المستوى الرابع - كيمياء - كيمياء حيوية - كيمياء حيوانية - كيمياء نبات ٢٠١٣
كلية علوم

Mansoura University
Faculty of Science
Chemistry Department
Subject: Analytical Chemistry
Course Environmental Chemistry
Course code: CHEM 413.....

4thlevel(Chemistry,Botany and Biology students)
Date:**25-5-2013**
Time allowed: **2** hours
Full Mark:80 Marks

Answer the Following Questions:

1- Explain, with examples, the effect of toxic chemicals on enzymes. . (10marks)

2- Discuss the mechanism of action of insecticide (10 marks)

3- What is pollutant cycle? Illustrate such a cycle in the environment (10 marks)

4. Write short notes on **three** only of the following : (15 marks)

(a) Sanitary landfill method for waste disposal

(b) Incineration method of waste disposal

(c) Municipal waste composting

(d) The toxic effects of CO in the body. Is this effect reversible or irreversible? Does it act on enzyme system?

5- Define the following :

a) Heavy metals b) Chemical speciation c) BOD and DO

(15marks)

Best wishes,

Dr.I. Kenawy , Dr. M. Eldefrawy and Dr Weam Abo-Elmaty

Mansoura University
Faculty of Science
Chemistry Department
Subject: Polymer & Environmental Chemist

First Term
4th Year: General Student
Date: May 2013
Time allowed: 2 h
Total Marks: 60 marks

Answer the following questions:

1- Compare between each of the following: (15 marks)

a - Thermoplastic and Thermoset polymers.
b- Alternating, Graft and Block copolymers.
c- Isotactic, Syndiotactic and Atactic polymers.
d- Chain-growth and Step-growth polymerization.
e- Linear, Branched, Network, Star and Dendrimers polymers.

2- Write short notes on the different types of initiators generally used in free radical Polymerization. Then select one of them suitable for illustrating the mechanism of polymerization of *styrene* monomer. (15 marks)

3- a) In polymerization of phthalic and ethylene glycol, although we get 80% degree of conversion we didn't obtain a polymeric material. Explain. (8 marks).

b) Derive a mathematical expression for the kinetics of free radical polymerization (7 marks).

4- a) Compare between cellulose, chitin and chitosan (7 marks).

b) By chemical equations, illustrate how to prepare polyvinyl alcohol and polyvinyl amine. (8 marks).

With our best Wishes

Examiners:

Dr. Dalia Mokhtar Ayad and Dr. M. Monier

المستوى الرابع - كيمياء حيوى - ٤٧٦ ٤٧٦ الثمرات

Mansoura University
Faculty of Science
Chemistry Department
Subject: Biochem. 476
Course(s): Biochemistry of Industrial Fermentation

Second Term
Final Exam
Fourth Level (Biochemistry)
Date: 11th June 2013
Time Allowed: Two hours
Full Mark: 60 Marks

Note: Express your answer by formulae, equations, pathways, figures or tables wherever possible

Answer ALL the Following Questions

1- a) Give an account on the biochemical pathway and production of ethyl alcohol by fermentation of molasses [15] Marks

b) What are the other fermentation products? Describe their uses as well as those of ethanol.

[10] Marks

2- Discuss the biosynthesis and production of acetic acid (vinegar) by fermentation. Draw the fermentation equipment used in its production.

[17.5] Marks

3- Show how the amino acid lysine is biosynthesized via the aminoadipic acid pathway. What is the importance of its production?

[17.5] Marks

-Good Luck-

Examiner: Prof. Dr. Hussein Ghaleb Osman

المستوى الرابع - كيمياء حيوية - كيمياء السطوح والحفز 222

Mansoura University **Faculty of Science** **Chemistry Department** **Subject: Chemistry 444** **Course(s): Surface chemistry and catalysis**		**Second Term examination** **Fourth level biochemistry Students** **Time Allowed: 3 hours** **Time: 2 hours** **Date: 8/6/2013**

1- Answer the following

a) Observations show that often acids or bases can act as catalysts. In some cases the rate depends on the nature of the acid or base (specific acid-base catalysis) and in other cases it does not depend on the nature of the acid or base. Discuss this statement considering the following equation:

S $\xrightarrow[HA,\ A^-]{H^+,\ OH^-}$ P, where S is the substrate. (10marks).

b) What are the green chemistry and the role of heterogeneous catalysis in this respect? (4marks).

c) An enzyme catalyzed reaction exhibits a rate of 220 μmol/min at a substrate concentration of 28 mM. The V_{max} is 250 μmol/min. What is the rate when [S] = 5 mM ? (4marks).

d) Explain the following kinetic rate equations?

(i) rate = $k\, b_{H2}\, P_{H2}/b_{C2H4}\, P_{C2H4}$ (hydrogenation of C_2H_4). (3marks).

(ii) rate = $kb_{N2O}P_{N2O}/b_{O2}P_{O2}$ (decomposition of N_2O). (3marks).

(iii) rate = $kb_{CO}P_{CO}P_{O2}/\ b_{O2}P_{O2}$ (oxidation of CO) - Drive the rate equation.(6 marks)

2- Answer the following

a) Why water rises to different heights in capillaries of different bores? (2 marks)

b) Why water wets glass? (2 marks)

c) Classify the adsorption process. (3 marks)

d)What are the applications of adsorption process? (4 marks)

e) Explain two methods for the determination of surface tension. (4 marks)

3- Answer the following

a) What is the parachor? Give two examples form their applications.(5 marks)

b) Calculate the diameter of a capillary tube in which mercury is depressed by 1.219×10^{-2} m. Given: surface tension of mercury is 0.54 N m^{-1} angle of contact is 140° and density of mercury is 13600 kg m^{-3}. (3marks).

c) Derive Langmuir adsorption equation. (5 marks)

d) Differentiate between Freundlich and Langmuir isotherms. (2 marks)

Prof. Awad I. Ahmed

Mansoura University
Faculty of Science
Chemistry Department
Subject: Biochemistry
Course: Cancer Biology, Biochemistry 478

Second Term Examination
4rd Level Students
Date June 1, 2013
Time Allowed: Two hours
Full Marks: 80 Marks

Answer the following questions:

Q1. Compare between each of the following: **(20 Marks, 5 marks for each)**

a. . Benign and malignant tumors.
b. Ultimate- and pro-carcinogen.
c. Oncogene and tumor suppressor gene.
d. Apoptosis and necrosis.

Q2. (25 Marks)

a. The p53 gene has been called "the most frequently mutated gene in human cancer", or "the guardian of the genome". It is commonly believed that p53 senses damage to the cell's DNA, and that, in some way, this "activates" p53. What are the 2 possible outcomes of p53 activation? **(15 Marks)**

b. What is the mechanism of action of target cell death cancer gene therapy? Illustrate your answer with graph. **(10 Marks)**

Q3. Write short notes on: **20 Marks, 5 marks for each)**

i. Wnt pathway
ii. Angiogenesis
iii. Philadelphia chromosome
iv. .Hormone antagonists as antitumor drugs.

Q4. (15 Marks, 5 for each)

a. How can retrovirus contribute to cancer?
b. Explain the role of BRCA1 and BRCA2 in DNA repair mechanism.
c. Draw a labeled diagram showing Intrinsic and extrinsic pathway of apoptosis.

Good luck

Examiner: Prof Dr Ibrahim Helmy.

Mansoura University
Faculty of Science
Chemistry Department
Subject: Biochemistry
Course: Metabolism regulation and its disorder, Biochemistry 477

Second Term Examination
4rd Level Students
Date May 28, 2013
Time Allowed: Two hours
Full Marks: 60 Marks

Answer the following questions:

I. (15 Marks)

a. List three ways in which insulin causes blood glucose to decrease. **(10 Marks)**
b. Why is the production of ketone bodies elevated in starving people and some diabetics? **(5 Marks)**

II. (15 Marks)

a. What is difference between: **(5 Marks)**
   i. Insulin dependent and non insulin dependent diabetes mellitus
   ii. Galactosemia and Fructose intolerance.

b. Why isn't the hexokinase step (STEP 1) the committed step in glycolysis, since it is irreversible and occurs prior to the phosphofructokinase step (STEP 3)? **(5 Marks)**

III. Give an account on: (10 Marks)

a) Metabolic relationships between the major tissues in the starvation state.
b) The role of Pentose phosphate pathway in protection of red blood cells against free radicals.

IV. Choose the correct answer :(20 Marks, 2 for each)

1. Which of the following statements about the hormonal regulation of glycogen synthesis and degradation are correct?
   a. Insulin increases the capacity of the liver to synthesize glycogen.
   b. Insulin is secreted in response to low levels of blood glucose.
   c. Glucagon and epinephrine have opposing effects on glycogen metabolism.
   d. Glucagon stimulates the breakdown of glycogen, particularly in the liver.
   e. The effects of all three of the regulating hormones are mediated by cyclic AMP.

2. In the well fed state, the major source of FAs for Adipocytes is:
   a. de novo synthesis of FAs
   b. chylomicrons absorbed from the intestine
   c. VLDL coming from liver
   d. all of the above
   e. non of the above

3. You have just eaten a full meal. Within minutes, your liver will respond by
   a. activating glycogen phosphorylase.
   b. activating hormone-sensitive lipase.
   c. activating glycogen synthase.
   d. phosphorylating key regulatory enzymes in a number of metabolic pathways.
   e. stimulating amino acid degradation.

4. You opened your exam and found that you were taking a physiology exam this morning, not the biochemistry you had been studying for. The adrenalin response (epinephrine release) was substantial. Which of the following metabolic changes would NOT take place?

أنظر خلفه

a. increased glycolysis in muscle
b. increased glycogenolysis in liver and muscle
c. mobilization of fatty acids from adipose tissue
d. increased glucose synthesis and release in liver
e. increased glucose uptake by muscle

5. Which of the following is <u>true</u> concerning adipose tissue in the fasting state:
   a. decrease glucose uptake due to decrease circulating insulin
   b. decrease FAs uptake due to decrease lipoprotein lipase activity
   c. increase TAG degradation & production of glycerol for gluconeogenesis by the liver
   d. oxidation of FAs produced from TAG degradation for energy production
   e. all of the above

6. Regulation of metabolic pathways includes all of the following except:
   a. A. Regulation of key enzymes in a pathway.
   b. B. Control transcription and translation to regulate enzyme amounts.
   c. C. Tissue-specific enzymes and receptors.
   d. D. Reciprocal synthetic and degradative pathways utilize the same set of enzymes.
   e. E. Compartmentation of reciprocal synthetic and degradative pathways.

7. Which of the following INCORRECTLY describes a patient with Type I diabetes?
   a. Protein degradation and lipolysis are stimulated.
   b. he excess ketone bodies produced lowers the blood pH.
   c. Glucose uptake by the tissues is stimulated.
   d. Insulin is always necessary for treatment.
   e. Gluconeogenesis is stimulated in the liver.

8. Which of the following statements correctly describes ketone bodies?
   a. They accumulate in children with fatty acid oxidation disorders
   b. They accumulate in diabetes mellitus after insulin therapy
   c. They are produced by muscle but not by liver
   d. They include β-hydroxybutyrate and acetone
   e. They are found in blood but not in urine

9. Von Gierke's disease is characterized by the deficiency of
   a. Glucose-6-phosphatase
   b. α -1 → 4 Glucosidase
   c. 1 → 6 Glucosidase
   d. Liver phosphorylase

10. The major fuel for the brain after prolonged starvation is.
   a. Glucose
   b. Fatty acids
   c. Ketone bodies
   d. Glycerol

Good luck

Examiner: Prof Dr Ibrahim Helmy.