) Mark (√) or (X) as appropriate   (10 marks, 1 for each)

1) The sedimentation rate is affected by medium viscosity.
2) The BET adsorption equation includes the parameters P^o and ΔH_L.
3) V_m is the volume of gas required for the surface to be fully occupied .
4) The CMC of surfactant solution is directly proportional to the chain length .
5) The surface coverage (Θ) of a solid catalyst is equal to $(1+KP) / KP$.
6) The rod-like micelle is formed below the CMC.
7) The molar conductivity of surfactant solution increases with the concentration up to CMC.
8) The mean displacement of colloidal particles is inversely proportional to the diffusion coefficient.
9) The intercept of the relationship 1/V vs 1/P of Langmuir isotherm is $1/ bV_m$
10) The tendency for particles to migrate from a region of high concentration to a region of low concentration is controlled by the translation diffusion rate.

بقى الاسئلة فى الخلف

Question (3): Complete (10 marks)

1) The derivation of Stokes law assumes that ....
2) Sols particles are obtained when the rate of nucleation is............... and the rate of crystal growth is ....
3) Physical adsorption is accompanied by .... heat of adsorption
4) Capillary rise method is used for the determination of ....
5) Surface area of a solid surface is determined by .... method
6) The sedimentation rate is directly proportional to ....
7) The surfactant that has multiple charges is called ....
8) Scanning electron microscope is operating by a beam of ....
9) Chemical adsorption leads to the formation of .... layer of gas molecules.

Question (4): Give the reason for : (5 marks, 1 for each)

1) The use of membranes in dialysis.
2) The reversibility of physical adsorption.
3) Adsorption of long-chain alcohol at the water-air interface.
4) The decrease in CMC of ionic surfactant by addition of simple salt.
5) When a beam of light is directed to a colloidal dispersion, some of light is scattered.

Question (5): Provide the scientific term for: (5 marks, 1 for each)

1) Dispersion of dust particles in air.
2) Redispersion of coagulated form of colloids .
3) The random motion of colloidal particles in their medium.
4) Addition of ethanol to an aqueous salt solution to form sol.
5) Type of adsorption that form multilayer of gas molecules on solid surface.

Question (4): Discuss (10 marks, 2 for each)

1) Fick's law.
2) Electrodialysis
3) Chemical adsorption.
4) Factors affecting the CMC.
5) Assumptions of Langmuir theory .

Good Luck

Examinars: Prof. Mohamed Salem , Prof. Nehal Atef

Question (3): Complete   (10 marks)

1) The derivation of Stokes law assumes that ....
2) Sols particles are obtained when the rate of nucleation is............... and the rate of crystal growth is ....
3) Physical adsorption is accompanied by .... heat of adsorption
4) Capillary rise method is used for the determination of ....
5) Surface area of a solid surface is determined by .... method
6) The sedimentation rate is directly proportional to ....
7) The surfactant that has multiple charges is called ....
8) Scanning electron microscope is operating by a beam of ....
9) Chemical adsorption leads to the formation of .... layer of gas molecules.

Question (4): Give the reason for :   (5 marks, 1 for each)

1) The use of membranes in dialysis.
2) The reversibility of physical adsorption.
3) Adsorption of long-chain alcohol at the water-air interface.
4) The decrease in CMC of ionic surfactant by addition of simple salt.
5) When a beam of light is directed to a colloidal dispersion, some of light is scattered.

Question (5): Provide the scientific term for: (5 marks, 1 for each)

1) Dispersion of dust particles in air.
2) Redispersion of coagulated form of colloids.
3) The random motion of colloidal particles in their medium.
4) Addition of ethanol to an aqueous salt solution to form sol.
5) Type of adsorption that form multilayer of gas molecules on solid surface.

Question (4): Discuss   (10 marks, 2 for each)

1) Fick's law.
2) Electrodialysis
3) Chemical adsorption.
4) Factors affecting the CMC.
5) Assumptions of Langmuir theory .

Good Luck

Examinars: Prof. Mohamed Salem , Prof. Nehal Atef

2

Please answer these questions

Question (1): Choose the correct answer of the followings   (10 marks, 1 for each)

1) Which of the following best describes the movement of pollen grains in water?
   a) diffusion   b) photosynthesis   c) Brownian motion   d) distillation

2) As the concentration of surfactant increases to the critical micelle concentration, the molecules are collected into a structure called:
   a) ball   b) sphere of ions   c) micelles   d) dirt particle

3) Physical adsorption is directly proportional to the
   a) pressure   b) temperature   c) volume   d) concentration

4) Foam is a colloidal system in which gas bubbles are dispersed in
   a) gas   b) liquid   c) solid   d) none of these

5) The dispersion medium for the formation of fog is a liquid
   a) True   b) False

6) Which of the following statement is correct regarding chemical adsorption?
   a) it is fast   c) it is reversible
   b) it forms multimolecular layers   d) it has high heat of adsorption

7) The use of membranes for separating impurities from colloidal suspension is
   a) sedimentation   b) ultrasonic   c) dialysis   d) successive cooling

8) Among the Langmuir assumptions is an interaction between the adsorbed molecules on the surface
   a) True   b) False   c) none of these

9) Aggregation methods for preparation of colloids involve
   a) Ultrasonic waves   b) solvent exchange   c) mechanical dispersion   d) Bredig's arc method

10) Adsorption is the a phenomenon in which a substance
   a) remains close to other substance   c) goes into the body of other substance
   b) accumulate on the surface of other substance   d) none of these

Question (2) Mark (√) or (X) as appropriate   (10 marks, 1 for each)

1) The sedimentation rate is affected by medium viscosity.
2) The BET adsorption equation includes the parameters P^0 and ΔH_L.
3) V_m is the volume of gas required for the surface to be fully occupied .
4) The CMC of surfactant solution is directly proportional to the chain length .
5) The surface coverage (Θ) of a solid catalyst is equal to $(1+KP) / KP$.
6) The rod-like micelle is formed below the CMC.
7) The molar conductivity of surfactant solution increases with the concentration up to CMC.
8) The mean displacement of colloidal particles is inversely proportional to the diffusion coefficient.
9) The intercept of the relationship $1/V$ vs $1/P$ of Langmuir isotherm is $1/ bV_m$
10) The tendency for particles to migrate from a region of high concentration to a region of low concentration is controlled by the translation diffusion rate.

باقى الاسئلة فى الخلف

Tanta University - Faculty of Science

Department of Chemistry

FinalExamination for 3rd level students in Transition Elements
Code No.: CH 3147   Major: for all sections
Term: 1st term 2017/2018 Date: Tuesday, 2/1/2018   Period:
10-12 AM   Time allowed: 2 hrs.   Total
assessment: 50 marks

1989

I.Complete the following sentences   (15 marks)

1- IUPAC organization defined transition elements as those elements that..................

2- The size of the d-block elements in a series decreases with increasing the atomic number (from left to right) because of ....

3- The atomic volume of Sc group (group IIIB) increases significantly in   a regular manner from top to down because of...........................   but, in Ti group, the volume increases significantly from Ti to Zr, thenslightly increases from Zr to Hf because of the lanthanide contraction which is defined as.....................

4- Oxidation number is defined as .... For examples the ox. no.'s of the underlined elements in $\underline{Os}O_4$, $\underline{Mn}O_4^-$ are...... and ...., respectively. In the first series of transition elements, the maximum   oxidation number from Sc to Mn is equal to the sum of electrons of ...., but after Mn this number abruptly decreases because of ....

6- The colors of the transition metal compounds may arise from:
(1)....................(2)...........................(3)............   (give examples)

II.Write down onTwoOnly of the following: (9 marks)

a) Zeigler-Natta catalyst for polymerization of ethylene.

a) Kroll's method for extraction of titanium and its uses.

c) Four properties of the lanthanides.

III. Answer the following:(16 marks)

A) In terms of CFT, draw the energy level diagrams of the following ions: a) $Fe^{3+}(d^5)$ in strong and weak octahedral ligand fields. b) $Ni^{2+}(d^8)$ in tetrahedral and square-planar ligand field.

1/2

TANTA UNIVERSITY
FACULTY OF SCIENCE
DEPARTMENT OF CHEMISTRY

EXAMINATION FOR JENIOR (THIRD YEAR) STUDENTS OF BIOCHEMISTRY

COURSE TITLE:	VITAMINS AND INORGANIC CHEMISTRY	COURSE CODE: BC3111
DATE: 4-1-2018	TERM: FIRST	TOTAL ASSESSMENT MARKS: 50	TIME ALLOWED: 2 HOUR

Answer all the questions

I) Correct the under lined word of each of the following: (8 marks)

a. The thyroid gland need **copper** to secret T3 and T4 hormones
b. B6 is excreted in urine as **Oxalic acid**.
c. **Rickets** Is a disease characterized by spongy and sore gums, loose teeth, pale skin and it is due to the deficiency of vitamin **D.**
d. **Osteocalcine** is a conjugated protein present in rods. It contains 11-cis retinal and the protein opsin.
e. **7dehydro cholesterol** is the biologically active form of vitamin D which is formed in **Kidney**
f. **Methyl coblamin** is coenzyme for methyl malonyl coA mutase (storage form)

II) Compare between each of the following: (16 marks)

1. absorption of heme and nonheme iron
2. Water and fat soluble vitamins
3. The role of vitamin B7 and vitamin B2 as coenzymes in lipid metabolism.
4. Retinol and beta caroteines

III) Give an account of the following   (12 marks)

1. The action of calcitirol in elevating plasma calcium.
2. The role of vitamin B12 and folate in DNA synthesis.
3. Vitamin A deficiency.
4. Absorption, Transport and storage of anti coagulant vitamin.

IV) Write the name of the following structures and give short notes about their deficiency   (9 marks)
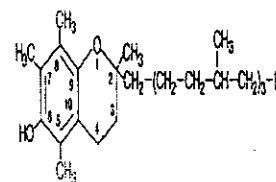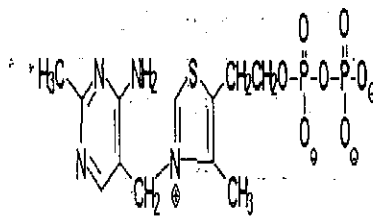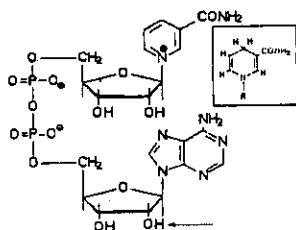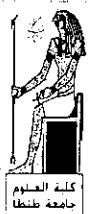

V) The synthesis of δ- amino levulinic acids, the precursor for the heme synthesis is need a vitamin act as coenzyme.   (5 marks)

1. Name the vitamin and its coenzyme.
2. The other biochemical functions of this coenzyme.

FINAL EXAMINATION FOR THIRD YEAR BIOCHEMISTRY STUDENTS

COURSE TITLE:	VITAMINS AND BIOINORGANIC METABOLISM	COURSE CODE: BC3107
DATE: 13-1- 2018	TERM: FIRST TERM	TOTAL ASSESSMENT MARKS: 100	TIME ALLOWED: 2 HOURS

Vitamins (50 marks)

I. Discuss the following questions: (25 Marks)

1. Physiological roles of vitamin B2 and 6.
2. Deficiency of biotin, folic acid, and vitamin B5.
3. Decarboxylation of pyruvate requires complex enzymes and five types of vitamins explain the mechanism.
4. Beri-beri and pellagra diseases.
5. Properties, functions and deficiency of Ascorbic acid.

II. Complete the following sentences: (10 Marks)

1. Vitamin B2 is excreted in urine as .... and ....
2. NAD^+ is the common oxidant in...................while $NADPHH^+$ is the common ....in ....
3. CoA-SH is important in the formation of.................that is enter in.................,...................and...........................
4. Deficiency of folic acid cause..................,......................., and..........................
5. Biotin is important in ....such as...............................and....................................

III. Give the chemical structures of TPP, CoA-SH, Biotin, FMN and NADP. (15 Marks)

Minerals (50 marks)

I- Mention mineral name and causes of the following deficiencies (10 marks)
1. Deficiency of it lead to hypothyroidism
2. deficiency leads to tetany
3. Its deficiency causes hypochromic and microcytic anemia
4. Mineral deficiency leading to defect in ceruloplasmin function
5. Its deficiency lead to Addison's disease

II. Choose the correct answers: (16marks)
1- Hypochromic and microcytic anemia from a deficiency of which mineral
a- Calcium   b- Iron   C-Magnesium   d- Selenium
2-Calcium is controlled by
a- Parathyroid hormone   b- Thyroid hormone   C-calcitriol   d- a and c
3-Phosphate enter the structure of
a- Thyroid hormone   b- Nucleic acid   c-Ceruloplasmin   d- None of them

باقي الأسئلة خلف الورقة

16) In GC, retention depends upon the
A. vapor pressure and polarity of the solute,
B. size and charge of the solute,
C. the method of sample introduction,
D. the type of detector used,
E. type of column used.

17) Which can be used as a mobile phase in HPLC applications?
A. Any compound with non-solubility in liquid,
B. Any compound with solubility in liquid,
C. Any compound with limited solubility in liquid,
D. Any of the above.

18) Total volume refers to the
A. the volume of solvent contained in a liquid chromatographic column,
B. the volume of the column between the point at which solvents are mixed and the beginning of the column.
C. the volume of eluent required to elute a substance so small
D. the volume of eluent required to elute a substance so large

19) Void volume refers to the
A. the volume of eluent required to elute a substance so small
B. the volume of solvent contained in a liquid chromatographic column,
C. the volume of the column between the point at which solvents are mixed and the beginning of the column.
D. the volume of eluent required to elute a substance so large

20) The compound eluted last and retained more in Normal and Reversed phase are
A. Polar and Non-polar,   B. Non- polar and Polar,
C. Both are in Polar   D. Both are in Non- polar
E. None of the above

*************************** **Good luck** ***************************
Examiners: *Prof. Ahmed Rehab; Prof. Ali Abu Saif*

Q ضمـان الجـودة
A كلية العلوم - جامعة طنطا
U QUALITY ASSURANCE UNIT
FACULTY OF SCIENCE - TU

Notes: The question exam in Four pages
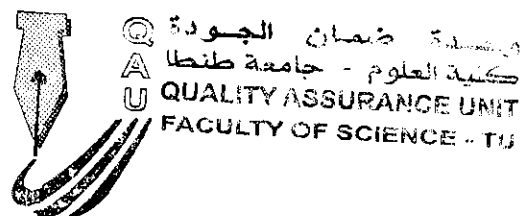
2) Planar chromatography is most correctly characterized by:

A. The mobile phase is a gas or a liquid and the stationary phase is a liquid or a solid.

B. The mobile phase is a liquid and the stationary phase is a liquid or a solid.

C. The mobile phase is a liquid and the stationary phase is a solid.

D. The mobile phase is a liquid and the stationary phase is a liquid.

E. The mobile phase is a gas or a liquid and the sample is a liquid.

3) TLC is generally used as a qualitative analytical technique for

A. determining the number of components in a mixture,

B. checking the purity of a compound,

C. following the course of a reaction,

D. all of the above,   E. none of the above

4) Retention time is defined as

A. The time needed for an individual band of analyte to be eluted.

B. The time needed for all solutes in a sample to be eluted.

C. The time needed after injection for an individual solute to be eluted.

D. The time needed for the carrier gas to be eluted

5) In GC, if two solutes with short retention times co-elute (i.e. are not resolved), what is the simplest way to attempt to resolve the peaks?

A. Use a longer column   B. Use a lower column temperature

C. Use a higher column temperature   D. Use a more polar solvent

6) The factors contributing to band broadening in capillary GC are

A. Effect of mass transfer between phases   B. Joule heating

C. Molecular diffusion   D. Multiple paths of analytes through the column

7) An efficient column is most correctly characterized as a column that can:

A. Separate compounds with short retention times.

B. Separate compounds of large volumes.

C. Produce large amount of results.

D. Separate compounds with very similar properties.

E. Separate compounds with very different properties.

8) The eluent strength is a measure of:

A. Solvent adsorption energy,   C. Solvent diffusivity,

B. Solvent absorption energy,   D. Solvent mixing index.

9) Using TLC, If a particular amino acid has low solubility in the mobile phase used, then the amino acid ...

A. will have a low R_f value.

8-What are σ^+ and σ^- constants and under what circumstances are they employed (give examples). **[10Marks]**.

9- Indicate which of the following is (are) stable, stabilized, destabilized or persistent radicals? (explain your answer)   **[8Marks]**.
a) Isopropyl radical   b) Diphenylpicrylhydrazyl radical.
c) 2,6-Di-tert-butyl-4-methylphenoxy radical
d) Benzylic radical.

10- Arrange the following carbanions according to their stability (1=the most stable): (explain your answer).   **[6Marks]**.
a) $CH_3CH_2^-$ b) FCH_2^- c) $^-C(NO_2)_3$ d) $(CH_3)_3C^-$.

11- Discuss in details the reactions of carbenes. **[10Marks]**.

12- Which statements <u>are</u> correct?   **[6Marks]**.
a)The Hammett reaction constant (ρ) of base-catalyzed hydrolysis of m- and p-substituted ethyl benzoates has +ve value.
b)The Hammett reaction constant (ρ) of base - catalyzed hydrolysis of m- and p-substituted ethyl benzoate has –ve value.
c)The reaction of base -catalyzed hydrolysis of m- and p-substituted ethyl benzoates is retarted by electron-donating substituents.
d)The reaction of base -catalyzed hydrolysis of m- and p-substituted ethyl benzoates is accelerated by electron-donating substituents.

Examiner: Prof. Mahmoud Taha

EXAMINATION FOR (JUNIORS) STUDENTS OF CHEM/BIOCHEM SECTION

COURSE TITLE:	CARBOHYDRATE AND LIPID METABOLISM	COURSE CODE: 3101

DATE: 17-1.2018	JANUARY, 2017	FIRST TERM EXAM	TOTAL ASSESSMENT MARKS: 150	TIME ALLOWED: 2 HOURS

SECTION A   CARBOHYDRATE METABOLISM

Answer the following questions:

I- A-EXPLAIN EACH OF THE FOLLOWING:-   (8 marks each)

i-The simultaneous carrying out of glycolysis and gluconeogenesis is an example of a futile cycle, represented by the following equation: $ATP + H_2O \rightleftharpoons ADP + P_i + heat$

ii- The PDHc reaction occurs in three successive steps that are catalyzed by three different subunits (E_1-E_3).

iii-At the conclusion of the reactions of non-oxidative HMPS, three molecules of ribulose-5-phosphate have been converted to two molecules of fructose-6-phosphate and one molecule of glyceraldehyde-3-phosphate.

iv- Glycogen is synthesized when glucose supply is high, and its degradation helps to maintain the blood glucose level when we are fasting.

II- CLARIFY EACH OF THE FOLLOWING:-   (7 marks each)

i The passage of both the glucose and the galactose, is mediated by SGLT1, Fructose, enters into the cells by facilitated diffusion, also called passive transport

ii- In the liver fructokinase requires the function of additional enzymes to utilize the trace of fructose found in food.

iii- Regulation of PDH by allosteric effectors and by phosphorylation

III- CHOOSE THE CORRECT ANSWER (S).   (3 marks each)

i-Ethanolic fermentation in yeast serves a dual purpose through formation of :-
a-NADH   b- NAD+   c-ethanol   d- pyruvate

ii-Energy-rich substrate (s) of glycolysis is (are)
a- PEP   b-DHAP   c-1,3-bisphosphoglycerate   d- glyceraldehyde-3P

iii- Ethanol degradation inhibits gluconeogenesis through the formation of
a- Acetaldehyde   b-acetate   c- acetyl CoA   d- NAD+

iv-The basic idea of the TCA cycle consists in releasing substrates carbon as
a- citrate   b- isocitrate   c-CO_2 d-oxaloacetate

v- The oxidative phase of HMPS, in which glucose-6-P is oxidized and decarboxylated to
a- ribulose-5-P   b-fructose-6-P   c-Ribose 5-P   d-Xylose 5-P S

PROF. Dr. AHMED SAAFAN