المستوى الرابع- كيمياء حيوية - كيمياء السطح والحفز ك ٢٢٢

Mansoura University
Faculty of Science
Chemistry Department
Course: Physical Chemistry
Date : 19/ 06/ 2012

Second term Examination
Subject: Chemistry (444)
Fourth level, Biochemistry students
Full Mark : 60 Marks
Time Allowed : 2hours

Answer the Following Questions:

أكتب الاجابة الصحيحة فى ورقة الاجابة ٢- وضح حل المسائل فى ورقة الاجابة ٣- الامتحان فى ورقتين

I- Choose the response that best complete each statement: (one mark for each one)

1- In case of auto catalysis:
(a) Reactant catalyses (b) product catalyses
(c) Solvent catalyses (d) heat produced in the reaction catalyses

2- A biological catalyst is essentially:
(a) a carbohydrate (b) an enzyme (c) a nitrogen molecule (d) an amino acid

3- In homogeneous catalytic reactions, the rate of reaction:
(a) Depends upon the concentration of catalyst (b) depends upon physical state of catalyst
(c) is independent of the physical state of catalyst (d) is independent of the concentration of catalyst

4- The activity of catalyst may be increased by:
(a) Cooling (b) Adding in a suitable solvent (c) Powdering (d) Heating

5- Which of the following is wrong about chemisorptions?
(a) It is reversible in nature (b) It first increases with increase of temperature and then pressure
(c) It is specific in nature (d) It involves the formation of a compound on the surface of the solid adsorbent

6- How many layers are adsorbed in chemical adsorption?
(a) Zero (b) One (c) Two (d) Infinite

7- In the adsorption of oxalic acid on activated charcoal, the activated charcoal is known as:
(a) Adsorber (b) Adsorbent (c) Absorber (d) Adsorbate

8- The adsorption of a gas, on a solid surface, varies with pressure of the gas in which of the following manner?
(a) Slow →fast →independent of the pressure (b) Fast →slow →independent of the pressure
(c) Independent of the pressure →slow →fast (d) Independent of the pressure →fast →slow

9- Point out incorrect statement:
(a) Langmuir adsorption assumes that equilibrium is reached when rate of adsorption is equal to the rate of desorption
(b) At high pressures, the Freundlich isotherm assumes the form $x/m \alpha P$
(c) Adsorption involves accumulation of liquid or gas on the surface of a solid
(d) Physisorption involves the formation of multi molecular layers

10- The curve indicating the variation of adsorption with pressure at constant temperature is known as
a) Adsorption isotherm b) adsorption isobar c) adsorption isostere

11- For a catalyzed reaction:
a) The rate constant is higher than the rate constant for the same reaction in the absence of the catalyst
b) The activation energy is higher than the activation energy for the same reaction in the absence of the catalyst
c) The rate of the reaction is slower than the rate for the same reaction in the absence of the catalyst
d) The rate constant is equal to the rate constant for the same reaction in the absence of the catalyst.

12- At high pressure, the entire metal surface gets covered by a mono molecular layer for unimolecular surface reactions of the gas the order of the process is?
(a) Second order (b) First order (c) Zero order (d) fractional order

13- for the process of adsorption the signs of ΔS, ΔH and ΔG are
(a) $\Delta S = -$, $\Delta H = +$ and $\Delta G = -$ (b) $\Delta S = +$, $\Delta H = +$ and $\Delta G = -$
(c) $\Delta S = +$, $\Delta H = +$ and $\Delta G = +$ (d) $\Delta S = -$, $\Delta H = -$ and $\Delta G = -$

14-The ability of a catalyst to accelerate the chemical reaction is known as:
(a) Selectivity (b) Activity (c) Negative catalyst (d) Induced catalyst

15- $2SO_{2(g)} \xrightleftharpoons{V_2O_5}$ is an example for
(a) irreversible reaction (b) heterogenous catalysis (c) homogenous catalyst (d) neutralization reaction

16- The extent of adsorption of a gas on a solid depends on
(a) temperature of the gas **(b)** pressure of the gas
(c) nature of the gas **(d)** all are correct

17- According to adsorption theory of catalysis, the speed of the reaction increases because:
(a) adsorption produces heat which increases the speed of the reaction.
(b) in the process of adsorption, the activation energy of the molecules becomes large.
(c) the concentration of the reactant molecules at the active centres of the catalyst becomes high due to adsorptio
(d) adsorption lowers the activation energy of the reaction.

18- Which of the following characteristics is not correct for physical adsorption?
(a) Adsorption on solid is reversible. **(b)** Adsorption is spontaneous.
(c) Adsorption increases with increase in temperature. **(d)** Both enthalpy and entropy of adsorption are negativ

19- When there are no external forces, the shape of a liquid drop is determined by
(a) Surface tension of the liquid (b) Density of liquid
(c) Viscosity of liquid (d) Temperature of air only

20- Excess pressure inside a soap bubble is
(a) Inversely proportional to its radius (b) Directly proportional to its radius
(c) Directly proportional to square roots of its radius (d) Independent of its radius

21- The rise of a liquid in a capillary tube does not depend upon
(a) Angle of contact (b) Density of the liquid
(c) Radius of the capillary tube (d) Atmospheric pressure

22- A capillary tube is placed vertically in a liquid. If the cohesive force is less than the adhesive force, then
(a) The meniscus will be convex upwards (b) The liquid will wet the solid
(c) The angle of contact will be obtuse (d) The liquid will drip in the capillary tube

23- The surface of water in contact with glass wall is
(a) Plane (b) concave (c) convex (d) Both 'b' and 'c'

24- Surface tension may be defined as
(a) The work done per unit area in increasing the surface area of a liquid under isothermal condition
(b) The work done per unit area in increasing the surface area of a liquid under adiabatic condition
(c) The work done per unit area in increasing the surface is of a liquid under both isothermal and adiabatic conditions.
(d) Free surface energy per init volume

25- The surface tension for pure water in a capillary tube experiment is

(a) $\frac{3g}{2hr}$ (b) $\frac{3}{hr\rho g}$ (c) $\frac{r\rho g}{2h}$ (d) $\frac{hr\rho g}{2}$

II- <u>Answer the following questions (five marks for each one):</u>

a) Camper between Adsorption and absorption

b) Explain the drop weight method used in the determination of the surface tension.

c) The parachor can be used to elucidate the chemical structure – Explain?

<u>IIIAnswer the following questions (10 marks for each one):</u>

a) The reaction of ethylene and hydrogen, $C_2H_4 + H_2 \rightarrow C_2H_6$, on copper surface shows that C_2H_4 is strongl adsorbed than H_2.

1- Derive the rate equation for this reaction.

2- What is the effect of ethylene adsorption on the true activation energy of this reaction?

b) Write briefly on the mechanism of acid-base catalysis.

Prof. Dr.Awad I. Ahmed, Prof Dr. S.A. El-Hakam

Mansoura University **Faculty of Science** **Chemistry Department** **Subject: Organic Chemistry** **Course: Polymer & Environmental Chemistry (Chem 438)**		**Second Term** **Fourth Level – Bio-Chem, Zoology-Chem, & Botany-Chem** **Date: June 30, 2012** **Time allowed: 2 hours** **Full Mark: 60 Marks**

Answer the following questions:

[1] (a) **Define** the polydispersity index of a polymer and **draw** a typical molecular weight distribution curve of a homo- and polydispersed polymers. **[3 Marks]**

(b) **Explain by equations the following statement:**
"The rate of a free radical vinyl polymerization reaction is directly proportional to the square root of initiator concentration". **[8 Marks]**

(c) **Write briefly on** the classification of polymers according to their thermal properties, origin and chain branching. Give examples. **[4 Marks]**

(d) **Mention the main differences** between free radical and condensation polymerization. **[5 marks]**

[2] (a) **Discuss** the molecular weight determination of a polymer by Osmometry, Cryoscopy and Ebulliometry. **[8 Marks]**

(b) **Describe by equations** the general mechanism of the free radical polymerization reactions of styrene in presence of AIBN as initiator and CCl_4 as solvent. **[8 Marks]**

(c) **Show with drawings** the differences between bulk and solution polymerizations. **[4 Marks]**

[3] (a) **Discuss with drawing** the stratification (regions) of the atmosphere. **[7 Marks]**

(b) **Explain by equations** the mechanism of Ozone depletion by Chlorofluorocarbons (CFCs). **[7 Marks]**

(c) There are different types of photochemical reactions occur in the atmosphere. **Write briefly** about **four** of them. **[4 Marks]**

(d) **Mention five** of the most common green house gases responsible for global warming. **[2 Marks]**

With Best Wishes

Examiners:

Dr. Ibrahim M. El-Sherbiny Dr. Mohamed Moneir

المستوى الرابع : كيمياء - كيمياء ونبات - كيمياء وحيوان - (الكيمياء تحليلية بيئية (ك ٤١٣)

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

Second term
4^{th} level(Chem. Biology
Geology and Botany)
Date:2-6-2012
Time allowed:2 hours
Full Mark:60 Marks

Answer the Following Questions

Q1) (24 marks)

a-Explain, with examples, the effect of toxic chemicals on enzymes.

b- Explain the biochemical effects of two only of the following :

(a) Carbon monoxide

(b) Nitrogen oxides

(c) Sulphur dioxide

(d) Cyanide

and suggest antidotes for each

c- Explain the mechanism of action of insecticides.

Q2) (24 marks)

a- Explain biochemical methylation and illustrate propagation of Hg in food chain

b- What are the broad categories of water pollutants? Discuss

c- Give a concise account of the chemical speciation of (two only

(a)Hg (b) Cu (c) Pb (d) As

in the environment

Q3) (12marks)

a- Define the following :

i) Trace elements ii) Heavy metals iii) speciation iv) BOD

b- Write short notes on:

(i) Sanitary landfill method for waste disposal

(ii) Incineration method of waste disposal

Best wishes

المستوى الرابع- كيمياء حيوية - كيمياء تحليلية بيئية (٤١٣ ك)

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

Second term
4th level(Biochemistry)
Date:2-6-2012
Time allowed:2 hours
Full Mark:60 Marks

Answer the Following Questions

QI - Explain the hazardous effects of four only of the followings: (12 marks)

(a) Carbon monoxide
(b) Nitrogen oxides
(c) Bio-warfare agents
(d) Cyanide
(e) Pesticides

How can you treat such hazardous effects.

QII - Give an account on four only of the following: (24 marks)

a- Municipal water treatment.
b- Water quality measurement.
c- Categories of water pollutants.
d- Sources of water pollution.
e- Types of Microorganisms in drinking water which can cause illness.
f- Home water treatment devices.

QIII . Write short notes on four only of the followings: (24 marks)

a- Heavy metals and methods of separation.
b- Acid base phenomena in the hydrosphere
c- The effect of some toxic chemicals on enzymes.
d-Biological oxygen demand.
e-Groundwater pollution prevention.
f- Colloids in hydrosphere.

BEST WISHES

المستوى الرابع . كيمياء حيوية . لائحة ٢٧٩ كيمياء حيوية اكلينيكية

Mansoura University Faculty of Science Chemistry Department Subject: Clin. Biochemistry Course(s): Biochem. (479) .	كلية العلوم جامعة المنصورة	Second Term Fourth Year Chemistry Students Time Allowed: 2 hours Full Mark: 60 Marks Date: June 2012

Answer All Questions

1. a) Illustrate how vitamin deficiency diseases can be diagnosed ? **[10 Marks]**

b) A 23-year-old man was admitted to hospital with fulminant hepatorenal failure. He was jaundiced, with marked abnormalities in his liver function tests. There was also clear evidence of intravascular haemolysis. He had been experiencing vague abdominal discomfort over the past three years, and over that time his liver function tests had been normal with the exception of alanine aminotransferase, which was found to be consistently elevated at 80 U/L (reference range 10-35 U/L). Abdominal ultrasound showed a picture consistent with cirrhosis, with no evidence of biliary obstruction. Blood cultures, antimitochondrial and antinuclear antibodies were negative, as were tests for hepatitis B surface and core antibodies. There was no history of drug abuse, and paracetamol was not detected in the serum. A liver biopsy revealed inflammatory and fatty changes, and stained heavily for copper. Serum ceruloplasmin was slightly decreased at 140 mg/L (reference range 150-600 mg/L). What is the likely diagnosis ? How would you confirm this ? **[10 Marks]**

II. a) Give a brief note on total parentral nutrition (TPN). **[10 Marks]**

b) A 68-year-old retired labourer presented complaining of loss of weight, tiredness and loss of appetite. He had lost 19 kg during the previous three months, but had been eating normally up until three weeks previously. He had experienced no pain, but on questioning admitted to drinking moderately for most of his life. He also stated that he had been passing dark urine for some time and that his stools were quite pale. The examination showed a tired, thin man with jaundice. There was a palpable mass in the right upper quadrant of the abdomen, with no tenderness. Side-room tests on urine showed the presence of bilirubin, and urobilinogen was undetectable. Faecal occult blood was positive. α-Fetoprotein in plasma was not increased. The results of liver function tests were :

Plasma analysis	Result	Reference range	Units
[Albumin]	32	36-47	g/L
ALP activity	632	40-125	U/L
ALT	55	10-40	U/L
[Bilirubin, total]	90	2-17	Mmol/L
GGT activity	200	10-55	U/L

What is the most likely diagnosis ? **[10 Marks]**

III. a) Clinically creatine kinase is of prime importance in diagnosis. Comment. **[10 Marks]**

b) Urine osmolality and renal concentration are important as tubular function tests. Demonstrate. **[10 Marks]**

Prof. A. El-Waseef

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

Second Term Examination
4rd Level Students
Date June 9, 2012
Time Allowed: Two hours
Full Marks: 80 Marks

Answer the following questions:

Q1. (20 Marks)

a) Define the proto-oncogene. What are the mechanisms by which a proto-oncogene can become an oncogene? **(10 Marks)**

b) Compare between each of the following: **(10 Marks)**
i. Benign and malignant tumor.
ii. Gene augmentation and Gene replacement gene therapy.
iii. Carcinoma and Sarcoma.

Q2. (20 Marks)

a) Define apoptosis and explain the role of p53 in regulation of cell division and apoptosis and how loss of p53 gene results in cancer.**(15 Marks)**

b) Enumerate the role of ras oncogene in regulation of cell cycle**. (5 Marks)**

Q3. (20 Marks)

a) Write short notes on: **(15 Marks)**
i.Plant alkaloids as antitumor
ii.Telomerase in cancer cells.
iii.Pro-carcinogen.

b) Explain why loss of the Rb gene results in loss of cell cycle regulation**. (5 Marks)**

Q4. Choose the correct answer :(20 Marks, 2 for each)

1. Cancer cells differ from noncancerous cells in that:
   A. they have elevated levels of telomerase.
   B. they are virtually immortal.
   C. they have the ability to resist apoptosis.
   D. they can maintain telomere length as they divide.
   E. All of these.

2. The role of a tumor suppressor gene:
   A. Is to encode a protein that stimulates cell division.
   B. Is to prevent mistakes in DNA replication.
   C. Is to allow cell division only under appropriate conditions.
   D. All of these.
   E. None of these.

3. The process by which new blood vessels supply a growing tumor is
   A. metastasis. B. promotion. C. malignancy. D. angiogenesis

أنظر خلفه

4. Use the following information to answer question: 1. Promotion 2. Metastasis 3. Anaplasia 4. Initiation. Which of the following is the correct sequence for the development of cancer?
   A. 1, 4, 3, 2 B. 3, 4, 2, 1 C. 4, 1, 3, 2 D. 4, 3, 2, 1

5. One difference between proto-oncogenes and oncogenes is that oncogenes have the potential to
   A. infect viruses. B. inhibit cancer cells.
   C. produce more hormones. D. induce cancerous transformations.

6. Some cancer-causing mutagens have to be activated by an enzyme inside the organism. This process is called:
   A. enzymatic activation. C. interorganismal activation.
   B. metabolic activation. D. seroactivation.

7. Metastasis is
   A. a method of freezing cancer cells for study.
   B. cancer cells' ability to move independently and penetrate other tissues.
   C. a gene that makes cancer cells effectively immortal.
   D. a sequence of "junk DNA" specific to cancer cells.

8. Substitution of one base pair for another can result in a ---------- mutation that results in the conversion of an amino acid specifying codon to a termination codon.
   A. Nonsense B. frameshift C. chromosomal D. missense E. None of these.

9. Cyclins modulate the progression of cells through the cell cycle by
   A. activating protein kinases that are critical regulators of cell division.
   B. directly activating G proteins.
   C. increasing the production of DNA polymerases.
   D. phosphorylating histones.
   E. inducing synthesis of constitutively active forms of growth cell receptors.

10. Chromosome 1 of a neuroblastoma is found to contain a homogenous staining region that encompasses the N-myc gene. What is wrong with the N-myc gene in this tumor?
   A. Gene amplification B. Chromosomal translocation
   B. C. Point mutation D.Virus Integration

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 June 5, 2012
Time Allowed: Two hours
Full Marks: 60 Marks

كيمياء حيوية - الفرقة الرابعة - تنظيم الأيض والعيوب

Answer the following questions:

I. (10 Marks)

a. What is the role of phosphofructokinase2 (PFK2) and Fructose bisphosphatase2 (FBPase2) on regulation of glycolysis and gluconeogensis when glucose is in short supply? **(5 Marks)**

b. Use an "S" to indicate the following metabolic processes that are stimulated by and an "I" to indicate those that are inhibited by the action of insulin. **(5 Marks)**

1) gluconeogenesis in liver
2) entry of glucose into muscle and adipose cells
3) glycolysis in the liver
4) intracellular protein degradation
5) glycogen synthesis in liver and muscle
6) uptake of branched-chain amino acids by muscle
7) synthesis of triacylglycerols in adipose tissue

II. (15 Marks)

a) What is difference between: **(5 Marks)**
   i. Feedback inhibition and Feed forward activation.
   ii. Induction and repression.

b) Discuss the effects of glucose 6-phosphate dehydrogenase deficiency on red cells in hemolytic anemia, and relate them to the biological roles of glutathione. **(5 Marks)**

c) Select the statements from the right column that best describe the metabolism of each organ, tissue, or cell in the left column. **(5 Marks)**

A. brain	(1) releases glycerol and fatty acids into the blood during fasting periods
B. muscle	(2) in a normal nutritional state, utilizes glucose as the exclusive fuel
C. adipose tissue	(3) synthesizes ketone bodies when the supply of acetyl CoA is high
D. liver	(4) can release lactate into the blood
	(5) utilizes a-keto acids from amino acid degradation as an important fuel
	(6) can store glycogen but cannot release glucose into the blood
	(7) can synthesize fatty acids, triacylglycerols,and VLDL when fuels are abundant

III. Give an account on: (15 Marks)

a) Metabolic relationships between the major tissues in the early-fasting state.
b) The Cori and Glucose-Alanine Cycles.
c) Carbohydrate metabolism in the liver in well fed state.

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

1. After a well-rounded breakfast, which of the following would be expected to occur?

   a. Increased activity of pyruvate carboxylase

أنظر خلفه

b. Decreased activity of acetyl CoA carboxylase
c. Decreased rate of glycogenolysis
d. Decreased rate of protein synthesis
e. Increased activity of phosphoenolpyruvate carboxykinase

2. Which of the following steps is involved in the generation of glucose from lipolysis?

a. Glycerol from lipolysis is converted to triglycerides
b. Fatty acids from lipolysis are oxidized, producing NADH and stimulating gluconeogenesis
c. Glycerol from lipolysis is phosphorylated, converted to fructose-1,6-bisphosphate, and eventually converted to glucose
d. Fatty acids from lipolysis stimulate the citric acid cycle
e. Glycerol from lipolysis is taken up by liver cells and dimerized to fructose

3. McArdle's disease causes muscle cramps and muscle fatigue with increased muscle glycogen. Which of the following enzymes is deficient?

a. Hepatic hexokinase
b. Muscle glycogen synthetase
c. Muscle phosphorylase
d. Muscle hexokinase
e. Muscle debranching enzyme

4. Which of the following occur in people with untreated diabetes?

a. Fatty acids become the main fuel for most tissues.
b. Glycolysis is stimulated and gluconeogenesis is inhibited in the liver.
c. Ketone body formation is stimulated.
d. Excess glucose is stored as glycogen.
e. Triacylglycerol breakdown is stimulated.

5. The major process responsible for maintaining blood glucose 40 hours after the last meal is
a. glycolysis
b. glycogenolysis
c. The pentose phosphate pathway
d. gluconeogenesis

6. Glycogen synthetase, the enzyme involved in the biosynthesis of glycogen, may

a. Be activated by the phosphorylation of a specific serine residue
b. Be activated by increased calcium levels
c. Be more specifically defined as UDP-glucose-glycogen glucosyl transferase
d. Synthesize glycogen without a polymer primer
e. e. Employ UDP-D-glucose as a glucosyl donor in both plants and animals

7. The best known cause of galactosemia is the deficiency of

a. Galactose 1-phosphate and uridyl transferase
b. Phosphoglucomutase
c. Galactokinase

d. Lactose synthase

8. Pentose phosphate pathway is of significance because it generates

a. NADPH for reductive synthesis
b. Regenerates glucose 6-phosphate
c. Generates fructose 6-phosphate
d. Forms glyceraldehyde 3-phosphate.

9. Which of the following answers completes the sentence correctly? Regulation of fatty acid biosynthesis occurs at the enzymatic step catalyzed by

a. carnitine acyltransferase I.
b. acetyl CoA carboxylase.
c. pyruvate carboxylase.
d. citrate synthase.
e. citrate-malate translocase.

10. 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

Good luck

Examiner: Prof Dr Ibrahim Helmy.

I

IV

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

Second Term Examination
4rd Level Students
Date June 5, 2012
Time Allowed: Two hours
Full Marks: 60 Marks

كيمياء حيوية - الفرقة الرابعة - تنظيم الأيض والعيوب

Answer the following questions:

I. (10 Marks)

a. What is the role of phosphofructokinase2 (PFK2) and Fructose bisphosphatase2 (FBPase2) on regulation of glycolysis and gluconeogensis when glucose is in short supply? **(5 Marks)**

b. Use an "S" to indicate the following metabolic processes that are stimulated by and an "I" to indicate those that are inhibited by the action of insulin. **(5 Marks)**

1) gluconeogenesis in liver
2) entry of glucose into muscle and adipose cells
3) glycolysis in the liver
4) intracellular protein degradation
5) glycogen synthesis in liver and muscle
6) uptake of branched-chain amino acids by muscle
7) synthesis of triacylglycerols in adipose tissue

II. (15 Marks)

a) What is difference between: **(5 Marks)**
   i. Feedback inhibition and Feed forward activation.
   ii. Induction and repression.

b) Discuss the effects of glucose 6-phosphate dehydrogenase deficiency on red cells in hemolytic anemia, and relate them to the biological roles of glutathione. **(5 Marks)**

c) Select the statements from the right column that best describe the metabolism of each organ, tissue, or cell in the left column. **(5 Marks)**

A. brain	(1) releases glycerol and fatty acids into the blood during fasting periods
B. muscle	(2) in a normal nutritional state, utilizes glucose as the exclusive fuel
C. adipose tissue	(3) synthesizes ketone bodies when the supply of acetyl CoA is high
D. liver	(4) can release lactate into the blood
	(5) utilizes a-keto acids from amino acid degradation as an important fuel
	(6) can store glycogen but cannot release glucose into the blood
	(7) can synthesize fatty acids, triacylglycerols,and VLDL when fuels are abundant

III. Give an account on: (15 Marks)

a) Metabolic relationships between the major tissues in the early-fasting state.
b) The Cori and Glucose-Alanine Cycles.
c) Carbohydrate metabolism in the liver in well fed state.

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

1. After a well-rounded breakfast, which of the following would be expected to occur?

   a. Increased activity of pyruvate carboxylase

أنظر خلفه

b. Decreased activity of acetyl CoA carboxylase
c. Decreased rate of glycogenolysis
d. Decreased rate of protein synthesis
e. Increased activity of phosphoenolpyruvate carboxykinase

2. Which of the following steps is involved in the generation of glucose from lipolysis?

a. Glycerol from lipolysis is converted to triglycerides
b. Fatty acids from lipolysis are oxidized, producing NADH and stimulating gluconeogenesis
c. Glycerol from lipolysis is phosphorylated, converted to fructose-1,6-bisphosphate, and eventually converted to glucose
d. Fatty acids from lipolysis stimulate the citric acid cycle
e. Glycerol from lipolysis is taken up by liver cells and dimerized to fructose

3. McArdle's disease causes muscle cramps and muscle fatigue with increased muscle glycogen. Which of the following enzymes is deficient?

a. Hepatic hexokinase
b. Muscle glycogen synthetase
c. Muscle phosphorylase
d. Muscle hexokinase
e. Muscle debranching enzyme

4. Which of the following occur in people with untreated diabetes?

a. Fatty acids become the main fuel for most tissues.
b. Glycolysis is stimulated and gluconeogenesis is inhibited in the liver.
c. Ketone body formation is stimulated.
d. Excess glucose is stored as glycogen.
e. Triacylglycerol breakdown is stimulated.

5. The major process responsible for maintaining blood glucose 40 hours after the last meal is
a. glycolysis
b. glycogenolysis
c. The pentose phosphate pathway
d. gluconeogenesis

6. Glycogen synthetase, the enzyme involved in the biosynthesis of glycogen, may

a. Be activated by the phosphorylation of a specific serine residue
b. Be activated by increased calcium levels
c. Be more specifically defined as UDP-glucose-glycogen glucosyl transferase
d. Synthesize glycogen without a polymer primer
e. e. Employ UDP-D-glucose as a glucosyl donor in both plants and animals

7. The best known cause of galactosemia is the deficiency of

a. Galactose 1-phosphate and uridyl transferase
b. Phosphoglucomutase
c. Galactokinase

d. Lactose synthase

8. Pentose phosphate pathway is of significance because it generates

a. NADPH for reductive synthesis
b. Regenerates glucose 6-phosphate
c. Generates fructose 6-phosphate
d. Forms glyceraldehyde 3-phosphate.

9. Which of the following answers completes the sentence correctly? Regulation of fatty acid biosynthesis occurs at the enzymatic step catalyzed by

a. carnitine acyltransferase I.
b. acetyl CoA carboxylase.
c. pyruvate carboxylase.
d. citrate synthase.
e. citrate-malate translocase.

10. 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

Good luck

Examiner: Prof Dr Ibrahim Helmy.

I

IV

المستوى الرابع - كيمياء حيوية - الشرات لعام ٢٠١٢

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

Second Term
Final Exam
Fourth Level (Biochemistry)
Date: 23rd June 2012
Time Allowed: Two hours
Full Mark: 60 Marks

Answer ALL the Following Questions

1- Write about the fermentation process and the biosynthetic route leading to the production of ethyl alcohol. What are the uses of its products and by-products?

[20] Marks

2-a) Show how the amino acid lysine is biosynthesized via the aminoadipic acid pathway. Indicate the reason of its production.

[10] Marks

b) Explain how scientists arrived at the structure and the biosynthesis of penicillin G and draw out the fermentation profile (the fermentation flow sheet).

[10] Marks

3- Write about the following:

a) Production of single cell protein (SCP).

[10] Marks

b) Production of α-amylase and protease (clarase).

[10] Marks

-Good Luck-

Examiner: Prof. Dr. Hussein Ghaleb Osman