جامعة المنصورة – كلية العلوم
قسم الرياضيات
التاريخ : ١٨ / ٦ / ٢٠١٢ م
الدرجة الكلية : ٨٠ درجة
الزمن : ساعتان

امتحان دور مايو ٢٠١٢
برنامج : كيمياء حيوى + كيمياء
المستوى: الثالث
اسم المقرر : احصاء حيوى
كود المادة : ر ٣٠١

Answer the following questions:

[1] a) Certain tubes manufactured by a company have a mean lifetime $\mu = 800$ hours and a standard deviation of $\sigma = 48$ hours. Find the probability that a random sample of size 36 tubes taken from the group will have a mean lifetime

i) Between 784 and 810 hours **ii) More than 812 hours** **(10 Marks)**

b) Let X be a binomial random variable with parameters $n = 4$ and $p = 0.3$

Find i) $P(X > 1)$ **ii) $P(X = 2)$** **(10 Marks)**

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[2]a) In a certain population , suppose that the number of deaths per year from cancer has a Poisson distribution with average 3 Find the probability that in a year there are

i) Exactly 4 deaths **ii) Less than two deaths** **(10 Marks)**

b) A random sample of size 36 has mean $\overline{X} = 2.6$ and standard deviation $S = 0.3$

Find the 95 % confidence interval for μ **(10 Marks)**

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[3] a) Let X be a random variable with the density function

$$f(x) = \begin{cases} k\,x(3-x) & , \quad 0 \le x \le 3 \\ 0 & , \quad \text{elsewhere} \end{cases}$$

Find i) The value of the constant k **ii) The mean μ** **(10 Marks)**

b) Consider the following frequency dist. of the ages (in years) of 20 cancer patients

Age	5.5 – 10.5	10.5 – 15.5	15.5 – 20.5	20.5 – 25.5	25.5 – 30.5	30.5 – 35.5
frequency	1	2	4	5	5	3

Find i) The sample mean **ii) The sample variance**

iii) The coefficient of variation **(24 Marks)**

c) Find the sample median of the following data :

3 , 6 , 1 , 9 , 8 , 11 , 10 , 4 **(6 Marks)**

$Z_{0.025} = 1.96$, $\Phi(-2) = 0.0228$, $\Phi(1.25) = 0.8944$, $\Phi(1.5) = 0.9332$

مع أطيب التمنيات بالنجاح د. مجدى برسوم – د. فاتن شيحه

المستوى الثالث - كيمياء حيوية - كيمياء عضوية كيمياء (٣٢٦ ك)
كيمياء ورياك
كيمياء بصرات

Mansoura University
Faculty of Science
Chemistry Dept.
3rd Year Gen. Chem.

2d Semester 2012
Chem. 364
Full Mark **[80]**
Time Allowed 2hr

Final Examination

Answer the Following Questions:

1)(a) Which conditions can increase the rate of chemical reactions?[4]

(b) Explain what do you understand by the terms? i- activation energy, ii- steady-state approximation and iii- active collisions of molecules. [6]

(c) What are the consequences of Light Absorption? [5]

2) Compare between three ONLY of the following: [15]

(a) Fluorescence and phosphorescence and give only two applications for each.

(b) Half-life time for zero and first order

(c) The value of [B] for parallel and consecutive reactions.

(d) Rate equation for the reactions;

$$A \xrightarrow{k_1} B \quad , \quad A \underset{k_2}{\overset{k_1}{\rightleftharpoons}} B$$

3) Deduce the equations used for calculating the order of reaction using the initial rate and half-life time methods. [10]

4) A first order reaction 30 %of its initial concentration was consumed in 20 minutes. Calculate the half- life time and the rate constant of this reaction. [10]

5) For the photochemical reaction; A→ B , $1x10^{-5}$ M of B is formed on absorption of 6.60 J at 3600 Å. Calculate the quantum yield. Comment on the result. [15]

6) Given the following data for the reaction, A + B → Products,

[A](mol L^{-1})	[B](mol L^{-1})	Rate (mol $L^{-1}s^{-1}$)
$1.0x10^{-4}$	$1.0 x10^{-4}$	$1.23 x10^{-6}$
$1.0 x10^{-4}$	$2.0 x10^{-4}$	$2.46 x10^{-6}$
$2.0 x10^{-4}$	$1.0 x10^{-4}$	$4.92 x10^{-6}$

Calculate the order and rate constant, of the reaction.[15]

Good Luck Prof. Shawky Hassan, Prof. MOH. Emam Dr. Maani Hamada

٣ كيمياء حيوية - كيمياء تخليقية ت(٢٣٨)

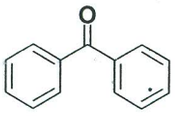
Second term Examination ***May 2012***

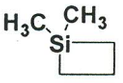
Subject:- Organometallic Chemistry& Organic Synthesis
Time Allowed: 2 hrs
Date:- 11 / 6 / 2012 338

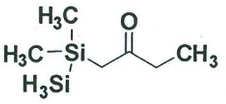
Mansoura University, Faculty of science, Chemistry Department
Third level Biochemistry Students
Fullmark:-80

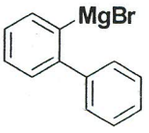
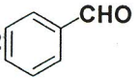
Answer ALL Questions

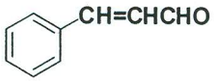
1- Complete the equations and write mechanisms that account for the products formed in each of the reactions (28points):-

1)  + Mg / MgI_2 ⟶

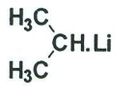
2)  heat ⟶

3)  + C_2H_5OH ⟶

4)  + 2  ⟶

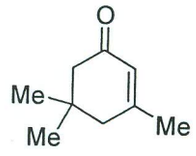
5)  + C_2H_5OMgCl ⟶

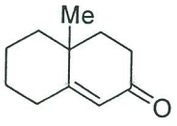
6) $(CH_3)_3Si.CH_2.Cl$ + $AgNO_3$ ⟶

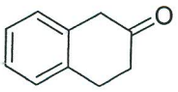
7)  + CO_2 ⟶

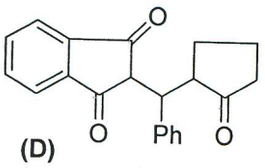
2- Discuss the chemical structure of ferrocene and its chemical reactions with varies diazonium compounds & its nitration, halogenations, sulfonation (12points):-

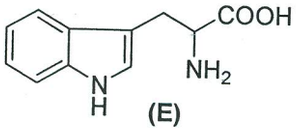
3) Suggest a synthesis for each of the following compounds: [15 Marks]


(A)


(B)


(C)


(D)


(E)

4) Explain by chemical equations each of the following: [20 Marks]
a) Synthesis of Cocaine.
b) Synthetic applications of Michael reaction.
c) Synthesis of heteroauxin.

د. سها مصطفى م.د. سعد المرسى

٣ كيمياء عضوية - كيمياء منتجات طبيعية ك ٣٣٥

Mansoura University
Faculty of Science
Chemistry Department
Mansoura, Egypt

جامعة المنصورة
كلية العلوم
قسم الكيمياء
المنصورة – مصر

Second Semester Jun 2012

Educational Year: 3ed Year Chemistry & General.
Course (s): Natural Products.
Date: 11/06/2012.
Course Code: CH 335.

Subject: Chemistry.
Full Mark: 60.
Time: 2 hrs.

Answer the following questions

1 – a) Explain how α-terpineol is biosynthesized from acetyl-Co A. (10 marks)

b) Write the chemical structure of the following compounds and their classification (5 marks)

1- α-ionone
2- Limonene
3- Nerol
4- Ergosterol
5- Pregn-4-en-3, 20-dione
6- Ephedrine
7- Nicotine
8- Heroin
9- Morphine
10- Ephedrine

2 - Provide the chrmical reactions, which elucidate the chemical structure of ergosterol and how ergosterol is converted to vitamine D_2? explain your answer by chemical equations. (15 marks)

3 - Illustrate by chemical equations the conversion of the following: (15 marks)

a) Dehydroepiondrosterone into testosterol.

b) 2-(1-naphthyl)-ethyl magnesium bromide into diel´s hydrocarbon

c) 3-cyano pyridine into nicotine.

4 – Clearly show the structure elucidation of the following: (15 marks)

a) Myrcene

b) Geraniol

Prof. Dr. MM Abou-Elzahab, Prof. Dr. M Berghot & Dr. M Elsayed

المستوى الثالث - كيمياء حيوية - التحليل الوزن، طرق - الكورس لـ ٣١٣

Mansoura University **Faculty of Science** **Chemistry Department** **Subject: Analytical Chemistry** **Course(s): 313- Chem. Biochemistry**	كلية العلوم جامعة المنصورة	**Second Term** **Third Year Biochemistry Students** **Time Allowed: 2 hours** **Full Mark: Marks** **Date: June 2012**

Answer the following questions

1-A- Rationalize the following sentences: **(10 Marks)**

i- During carrying out the polarogram of Cd^{2+}, N_2 gas should be passed through the solution for 10 min before and not during the reduction process.
ii- Supporting electrolyte e.g. KCl should be added during the reduction of Cd^{2+} ions.
iii- Gelatin of practical concentration 0.005 % should be present during the electrolysis of Cu^{2+} ions deposited at the DME.
iv- Polarography can be used for the quantitative determination of Zn^{2+} ions.
v- Half-wave potential $E_{1/2}$ is consider as finger print for the qualitative identification of all metal ions explain with reference to the equation of the polarographic wave.

1-B- The organic phenol is easily brominated by the following equation:

$$C_6H_5OH + 3Br_2 \longrightarrow C_6H_2Br_3OH + 3\,HBr$$

This equation forms the basis for a coulometric titration with electrogenerated bromine. A 200 ml sample of polluted H_2O is acidified and 5 gm of KBr is added. The coulometric titration requires 6.033 min at 0.0286 A to reach the amperometric end point. Calculate the phenol content in the samples as part per million (μg/ml). Show whether the given water sample of water is polluted by phenol or not (if C_{phenol} is greater than 1 ppm , the water is polluted). At.Wts: C = 12, O = 16, H = 1.008 . **(5 Marks)**

2-A- Write an account about the indicator electrode of the 3rd type with reference to the half-cell electrode reaction, the electrode potential , the calibration curve and how it can be used for the determination of $[Ca^{2+}]$ ions in hard water sample. **(7 Marks)**

2-B-i- Calculate the pH and $[H^+]$ for the weak organic acid solution (HAc) present in the anode chamber for the following cell:

(+) Pt / H_2 (0.255 atm) / HAc (1.3479,M) // KCl (sat'd) / $Hg_2Cl_{2(s)}$ / Hg (-)

Knowing that E_{cell} = 0.3625 volt, $E_{calomel}$ = 0.244 volt, $E^o_{2H^+/H_2}$ = 0.0 v.

2-B-ii- Calculate the dissociation constant , K_a for the weak organic acid , HAc, occur the anode chamber at 25 °C. 50 ml of the weak acid in anode chamber was titrated versus NaOH solution using glass electrode , 5 ml of NaOH solution was required .Calculate C_{NaOH} in ppm. At.Wts: Na = 23 , O = 15 and H = 1.008. **(8 Marks)**

Please Turn Over ⟶

3- A- Define each of the following:
(i) Activity coefficient (ii) Peptization (iii) Filtration **(9 Marks)**

3- B- Determine the purity of a sample of the binary mixture " Calcium oxalate mono hydrate and magnesium oxalate dehydrate" dried at 100°C from the following knowledge :
(6 Marks)
i- The weight of sample is **500 mg** (initial weight).
ii- The loss in weight in the TG curve are :
-In the temperature range **100- 250 °C** , the loss in weight is **72 mg.**
-In the temperature range **400- 500 °C** , the loss in weight is **128 mg.**
-In the temperature range **650- 850 °C** , the loss in weight is **88 mg.**
-The mechanism of decomposition of $CaC_2O_4.H_2O$.

4-A- Write briefly on only **Two** of the following: **(10 Marks)**
(i) Coprecipitation (ii) Effect of temperature (iii) Salt effect on precipitate

4-B-You are provided with 1 liter of saturated solution containing **0.533 g** of $MgCO_3$ at 20°C .
- Calculate the solubility in ppm and the solubility product of $MgCO_3$. **(5 Marks)**
- At.Wts: Mg = 24.31, C = 12 , O = 16, Ca = 40, H = 1.008 .

Good Luck ***Prof- M. Hafez and Yasmin Gaber***

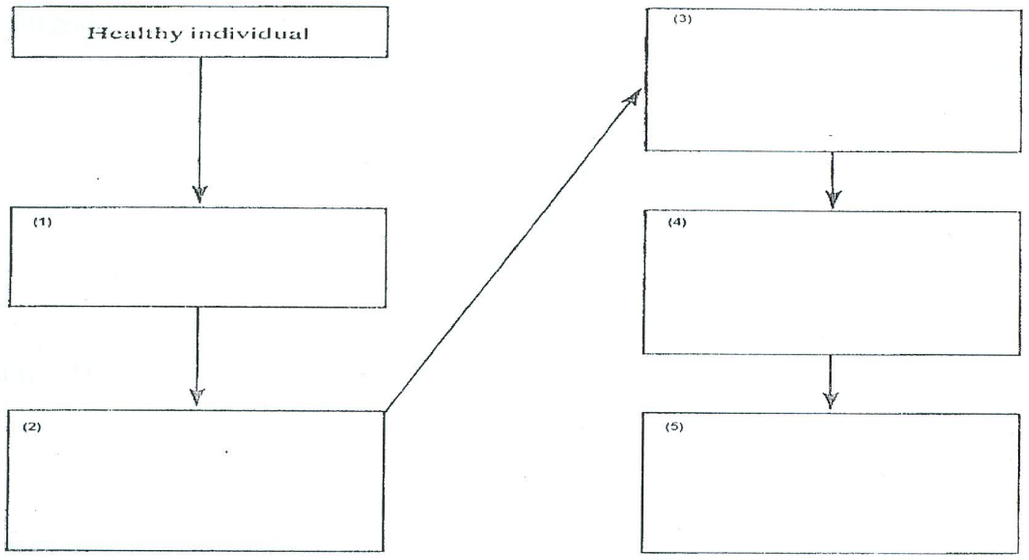
٣ فيزياء حيوية - كيمياء حيوية إكلينيكية (ك ٣٧٨)

Mansoura University
Faculty of Science
Chemistry Department
Subject: Biochem. 378
Course(s): Clinical Biochemistry

Second Term
Final Exam
Third Level (Biophysics)
Date: 11th June 2012
Time Allowed: Two hours
Full Mark: 80 Marks

Answer ALL the Following Questions

[1] A- Fill in the blank boxes in the following diagram showing the progressive development of a disease process:



[15] Marks

B- Discuss the factors affecting the individual that need to be considered in establishing reference values. **[14] Marks**

[2] A- Because of some difficulties in practice, all chemical methods of testing for faecal occult blood give rise to both false and positive results. **Comment!**

[6] Marks

B- Mention the causes of water depletion and provide some examples for each cause.

[7] Marks

C- Explain the mechanisms and causes of metabolic acidosis. **[10] Marks**

[3] A- Enumerate the factors known to cause a shift of HbO_2 dissociation curve to the right.

[6] Marks

P.T.O

B- A young man was trapped underneath a car in a road traffic accident, and suffered multiple fractures. Despite adequate fluid intake over the next 36 h, at the time he was noted to be oliguric. The following results were obtained:

	Plasma analyses	**Reference range**
[Urea] (mmol/L)	22.1	2.5-6.6
[Na^+] (mmol/L)	133	132-144
[K^+] (mmol/L)	6.1	3.3-4.7
[Creatinine] (µmol/L)	214	55-120

Why is the potassium high? **[10] Marks**

C- How can chemical investigation of patients with renal stones be helpful in reaching a diagnosis?

[12] Marks

Examiner: Dr. Ahmed EL-Sokkary

-Good Luck-

٣ كيمياء حيوية - التكنولوجيا الحيوية وتطبيقاتها (٢٧٦ بح)

Mansoura University Faculty of Science Chemistry Department Biochemistry Program		جامعة المنصورة كلية العلوم قسم الكيمياء برنامج الكيمياء الحيويه

Final Examination
Second Term: May 2012

Educational Year: Third Level		Program (Branch): Biochemistry	
Subject: Biochem 376		Course(s): Biotechnology and Its Applications	
Time: 2 hrs	Date: 14 /06 /2012	Full mark: 60	Question mark: 16-24

Answer the following questions:

Q-1 **Choose the correct answer(s) :**

25 points

1- Benefits of biotechnology are numerous just to mention:
A- Increased production of goods and services
B- Made labor easier, safer and reduces the amount of labor needed.
C- Increased productivity and increases the standard of living
D- Accomplish the fantasy of savvy scientists

2- Scientists want to develop a super bacterium capable of polycarbonated biphenyls, they need Except:
a- plasmid b- restriction enzymes c- T4 DNA ligase d- introduction into bacterial host e-the *Alcaliegenes* and *Nocardiopsis* f- selection for marker gene g- source of the gene

3- During fermentation process gene of producing organisms are regulation at several levels; which one is the correct order:
a- Initiation, transcription, post-transcription processing, mRNA degradation, protein synthesis, post-translation processing, protein degradation.
b- Transcription, post-transcription, mRNA degradation, initiation of protein synthesis, post-translation processing, protein degradation.
c- Transcription, mRNA processing, post-transcription processing, intitiation of protein synthesis, post-translation processing, protein degradation.

4- The nucleotide sequence and location of Pribnow are:
a- TATCGA at – 10 position of bacterial gene b- TATAAT at – 10 position of bacterial gene c- TATAA at – 35 position of bacterial gene d- TATAAA at – 25 position of animal gene

5- Primary metabolite are formed in parallel with growth of bacteria
a- are ESSENTIALS for life and reproduction of cell.
b- are NOT ESSENTIAL for growth and reproduction of a cell.
c- are formed after growth and reproduction have occurred
d- their formation is extremely dependent on environmental conditions.

6- The one unit substrate carbon Flow during Aerobic Degradation in an Activated Sludge System can be calculated under:
a) Saturating conditions: it produces 0.6 unit CO_2 carbon +0.4 unit cell carbon.
b) Limiting Substrate Supply: it produces 0.7 unit CO_2 carbon +0.3 unit cell carbon.
c) Anaerobic Degradation: it produces 0.85 unit CO_2 carbon+ 0.15 unit cell carbon
d) All are correct e) all are wrong

7- fermentation variables that may be controlled to optimize protein yield include: a) media composition, pH, nutrient composition and supplement feed rate,
b) temperature, inducer concentration, dissolved oxygen concentration, induction time, and harvest time.

c) equipment preparation and sterilization, batch or fed-batch fermentation.

8- A Chemostate is a device for Except:
a) the continuous culture of bacteria. b) no synchronization of bacterial population c- it relieves the environmental conditions that restricts growth, d- it continuously supply nutrients to cells and removing waste substances.
9- The objectives of studying the metabolic flux is:
a) determine the rate of substrate conversion into product
b) determine the concentration of the fermentation end product
c) determine the rate limiting reaction
d) determine the gene dosage of the metabolic pathway.
10- Complete: An Interdisciplinary combining activities of TEAM WORK is necessary for successful fermentation where: Microbiologist job is ……..,……., ……., ……., -------, and ---------. The Chemististconcerned about ---------, and ----------
The Biochemistist will do----------. The Engineer---------- and the Bibliographics ----------.

Q- 2

25 points

1. Biotechnology uses substances from living organisms to make or modify a product, to improve microbe, plants or animals for specific use.
2. The genetic information is found in nucleoid of the prokaryotic cells, whereas eukaryotic cells having it in the nucleus.
3. A good number of microorganisms have been specifically developed to be used in biological removal of organic and toxic materials before being disposed into natural water bodies.
4. Dimers formed between adjacent thymidine residues along DNA strand due to exposure to X-ray radiation.
5. Inducible genes are continually transcribed to produces constant level of specific proteins.
6. Commercially important antibiotics are produced by fungi (*Penicillium)* or bacteria (*Streptomyces* and *Bacillus)*.
7. Poly-β-hydroxyalkonate (PHA) is synthesized by bacteria and can be degraded by other microorganisms.
8. The overall reaction of transesterification is made from the combination of a triglyceride with a monohydroxy butanol to produce biodiesel.
9. Metabolic reactions occurring within a biological waste water treatment process can be divided into: oxidation, synthesis and endogenous respiration.
10. The efficiency of mass and energy balance for anaerobic glucose degradation and sewage sludge stabilization are 9 g and 6.9% with 4.6% as dissipated heat..

Q- 3

30 points

Fermentor is the master piece of the fermentation process and at the end of the process several steps are required to obtain the end product. Explain the statement and answer the following:

A. What type of organisms is preferred to use in the fermentation process?
B. What are the different parameters you need to control during the running of the process? and how you do it?
C. How to obtain the final product in a pure form?

Examiners:	**Prof. Dr.** ***Yehia Abdel-Moneim Osman Ellazeik***
	Best Wishes

٣ كيمياء حيوية - الأكاديمية النوعية بالدراسات (لا ٢٠١٢)

Mansoura University
Faculty of Science
Chemistry Department
Biochemistry Program

جامعة المنصورة
كلية العلوم
قسم الكيمياء
برنامج الكيمياء الحيويه

Final Examination
Second Term: May 2012

Educational Year: Third Level		**Program (Branch): Biochemistry**	
Subject: Biochem 375	**Course(s): Nucleic Acids as Genetic Materials**		
Time: 2 hrs	**Date: 04 /06 /2012**	**Full mark: 80**	**Question mark: 20- 30**

Answer the following questions:

Q-1 **Choose the correct answer(s) :**

25 points

1. Three types of RNA involved in comprising the structural and functional core for protein synthesis, serving as a template for translation, and transporting amino acid, respectively, the correct arrangement is:

A . mRNA, tRNA, rRNA B. rRNA, tRNA, mRNA C. tRNA, mRNA, rRNA
D. tRNA, rRNA, mRNA E. rRNA, mRNA ,tRNA

2. A messenger acid is 336 nucleotides long, including the initiator and termination codons. The number of amino acids in the protein translated from this mRNA is (explain what happened?):

A. 999 B. 630 C. 330 D. 111

3- Which of the following mutations usually result in a nil phenotype and why?

A. nonsense B. frameshift C. deletion D. insertion E. missense

4- Each Operon is consisted of few

A. structural genes B. structural cistrons C. some cis-acting element such as promoter and operator. D. trans-acting genetic factors such as repressor or activators.

5- Mendel noticed the following when he true-bred hybrid plants:

A. the recessive trait would reappear in 25% of the F2 generation.
B. can use this probability to determine the results of genetic crosses
C. Alleles for different genes usually segregate dependently of each other
D. Many traits are determined through the interactions of multiple genes

6- The role of ribosome in translation is:

a. Similar to its role in transcription b. recognizes the anticodon on the mRNA
c. dependent on the separate large and small subunits
d. assemble around the mRNA to form translation initiation complex.

7- The central dogma is basically the same in both Eukaryotic and Prokaryotic organisms, Except:

A. It is completed in the cytoplasm of Eukaryotic cell
B. It is completed in the nucleus of the Eukaryotic cell
C. The Eukaryotic cell produces pre-mRNA which matures in the cytoplasm
D. Transcription and translation is coupled in cytoplasm of the Prokaryotic cell

8- Glucose affects the catabolic repressor protein (CRP) action on several operons:

A. If glucose is present, CRP is activated, and the synthesis of enzymes that catabolize other compounds is slowed.
B. If glucose is present it reduces the cAMP which in turn inactivates CRP and the synthesis of enzymes that catabolize other compounds is slowed.
C. If glucose is low, CRP is inactive, and the synthesis of enzymes that catabolize other compounds is increased.
D. If glucose is low cAMP is high, CRP is active, and the synthesis of enzymes that catabolize other compounds is increased.

9- Transcription of a gene into mRNA include:

A. Processing B. Splicing and editing C. modification of RNA into functional mRNA D. All of the above E. None of the above

10- Degeneracy of the genetic codon means:

A. All amino acids are encoded by multiple codons
B. Is found only in the third position of the codon
C. It can be changed without change in the amino acid it codes.
D. Regardless of codon used, the first amino acid incorporated will be formyl-methionine.

Q- 2 **Answer by either T or F (correct the F)**

25 points

1. The fact that DNA is genetic material came from the experiments using bacteria and viruses.
2. In 1960s, the genetic code was established to be 'universal' for all living organisms. However, from late 1970s, variations of genetic code have been found in various genetic systems. Variations of genetic code promote studies on the origin and evolution of the genetic code.
3. Central dogma states that genetic information flows bidirectionally from DNA to protein via RNA as an intermediary.
4. All tRNAs conform to a secondary structure described as a 'cloverleaf', and fold in three-dimensional space into an 'L-shaped' molecule, in which the amino acid and the anticodon are at opposite ends of the molecule.
5. Wobble base pairing between anticodon first position and codon third position is an important constraint for codon reassignment.
6. A nonsense mutation occurs when a codon that codes for an amino acid is changed to a chain-termination codon.
7. In protein synthesis, succeeding amino acids are indicated by a sequence of codons in the gene. A given amino acid may be represented by up to six codons, making a choice between synonymous codons possible; this permits the creation of an evolutionary pattern of codon usages.
8. All organisms exhibit preferred 'codon bias', in which certain synonymous codons are preferred over others, generally corresponding to cognate tRNA abundance.
9. Universal genetic code shows the way of assignment of 64 triplet codons to each of 20 amino acids and 3 termination codons, which is common to almost all extant organisms – bacteria, yeasts, viruses, plants and animals.
10. Mutagenesis with UV light causes a variety of types of mutations, but the mutagen ICR181 specifically causes frameshift mutations.

Q- 3

30 points

A- Which scientists first gave experimental evidence that DNA is the genetic material? And what was their landmark experiment?

B- Briefly mention **the levels** at which regulation of eukaryotic gene expression takes place.

C- Lac Operon is an inducible one, what is the enzymatic reaction necessary to produce the inducer molecule for this operon?

Examiners:	**Prof. Dr.** ***Yehia Abdel-Moneim Osman Ellazeik***
	Best Wishes

٣ كيمياء حيوية - الأكاديمية النوعية بالدراسات (لا ٢٠١٢)

Mansoura University
Faculty of Science
Chemistry Department
Biochemistry Program

جامعة المنصورة
كلية العلوم
قسم الكيمياء
برنامج الكيمياء الحيويه

Final Examination
Second Term: May 2012

Educational Year: Third Level		**Program (Branch): Biochemistry**	
Subject: Biochem 375	**Course(s): Nucleic Acids as Genetic Materials**		
Time: 2 hrs	**Date: 04 /06 /2012**	**Full mark: 80**	**Question mark: 20- 30**

Answer the following questions:

Q-1 **Choose the correct answer(s) :**

25 points

1. Three types of RNA involved in comprising the structural and functional core for protein synthesis, serving as a template for translation, and transporting amino acid, respectively, the correct arrangement is:

A . mRNA, tRNA, rRNA B. rRNA, tRNA, mRNA C. tRNA, mRNA, rRNA
D. tRNA, rRNA, mRNA E. rRNA, mRNA ,tRNA

2. A messenger acid is 336 nucleotides long, including the initiator and termination codons. The number of amino acids in the protein translated from this mRNA is (explain what happened?):

A. 999 B. 630 C. 330 D. 111

3- Which of the following mutations usually result in a nil phenotype and why?

A. nonsense B. frameshift C. deletion D. insertion E. missense

4- Each Operon is consisted of few

A. structural genes B. structural cistrons C. some cis-acting element such as promoter and operator. D. trans-acting genetic factors such as repressor or activators.

5- Mendel noticed the following when he true-bred hybrid plants:

A. the recessive trait would reappear in 25% of the F2 generation.
B. can use this probability to determine the results of genetic crosses
C. Alleles for different genes usually segregate dependently of each other
D. Many traits are determined through the interactions of multiple genes

6- The role of ribosome in translation is:

a. Similar to its role in transcription b. recognizes the anticodon on the mRNA
c. dependent on the separate large and small subunits
d. assemble around the mRNA to form translation initiation complex.

7- The central dogma is basically the same in both Eukaryotic and Prokaryotic organisms, Except:

A. It is completed in the cytoplasm of Eukaryotic cell
B. It is completed in the nucleus of the Eukaryotic cell
C. The Eukaryotic cell produces pre-mRNA which matures in the cytoplasm
D. Transcription and translation is coupled in cytoplasm of the Prokaryotic cell

8- Glucose affects the catabolic repressor protein (CRP) action on several operons:

A. If glucose is present, CRP is activated, and the synthesis of enzymes that catabolize other compounds is slowed.
B. If glucose is present it reduces the cAMP which in turn inactivates CRP and the synthesis of enzymes that catabolize other compounds is slowed.
C. If glucose is low, CRP is inactive, and the synthesis of enzymes that catabolize other compounds is increased.
D. If glucose is low cAMP is high, CRP is active, and the synthesis of enzymes that catabolize other compounds is increased.

9- Transcription of a gene into mRNA include:

A. Processing B. Splicing and editing C. modification of RNA into functional mRNA D. All of the above E. None of the above

10- Degeneracy of the genetic codon means:

A. All amino acids are encoded by multiple codons
B. Is found only in the third position of the codon
C. It can be changed without change in the amino acid it codes.
D. Regardless of codon used, the first amino acid incorporated will be formyl-methionine.

Q- 2 **Answer by either T or F (correct the F)**

25 points

1. The fact that DNA is genetic material came from the experiments using bacteria and viruses.
2. In 1960s, the genetic code was established to be 'universal' for all living organisms. However, from late 1970s, variations of genetic code have been found in various genetic systems. Variations of genetic code promote studies on the origin and evolution of the genetic code.
3. Central dogma states that genetic information flows bidirectionally from DNA to protein via RNA as an intermediary.
4. All tRNAs conform to a secondary structure described as a 'cloverleaf', and fold in three-dimensional space into an 'L-shaped' molecule, in which the amino acid and the anticodon are at opposite ends of the molecule.
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