المستوى الثانى - كيمياء حيوية - الدم والغدد الصماء ccq

Mansoura University
Faculty of Science
Zoology Department
Subject: Physiology Z 225
Courses'Blood-Endocrinology

Second Term
Second Level: Biochemistry
Date: 13-6-2012 الاربعاء
Time Allowed: 2hr
Full Mark: (60)

Answer all Questions: Each Question [20] Mark

[1] A- choose the correct answer: (12 marks)

1- Which of the following organs produce all plasma proteins except the γ- globulins?
a- kidney b- liver c- spleen d- small intestine

2- Antibody B is present in the blood plasma of individuals with blood ----------
a- types A and O b- type B c- types B and A d- types B and O

3- Anemia can be caused by all of the following except ----------
a- nutritional deficiency of vitamin B12 and iron b- hypoxia from smoking or air pollution
c- kidney failure d- failure of gastric production of intrinsic factor

4- During intrauterine life, formation of the RBCs begins in ---------
a- bone marrow b- liver c- spleen d- mesoderm of yolk sac

5- Reticulocyte is immature ----------
a- RBC b- WBC c- platelet d- albumin

6- Hypoxia induces the kidney to produce ---------- , which stimulates the production of ----------
a- platelets ; RBCs b- erythropoietin ; RBCs
c- Fibrinogen ; WBCs d- erythropoietin ; platelets

7- ---------- are the most numerous WBCs , an active phagocytes that increases rapidly during acute infections?
a- monocytes b- eosinophils c- neutrophils d- lymphocytes

8- The process by which WBCs move into and out of the blood vessel is called ----------
a- phagocytosis b- passive transport c- endocytosis d- diapedesis

9- Which sequence is correct for the following events?
1- formation of thromboplastin 2- clot retraction
3- fibrinogen → fibrin 4- prothrmbin → thrombin
a- 1,2,3,4 b- 3,4,1,2 c- 1,4,3,2 d- 3,2,1,4

10- An anemic subject has RBCs count 3.5 million/mm, PVC 42% and Hb 14gm%, by using the blood indices this subject most probably has ---------- anemia. Explain why? (2 marks)
a- aplastic b- macrocytic hyperchromic
c- normocytic normochromic d- microcytic hypochromic

B- Discuss FOUR only of the following: (8 marks)
1- Aplastic anemia 2- fate of red blood corpuscles.
3- Functions of platelets 4- Steps of hemoglobin synthesis.

[2] A- Identify FIVE only of the following: (5 marks)
i- Jaundice ii- Megakaryocytes iii- Hematocrit iv- Monocytes
v- A/G ratio vi- Hematopoiesis vii- Carboxyhemoglobin

B- Fill in the blanks: (5 marks)

a- The phases of hemostasis are: -----(1)-----, -----(2)-------, ----(3)-------
b- Hematocrit value is used in : -----(4)------- , ------(5)-------
c- The types of granulocytes are : -----(6)------, -----(7)-------, -----(8)------
d- Two main factors affecting blood viscosity are: -----(9)-----, -----(10)-----
e- From the general functions of the blood, it regulates: ----(11)-----, ----(12)-----
f- The indictor substance used in measurement of blood volume must be: ----(13) ---- and ---(14)---
g- - -----(15)------- is an enzyme inside RBCs, its function is ------(16)----------

C-Write the reasons for the following diseases and the target organs for responsible hormone for four only from the following cases:-

(10 Marks)

1- Tetany
2- Toxic and simple Goiter
3- Dwarfism and Addisson's diseases
4- Diabetes
5- Pheochromocytoma

[3] A- Complete the following sentences: (5 Marks)

1- The adrenal cortex is composed of ----------; ----------; ----------layers.

2- ACTH and oxytocin hormones secreted from ----------; ----------respectively.

3-Cretinism is due to ---------- and characterized by----------and ----------

4-Parathyroid hormone is secreted in response to----------and----------

5-One hormone called ---------- secreted from delta cell of pancreatic islets.

B-Compare between Graves and Cushing,s syndrome (5 Marks)

C- Effect of organic and inorganic substances in controlling hormone secretion (5 Marks)

D-Choose the correct answer of the following: (5 Marks)

1- One effect of ADH is to ----------
a- decrease urine volume. b- increase blood osmolality.
c- decrease blood volume. d- all of these

2- Which of these is not a method the body uses to regulate its hormonal releases?
a- negative feedback b-direct nervous stimulation
c- release of tropic hormones d-degradation of the endocrine gland

3- The hormone ----------, which is secreted by the adrenal ----------,causes the kidney to conserve sodium and excrete potassium ions and indirectly helps to maintain systemic blood pressure.
a- aldosterone; cortex b- angiotensin I; medulla c- cortisol; cortex d- epinephrine; medulla

4- A deficiency of iodine in the diet causes ----------
a- increased TSH secretion. b-decreased T3 and T4 production.
c- thyroid enlargement (goiter). d-all of these

5- Hypothyroidism in infants can result in _____.
a- Grave's disease b- cretinism c- Hashimoto's disease d- myxedema

Best Wishes

Dr El-Sayed El-Habibi Prof.Dr. Hanaa Hassan

المستوى الثاني - جيولوجيا - رياضيات بحتة ٢٠١٢

الفرقة: الثانيـــــة الشعب: كيمياء- المادة: رياضيات بحتة	كلية العلوم – قسم الرياضيات	دور مايو ٢٠١٢ الزمن: ساعتــــــان التاريخ: ٢٠١٢/٦/٢٤

أجب على الأسئلة الآتية: (٢٠ درجة لكل سؤال)

[1] حل المعادلات التفاضلية الآتيـــــــة :

(i) $(x^2+2y^2)dx - xydy = 0$ [10 marks]

(ii) $(e^y + y\cos x)dx + (\sin x - \sin y + xe^y) = 0 \quad , y(0)=0.$ [10 marks]

[2] أ. حل المعادلة التفاضلية الآتيـــــــة :

$$y' + \frac{y}{x} = \frac{1}{x^3 y^4}$$

[10 marks]

ب. إذا كانت الدالة z معطاة بالعلاقة : $z = \ln(x^6 + x^3y^3 + y^6)$ ، فاثبت أن :

$$x\frac{\partial z}{\partial x} + y\frac{\partial z}{\partial y} = 6$$

[10 marks]

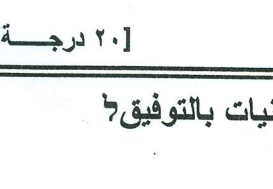
[3] أ. اوجد مساحة المنطقة R في الربع الأول المحصورة بين الدائرتين $x^2+y^2=4$, $x^2+y^2=9$ ، و الخطوط المستقيمة $y=x$ ، $y=0$. [١٠ درجات]

ب. اثبت أن قيمة التكامل : $\int_{(0,0)}^{(1,3)} (4x^3y^2 - 9x^2y)dx + (2x^4y - 3x^3)dy$ لا تعتمد على المسار

الواصل

الواصل بين النقطتين (0,0) ، (1,3) ، ثم احسب قيمته [١٠ درجات]

[4] اذكر نظرية "جرين" .



حقق نظرية "جرين" بحساب كلا الطرفين لمعادلة "جرين" بالنسبة للتكامل :

$$\oint_c (2xy - x^2)dx + (x + y^2)dy$$

حيث c هو المنحنى المغلق للمنطقة المحصورة بالمنحنيات $y = x^2$ ، $x = y^2$

مأخوذاً في الاتجاه عكس عقارب الساعة. [٢٠ درجـــة]

مع التمنيات بالتوفيق

كيمياء حيوية - الديناميكا الحرارية (ك ٢٤١)

Mansoura University Faculty of Science Chemistry Department Subject : Chem. 241 Course(s): Chemical thermodynamics	كلية العلوم جامعة المنصورة	Second Term Year:2rd Biochemistry students Date : 6/6/ 2012 Time Allowed : 2 hours Full Marks : 60 Marks

Answer the following questions:

1) For adiabatic expression of an ideal gas the relation between volume and pressure is given by:
a) V/T = constant b) VT = constant c) PV^{γ} = constant d) $(T/V)^{\gamma-1}$ = constant *(3 marks)*

2) For isothermal expression of an ideal gas:
a) $q = \Delta E$ b) $q = \Delta E + W$ c) $q = W$ d) $\Delta E = 0$ *(3 marks)*

3) When there is no exchange of heat between the system and surroundings the process is said to be: a) isothermal b) adiabatic c) isochoric d) isobaric *(3 marks)*

4) For an isothermal expression of an ideal gas, the change in enthalpy is:
a) positive b) negative c) zero d) impossible to tell *(3 marks)*

5) When one mole of gas condenses to water, the entropy: *(3 marks)*
a) increases b) decreases c) stays the same d) equals zero e) is a negative value

6) Prove the following: a) $\Delta G = -W_{net}$ and $\Delta A = -W_{rev}$ *(5 marks)*

7) One mole of an ideal gas at 27 °C and 100 mm Hg is allowed to expand reversibly and isothermally to 5 mm Hg. Calculate the amount of heat adsorbed *(5 marks)*

8) Write on the following: *(5 marks for each)*
a) formulation of the third law of thermodynamics b) calculation of ΔS from third law of thermodynamics c) calculation of ΔG from thermal data

9) Discuss both Vant Hoff isotherm and isochore *(15 marks)*

10) Fill in the blanks: *(5 marks)*
a) if ΔG° less than zero, K_{eqm} is ..... b) if ΔG° more than zero, K_{eqm} is ..... c) if ΔG° equals zero, K_{eqm} is .....

Good Luck *Prof.Dr.Abd El-Aziz S. Fouda*

	Mansoura University **Faculty of Science** **Chemistry Department**
Second Term **Second Level Biochemistry** **Course Title: Vitamins** **Code No.: Biochemistry 278** **Time allowed: 2 Hours** **Full Mark: 80 Marks**	**May 2012** **Date: 27/ 6/ 2012**

Answer the following questions

Note: Express your answers by formulae, equations, pathways, figures and diagram wherever possible,

Question1: (26 marks)

A- Choose the correct answer: (12marks)

1- These are vitamin D_3-deficiency diseases **except**:
(a) Osteoporosis. (b) Osteopetrosis.
(c) Osteomalacia. (d) Rickets.

2- These are the common names of vitamin B_1 **except**:
(a) Anurine. (b) Anti-beriberi factor.
(c) Anti-glossitis factor. (d) Thiamin.

3- The precursor of CoA is…….
(a) pantothenate. (b) thiamin.
(c) riboflavin. (d) pyridoxamine.

4- All the followings are the functional names of Riboflavin **except** one which is:
(a) Anti-glossitis factor. (b) Anti-hemorrhage.
(c) Anti-conjuctivities. (d) Anti-chylosis

5- Cholesterol is important for the production of the following **except**:
(a) Sex hormones. (b) Cardiglycosides.
(c) Cholicalciferol. (d) Boneabatite.

6- Lipoic acid and TPP act as co-enzymes for……..
(a) Pyruvic dehydrogenase. (c) α–ketoglutarate dehydrogenase.
(b) Glucokinase (d) Both (a) and (c).
(f) Both (a) and (b).

B- Complete the following sentenses: (14 marks)

1- Pellagra is a disease results from a deficiency of .....(1)....., it is prevalent in the Egyptian country because .....(2).....This disease is characterized by .....(3).....and.....(4).....

2- One of the important analysis cattied out on patient who will undergo major surgical operation is ……(5)…….. It is important to give ……(6)……..injection prior to delivery as a prophylac tic measure against haemorhage .

3- Vitamin B12 (cobalamin) as a complex ring structure ……..(7)…….contains …….(8)…… as its centre. This vitamin can be exclusively synthesized by ……(9)……., but it is conserved in animal's liver as ……(10)……., ……...(11)…….. and ……(12)……

4- In the retina, rods are responsible for ……..(13)……., however, cones are responsible for……..……(14)…… .

Question2: (30 marks)

A- Write the chemical structure of the following compounds: (8 marks)

i- Menadione.
ii- Lipoic acid.
iii- Pantothenic acid.
iv- Thiamin hydrochloride.

B- Write briefly notes on: (15marks)

i- Methods for determination of vitamins A and carotenes.
ii- Biosynthesis of the first isoprenoid unit from mevalonic acid.
iii- Biosynthesis of vitamin B_1.

C- Write true or false and correct the following: (7 marks)

i- Dark adaptation means that a normal healthy person comes from dim light to strong light. [ ]

ii- β-carotene is converted into two retinol molecules by the action of hydroxylase. [ ]

iii- The oxidized form of L-ascorbic acid is dihydro-ascorbic acid. [ ]

iv- Biotin plays an important role in dehydrogenation reactions in the form of biotinyl lysine. [ ]

v- The most important physiological function of vitamin K is anti-sterility factor. [ ]

vi- Vitamin B_3 can be biosynthesized in humans and other living organisms from tyrosine. [ ]

vii- Thiamin can not be synthesized in humans , so it must be supplied in food. [ ]

Question3: (24marks)

Write the chemical structure of the following vitamins and their active forms in addition to the biochemical role of each one in simple examples:

a- Vitamin B_6.
b- Riboflavin.
c- Nicotinamid

With my Best Wishes *Dr. Nivin A. S. Islam*

المستوى الثانى - كيمياء حيوية - الأحماض الأمينية والبروتينات ك ٢٧٧

Mansoura University
Faculty of Science
Dept. of Biochemistry
Total Marks are 80.

(ك ح ٢٧٧)
June, 20 , 2012
Time Allowed 2 Hours.
Second year Exam.

Please answer all the following questions:

1- Please choose and rewrite the correct answers in your answer paper: (20 Marks)

1. A positive nitrogen balance occurs:

(A) In growing infant (B) Following surgery (C) In advanced cancer (D) In kwashiorkor

2. The number of ATP required for urea synthesis is:

(A) 1 (B) 2 (C) 3 (D) 4

3. A compound serving a link between citric acid cycle and urea cycle is:

(A) Malate (B) Citrate (C) Succinate (D) Fumarate

4. The 2 nitrogen atoms in urea are contributed by:

(A) Ammonia and glutamate (B) Glutamine and glutamate

(C) Ammonia and aspartate (D) Ammonia and alanine

5. Most of the ammonia released from L-amino acids reflects the coupled action of transaminase and:

(A) L-glutamate dehydrogenase (B) L-amino acid oxidase (C) Histidase (D) Serine dehydratase

6. The enzyme carbamoyl phosphate synthetase requires:

(A) Mg++ (B) Ca++ (C) Na+ (D) K+

7. Small amount of urinary oxalates is contributed by the amino acid:

(A) Glycine (B) Tyrosine (C) Alanine (D) Serine

8. The amino acid which detoxicated benzoic acid to form hippuric acid is:

(A) Glycine (B) Alanine (C) Serine (D) Glutamic acid

9. The amino acids involved in the synthesis of creatine are:

(A) Arginine, glycine, active methionine (B) Arginine, alanine, glycine

(C) Glycine, lysine, methionine (D) Arginine, lysine, methionine

10. Alanine can be synthesized from:

(A) Glutamate and α-ketoglutarate (B) Pyruvate and glutamate

(C) Pyruvate and α -ketoglutarate (D) Asparate and α -ketoglutarate

11. The enzyme dopamine β-oxidase which catalyzes conversion of dopamine to norepinephrine requires:

(A) Vitamin A (B) Vitamin C (C) Vitamin E (D) Vitamin B12

12. All of the following are required for hydroxylation of proline residues except:

(A) Ascorbic acid. (B) Glutamate. (C) Ferrous ions. (D) Molecular oxygen.

13. Cysteine can be synthesized from methionine and:

(A) Serine (B) Homoserine (C) Homocysteine (D) Threonine

ملحوظة: الامتحان فى صفحتين

14. Methionine is synthesized in human body from:

(A) Cysteine and homoserine (B) Homocysteine and serine

(C) Cysteine and serine (D) None of these

15. Hydroxylation of phenylalanine requires all of the following except:

(A) Phenylalanine hydroxylase (B) Tetrahydrobiopterin (C) NADH (D) Molecular oxygen

16. Maple syrup urine disease is an inborn error of metabolism of:

(A) Sulphur-containing amino acids (B) Aromatic amino acids

(C) Branched chain amino acids (D) Dicarboxylic amino acids

17. Cystinuria results from inability to:

(A) Metabolise cysteine (B) Convert cystine into cysteine

(C) Incorporate cysteine into proteins (D) Reabsorb cystine in renal tubules

18. The defective enzyme in histidinemia is:

(A) Histidine carboxylase (B) Histidine decarboxylase (C) Histidase (D) Histidine oxidase

19. All the following statements about serotonin are true except:

(A) It causes vasodilatation (B) It causes bronchoconstriction

(C) It is metabolized by monoamine oxidase (D) Its metabolite is 5-hydroxyindole acetic acid

20. GABA (gamma amino butyric acid) is:

(A) Post-synaptic excitatory transmitter (B) Post-synaptic inhibitor transmitter

(C) Activator of glia-cell function (D) Inhibitor of glia-cell function

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II-Discuss the following: **(30 Marks)**

a. Glycine is essential for formation of energy in muscle.

b. Heme degradation has a diagnostic importance

c. Slenosysteine plays an important role in some enzymes activities.

d. Glutathione and amino acids transportation.

e. Carbamoyl-p synthetases I and II.

f. Phenyl ketone urea and alkaptonura.

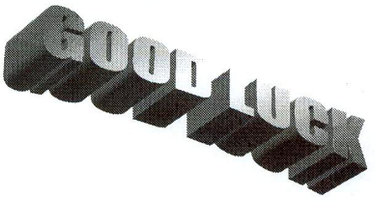
III-Illustrate the biosynthesis and functions of the following:

a) Histamine. **(30 Marks)**

b) SAM.

c) Serotonin.

d) Glutamic acid.



المستوى الثاني - كيمياء حيوية - أيض الأحماض النووية 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: Second Level		**Program (Branch): Biochemistry**	
Subject: Biochem 276	**Course(s): Metabolism of Nucleic Acids**		
Time: 2 hrs	**Date: 10 /06 /2012**	**Full mark: 80**	**Question mark: 20- 30**

Answer the following questions:

Q-1- Choose the correct answer and mention why? (18x2=36 points):

1. In tissues that do not carry out active de novo synthesis, maintenance of an adequate supply of adenine nucleotides:
   A. occurs primarily by adenine salvage using A-PRT.
   B. requires ATP uptake from the blood.
   C. depends upon the action of nucleoside phosphorylase
   D. is accomplished entirely by the action of adenylate kinase.
   E. involves hypoxanthine salvage using HG-PRT.
2. Which of the two catabolic pathways involves reduction and cleavage of the nitrogen-containing ring. A. Catabolism of guanine B. Catabolism of uracil
   A. A only B. B only C. Both A and B D. Neither A or B
3. Orotic acid would be an intermediate during:
   A. Catabolism of guanine B. Catabolism of uracil
   A. A only B. B only C. Both A and B D. Neither A or B
4. Thioredoxin is involved in the:
   A. conversion of AMP to ATP. B. conversion of dUMP to dTMP.
   C. conversion of a ribonucleotide to a deoxyribonucleotide.
   D. inhibition of xanthine oxidase as a treatment for gout. E. degradation of nucleoprotein.
5. The following enzymes are involved in the catabolism of AMP to uric acid. The correct order of their use is: 1. A deaminase 2. A nucleoside phosphorylase 3. A nucleotidase 4. Xanthine oxidase
   A. 1, 2, 3, 4. B. 1, 3, 2, 4 C. 1, 4, 2, 3 D. i3, 2, 1, 4 E. 3, 1, 2, 4
6. The major control of de novo pyrimidine nucleotide synthesis in man is:
   A. feedback inhibition of glutamine-PRPP amidotransferase.
   B. feedback inhibition of aspartate transcarbamylase.
   C. availability of N-acetyl glutamate. D. substrate availability.
   E. competitive inhibition of carbamoyl phosphate synthetase II.
7. In the catabolism of CTP:
   A. uric acid is an end product. B. nitrogen will be released in the form of ammonia. C. the nitrogen-containing ring will be oxidized.
   D. the final product will have the same type of nitrogen-containing ring as CTP.
   E. hypoxanthine will be an intermediate.
8. The formation of dATP for DNA synthesis occurs primarily by:
   A. de novo synthsis beginning with dPRPP. B. salvaging using A-PRT.
   C. salvaging adenine using a nucleoside phosphorylasc and dR 1-P.
   D. converting ADP to dADP using thioredoxin.
   E. converting dIMP to dAMP using 5,10-methylene THF.

9. Which of the following would NOT be expected to contribute to gout?
   A. Unusually high levels of PRPP B. Inhibition of xanthine oxidase
   C. Unusually high turnover of nucleic acids D. High activity of adenosine deaminase
   E. Deficiency of HG-PRT
10. Direct sources of purine ring atoms in the de novo synthesis of IMP include:
   1. glutamine. 2. a component of the tetrahydrofolate one-carbon pool.
   3. aspartate. 4. glycine.
   A. 1, 2 and 3 B. 1 and 3 C. 2 and 4 D. 4 only E. All four
11. A nucleoside phosphorylase:
   1. cleaves a nucleoside with the production of ribose 1-phosphate.
   2. is necessary for the major salvage pathway for pyrimidines.
   3. is used in the degradation of purine nucleotides.
   4. is responsible for the equilibration of nucleoside monophosphates and nucleoside diphosphate. A. 1, 2 and 3 B. 1 and 3 C. 2 and 4
   D. 4 only E. All four
12. Methotrexate is an inhibitor of dihydrofolate reductase. Administration of methotrexate would inhibit:
   1. de novo synthesis of UMP. 2. conversion of dUMP to dTMP.
   3. conversion of IMP to GMP. 4. de novo synthesis of IMP.
   A. 1, 2 and 3 B. 1 and 3 C. 2 and 4 D. 4 only E. All four
13. If a cell has an adequate supply of adenine nucleotides but requires more guanine nucleotides for protein synthesis:
   1. Glutamine-PRPP amidotransferase will not be fully inhibited.
   2. AMP will be a feedback inhibitor of the condensation of IMP with aspartate.
   3. ATP will stimulate the production of GMP from IMP.
   4. ATP will inhibit nucleoside diphosphate reductase..
   A. 1, 2 and 3 B. 1 and 3 C. 2 and 4 D. 4 only E. All four
14. Major controls of de novo AMP synthesis include which of the four choices: 1. allosteric inhibition by GMP. 2. allosteric inhibition by AMP. 3. availability of PRPP. 4. stimulation by GTP..
   A. 1, 2 and 3 B. 1 and 3 C. 2 and 4 D. 4 only E. All four
15. Aspartate plays a role in all of the following EXCEPT:
   A. conversion of UTP to CTP. B. de novo synthesis of AMP.
   C. de novo synthesis of orotic acid. D. maintenance of the adenine nucleotide pool by a salvage mechanism. E. the synthesis of most proteins.
16. Allopurinol is an inhibitor of xanthine oxidase. Administration of allopurinol to a patient with gout and normal HGPRT levels would be expected to lead to all of the following EXCEPT:
   A. decreased de novo synthesis of IMP. B. decreased urate in the urine.
   C. an increase of hypoxanthine in the blood. D. increased levels of PRPP .
   E. tincreased xanthine in the blood.
17. Complete: Synthesis of _____ is the committed step in the synthesis of purine nucleotides. a- de novo, salvage pathways b- glutamine, CO2, aspartic acid
   c- AMP, GMP, IMP d- 5'-phosphoribosylamineCorrect!
18. Complete: PRPP is an activated pentose that participates in the synthesis of _____ & _____ and _____ pathway of purine bases.

a- purines, pyrimidines, salvage b- dNDPs , NDPs c- nucleotides d- pentose phosphate

Q-2- Indicate if the statement is T (for true) or F (for false)and correct the F (24 points)

19. Two of the major medical significance of nucleotides are anticancer agent and antiviral agent.
20. In the biosynthesis of purine nucleotides, the nitrogen N1 comes from glutamine
21. In STEP 1 of the synthesis of Inosine Monophosphate (IMP), ribose-5-phosphate is converted to ribose phosphate pyrophosphokinase by the enzyme PRPP
22. In STEP 6 of the synthesis of Inosine Monophosphate (IMP), formation of 5-aminoimidazole ribotide happens and the AIR synthetase enzyme requires ADP.
23. The phosphoribosyl transferase is the enzyme used to salvage purine bases resulted from the degradation of RNA or DNA.
24. The lack or defect of Hypoxanthine Guanine Phosphoribosyl Transferase leads to Lesch-Nyhan Syndrome.
25. The function of phosphoribosyltransferases is central to the re-synthesis of nucleotides from bases in salvage reactions.
26. Synthesis of carbamoyl phosphate utilizes CPS-II, which is a mitochondrial enzyme, whereas CPS-I is a cytoclic enzyme, and is involved in the urea cycle and arginine biosynthesis.
27. In Step 4 of the biosynthesis of pyrimidines, the oxidizing power for the oxidation of dihydroorotate to orotate is derived from Coenzyme A.
28. In the catabolism of purines; xanthine is converted to uric acid and peroxide using the xanthine oxidase enzyme.
29. Using mutations as biochemical probes to study perfused organ after bathed in an appropriate solution
30. Multiple factors for a metabolic process can be isolated from a cell-free system and then can be reconstituted to test their ability to perform the reaction.

Q-3- Formation of either AMP or GMP requires different intermediates; using your chemistry skills, write down the different chemical steps and equations necessary to form these two molecules. **(20 points)**

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

المستوى الثانى - كيمياء حيوية - أيض الكربوهيدرات والدهون كيمياء

	Mansoura University **Faculty of Science** **Chemistry Department**
Second Term **Second Level Biochemistry** **Course Title: Metabolism of carbohydrates and lipids** **Code No.: Biochemistry 275** **Time allowed: 2 Hours** **Full Mark: 60 Marks**	**May 2012** **Date: 3/ 6/ 2012**

Note: Express your answers by formulae, equations, pathways, figures and diagrams wherever possible,

Answer the following questions

Question 1: (20 Marks)

A- Choose the correct answer: (13 Marks)

1- Hexose monophosphate shunt is considered as the source of:
a- ATP and FAD. b- Hexoses and NAD.
c- Hexoses and NADPH + H^+. d- Pentoses and NADPH + H^+.

2- Which of the following enzyme activities is (are) related to RBCs fragility?
a-Glucose kinase. b- Glucose-6-P-dehydrogenase.
c- 6-phosphogluconoate dehydrogenase. d- Gluconolactone hydrolyase.

3- What is the ATP yield from TCA cycle starting from acetyl CoA.
a- 15 ATP. b- 38 ATP.
c- 12 ATP. d- 30 ATP.

4- Among the factors increasing the activity of pancreatic lipase.....
a- Number and length of fatty acids. b- Degree of unsaturation of fatty acids.
c- Bile salts and calcium ions. d- All choices.

5- Hyperglycemia in diabetes mellitus is due to the following except:
a- Increased rate of gluconeogenesis. b- Decreased uptake of glucose by tissues.
c- Decreased rate of glycogenesis. d- Increased rate of lipogenesis.

6- One of the following statements is not related to diabetes mellitus:
a- Decreased protein anabolism. b- Decreased uptake of amino acids by muscles.
c- Weakness and wasting of muscles. d- Decreased protein catabolism.

7- These are the results of hereditary fructose intolerance (HFI) except:
a- Inhibition of glycogenesis. b- Fructose and fructose-1-P accumulation.
c- Inhibition of glycogen phosphorylase. d- Hypoglycemia and lacacidosis.

8- Cataracts formation may result from the following except:
a- Galactosemias. b- Accumulation of fructose and sorbitol.
c- Cori's disease d- Accumulation of galactose and galacitol.

9- These are normoglycemic causes of glucosuria except:
a- Pregnancy. b- Renal glucosuria.
c- Diabetes mellitus. d- Phlorizin.

10- All the following are glycogen storage diseases except :
a- Type I (Von Gierke's disease). b- Faintness.
c- Type III (Cori's disease). d- Type V (McArdle's syndrome).

11- Among the causes of fasting hypoglycemia.....
a- Glycogen storage diseases. b- Insulinoma.
c- Deficiency of glucocorticoids. d- All chooses.

12- Thyroxine is a hyperglycemic hormone because it increases the blood glucose level by……..

a- stimulating gluconeogenesis. b- stimulating glycogenolysis.
c- Increasing the rate of intestinal absorption. d- both (a) and (b).
e- All (a), (b), and (c).

13- The main pathways for ketogenesis in mitochondria of hepatic cells require high activities of the following except:

a- HMG-CoA lyase. b- HMG-CoA *synthetase.*
c- Isomerase. d- *Thioesterse.*

B-Complete the following statements: (7 Marks)

a- After fatty meal, a transient elevation of ……(1)…..in blood plasma usually occurs and as a result the plasma becomes turbid in appearance. This turbidity disappears if ……(2)….is hydrolyzed to glycerol and fatty acids, this occurs by the enzyme called ……(3) …

b- Ketosis is the result of excessive fat metabolism, which is due to ……(4)……..,…….. …...(5)……..,……..(6)……

c- Lactacidosis means ……(7)……..

Question 2: (20 Marks)

A- Illustrate the following:

a- Steps of biosynthesis of triglycerides. **(6 Marks)**
b- Mechanism of oxidative decarboxylation of pyruvate to acetyl-CoA. **(7 Marks)**

B- Put true (√) or false (x) and correct: (7 Marks)

1- In case of diabetes type II, the body shows increased response to both endogenous and exogenous insulin. [ ]
2- Refsum's disease means accumulation of phytanic acid in tissues due to defect in its β-oxidation. [ ]
3- L-ascorbic acid can be biosynthesized in humans and all organisms. [ ]
4- Fructose-1-phosphate may accumulates in tissues due to the poorer affinity of aldolase B than that of fructose-1,6-diphosphate. [ ]
5- The total ATP gain from β-oxidation of palmitic acid is 131 ATPs. [ ]
6- Glucuronidation reactions are liver detoxication functions. [ ]
7- Galactosemias result from defects in galactose-1-P uridylytransferase and galactokinase. [ ]

Question 3: (20 Marks)

A-Write the reactions leading to the conversion of acetyl-CoA to::

a- β-hydroxy butyric acid. *(5 Marks)*
b- Succinyl-CoA. *(7 Marks)*

B- Demonstrate the biochemical reactions for the conversion of Glucose to D-glucuronic acid. *(8 Marks)*

With my Best Wishes *Dr. Nivin A. S. Islam*