Mansoura University **Faculty of Science** **Chemistry Department** **May 2016** **Date: 15/ 5/ 2016** **Time allowed: 2 Hours**		**Second Term** **Second Level Biochemistry** **Course Title: Metabolism of carbohydrates and lipids** **Code No.: Biochemistry 275** **Full Mark: 60 Marks**

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

Answer the following questions

Question I: **[12 Marks, one Mark /each]**

Give the scientific name of each of the following statements:

No	Statements	Answer
1	**An oxidative pathway of glucose is the major source of NADPH and pentoses.**	
2	**An enzyme deficiency lead to glycogen storage disease Type I (Von Gierke's disease).**	
3	**The key enzyme in glycogenolysis.**	
4	**A hemolytic disease result from a deficiency of erythrocyte glucose 6-phosphate dehydrogenase.**	
5	**An undesirable human behavior results in imbalance in the hepatic NADH/NAD+ and hepatocellular disfunction.**	
6	**A tetrameric enzyme has multiple forms (isozymes), anaerobically catalyses the muscular conversion of glucose to lactate.**	
7	**A glycogen storage disease results from a deficiency of glycogen debranching enzyme.**	
8	**The microsomal fatty acid oxidation causes loss of 4 carbons in each oxidation.**	
9	**The most important test that depends on an enzymatic reaction for detection of glucosuria.**	
10	**An inherited metabolic disorder results from a deficiency of enzymes of α–oxidation and accumulation of phytanic acid in blood and brain tissues.**	
11	**Two enzymes catalyze the oxidative phase of HMP pathway NADP-dependent and generates NADPH.**	
12	**Two hepatocellular enzymes required for ethanol metabolism.**	

Question 2: **[26 Marks, one Mark /each]**

Choose the correct answer:

Don't give more than one answer to a question. – Copy the table in your answer sheet.

No.	1	2	3	4	5	6	7	etc.
Answer								

1- The pentose phosphate pathway is markedly different from glycolysis in, *except:*

a) Oxidation utilizes NADP rather than NAD.
b) CO2 is a characteristic product.
c) ATP is a major product.
d) No ATP is generated.

2- A cause of non fasting hypoglycemia:

a) Severe liver disease.
b) Insulin.
c) Glycogen storage disease.
d) Insulinoma.

3- The hormone stimulates glycogenolysis in both liver and muscle:

a) Thyroxine.
b) ACTH.
c) Adrenaline.
d) Insulin.

4- Hereditary fructose intolerance results from mutations in:

a) fructose-1,6-diphosphatase.
b) aldolase B.
c) fructokinase.
d) phosphofructokinase.

5- Hereditary fructose intolerance is associated with these items *except:*

a) hypoglycemia and lactic acidosis.
b) inhibition of glycogenolysis.
c) fructose and fructose-1-P accumulation.
d) stimulation of glycogen phosphorylase.
f) depletion of ATP levels.

6- Which of the following substrates *derived from adipose tissues* contributes to net Gluconeogenesis in mammalian liver?

a) Alanine
b) Glutamate.
c) Glycerol.
d) Pyruvate.

7- Which of the followings is *NOT* an intermediate of the citric acid cycle?

a) Oxalosuccinate.
b) Citrate.
c) Malate.
d) Succinyl-CoA

8- Which of the following is a coenzyme in the reaction catalyzed by glyceraldehyde 3-phosphate dehydrogenase?

a) ATP.
b) Cu^{2+}.
c) Heme.
d) NAD^{+}.

9– Which of the following enzymes catalyzes a reaction that involves a decarboxylation reaction?

a) Pyruvate dehydrogenase.
b) Isocitrate dehydrogenase.
c) all of the above.
d) α-ketoglutarate dehydrogenase.

10- It is very important to feed the baby very soon after birth, because during the first few hours after birth the enzyme Phosphoenolpyruvate carboxykinase is present in very low amounts, and this fact compromises:

a) Gluconeogenesis.
b) Glucose phosphorylation.
c) Glycogenesis.
d) Glycogenolysis.

11- Asians and Native Americans may flush and feel ill after drinking a small amount of ethanol in alcoholic beverages. This reaction is due to genetic variation in an enzyme that metabolizes the liver metabolite of alcohol, which is.....

a) Methanol.
b) Acetaldehyde.
c) Acetone.
d) Glycerol.

12- Pyruvate dehydrogenase is a multienzyme complex that catalyzes a series of reactions. Which of the following is *NOT*carried out by pyruvate dehydrogenase?

a) a decarboxylation reaction.
b) producing an acetyl group from pyruvate.
c) the production of ATP.
d) combining the acetyl group with a cofactor.

13- Oxidation of which of the following substances yields the most energy?

a) proteins. b) fatty acids.
c) glucose. d) water.

14- These are hyperglycemic causes of *Glucosuria*, *except*:

a) Alimentary glucosuria. b) Renal glucosuria.
c) Diabetic glucosuria. d) Emotional glucosuria.

15- The mechanism of insulin to decrease blood glucose level is by:

a) stimulating lipogenesis. b) inhibiting glycolysis.
c) inhibiting glycogenesis. d) stimulating glycogenolysis.

16- The key enzyme in the biosynthesis of cholesterol is:

a) HMG-CoA decarboxylase. b) HMG-CoA synthetase.
c) Mevalonate decarboxylase. d) HMG-CoA reductase.

17- Cholesterol is changed to bile acids by:

a) 60-70 %. b) 30-40 %.
c) 80-90 %. d) 10-20 %.

18- In biosynthesis of cholesterol, the conversion of lanosterol to zymosterol occurs through:

a) ring closure. b) saturation of the double bond in nucleus.
c) saturation of the double bond in side chain. d) demethylation.

19- Hypercholesterolemia can be caused by:

a) Insulin. b) Starvation.
c) Hyperthyrodism. d) Hypothyrodism.

20- A new mother who is severely lactose intolerant lactate in the absence of dietary dairy products due to:

a) Deficiency of lactose synthetase.
b) Accumulation of Gal-1-p.
c) UDP-Glc/Gal-4-Epimerase.
d) Presence of a-lactalbumin.

21- Fructose can be synthesized from glucose via, respectively:

a) aldol reductase and sorbitol dehydrogenase.
b) galactosyltransferase and sorbitol dehydrogenase.
c) sorbitol dehydrogenase and aldol reductase.
d) glucose 6-phosphate dehydrogenase and sorbitol dehydrogenase.

22- Cataracts formation may result from the following *except*:

a) Galactosemias.
b) Accumulation of fructose and sorbitol.
c) Glycogen storage diseases.
d) Accumulation of galactose and galacitol.

23- Chylomicrons transport dietary lipids from intestines to other locations in the body, are lipoprotein particles consist of ..... and protein (1%).

a) phospholipids (12%), cholesterol (3%).
b) triglycerides (85%), phospholipids (12%), cholesterol (3%).
c) triglycerides (85%), cholesterol (3%), fatty acids.
d) triglycerides (85%), phospholipid (12%).

24- Which of the following statements is *incorrect*?

a) Aerobically, oxidative Decarboxylation of pyruvate forms acetate that enters the TCA cycle.
b) In anaerobic muscle, pyruvate is converted to lactate.
c) Reduction of pyruvate to lactate regenerates a coenzyme essential for Glycolysis.
d) Under anaerobic conditions pyruvate does not form because Glycolysis does not occur.

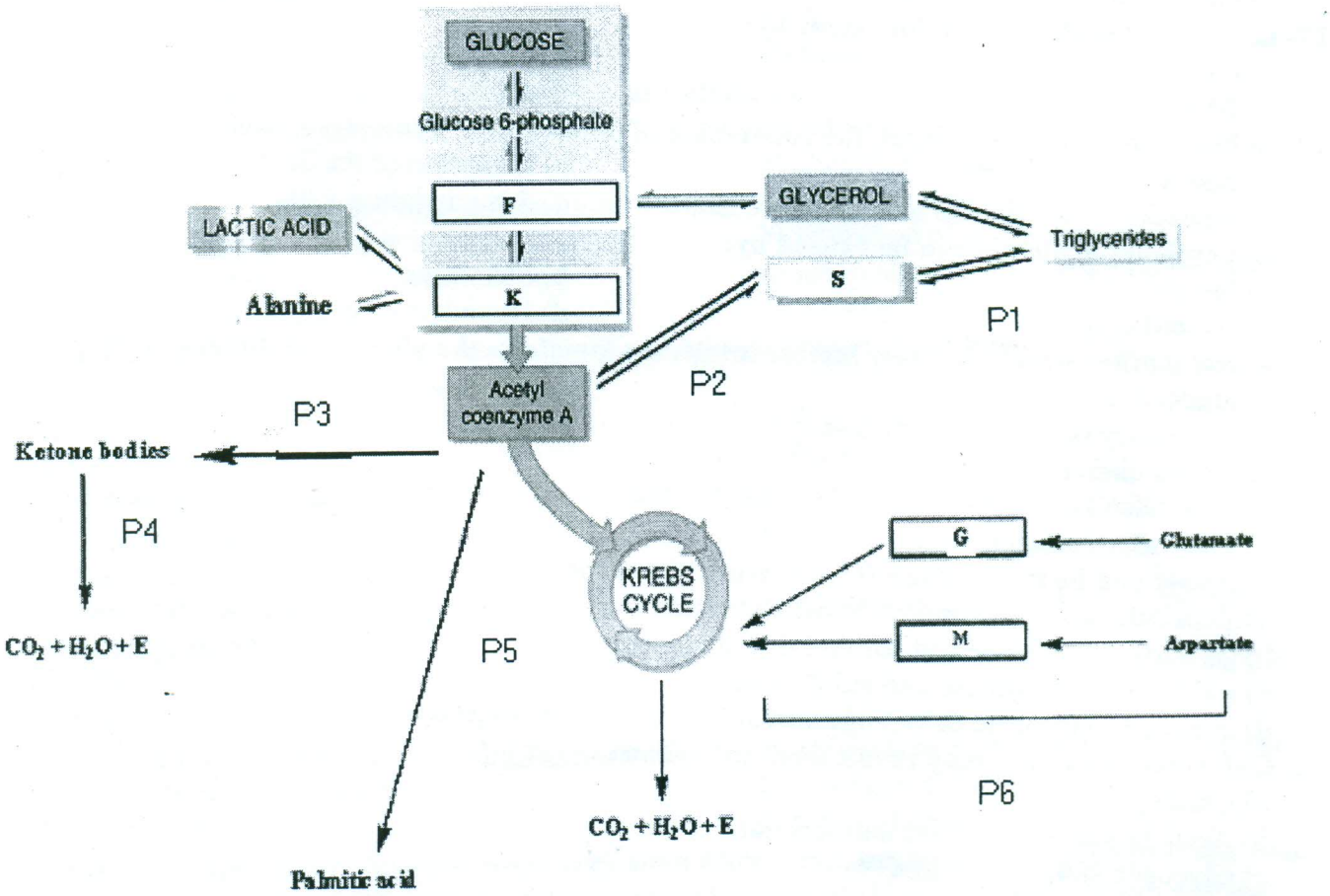
25- Ketosis is caused by all the following items, *except one:*

a) decrease of insulin secretion.
b) starvation.
c) loss of glucose by glucoseuria.
d) low protein intake.
f) high dietary carbohydrates.

26- All items are the metabolic effects of Gal-1-P accumulation in Galoctosemia, *except*

a) Inhibition of phosphoglucomutase.
b) Stimulation of phosphoglucomutase.
c) Disregulation of UDP-glucose.
d) Disregulation UDP-glucuronate metabolism.
f) Appearance of jaundice.

Question 3: [22 Marks]



i- Identify compounds **F** & **K** & **S** & **G** and **M**. **[2.5 Marks]**
ii- Name the pathways **P1** & **P2**? **[2 Marks]**
iii- Discuss **P2** by chemical equations. Describe how to calculate the total ATP gain. **[4 Marks]**
iv- Name the pathways **P3** & **P4** & **P5** & **P6**. **[2 Marks]**
v- What are the biochemical reactions of the pathway **P3**? (Explain) **[4 Marks]**
vi- Follow by equations the pathway **P4.** **[2.5 Marks]**
vii- How does Glucuronic acid be synthesized from glucose? (Illustrate by equations) **[2 Marks]**
viii- Describe how Glucuronides be formed in the liver and intestine. **[3 Marks]**

(support your answer with structurs)

Examiner: *Dr. Nivin A. Salah*

Diploma of Biochemistry Course Title: Amino acids & Proteins Metabolism Code No. Bioch 277	Mansoura University Faculty of Science Chemistry Department	Second Term May 2016 Date: 18/ 5/ 2016 Time allowed: 2 hours Full Mark: 80 Marks

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

Answer The Following Questions

Question I: **[36 Marks]**

A- Give the scientific name of each of the following statements: [20 Marks, 2 Marks /each]

No	Statements	Answer
1	It is the most important route for disposing of nitrogen from the body.	
2	A rare autosomal disorder resulted from a metabolic defect in **reaction 5** of urea biosynthesis.	
3	The proportion of essential amino acids in a food relative to their proportion in a protein that will be synthesized in the body.	
4	An enzyme can release or incorporate ammonium to or from glutamate.	
5	Serves as a precursor for methyl transfer reactions e.g. the conversion of norepinephrin to epinephrine.	
6	A disease results from a metabolic block at glutamate-γ- semialdehyde in proline catabolism.	
7	The difference between nitrogen intake and output is negatively charged.	
8	A common intermediate between carbohydrates and amino acid metabolism of three carbon atoms.	
9	It is the source in metabolism of: Serine.	
10	A metabolic disorder produced from a defect at fumarylacetoacetate hydroxylase (**reaction 4**) in tyrosine metabolism, the untreated acute and chronic cases leads to death from liver failure.	

B- Choose the correct answer: **[16 Marks, 2 Marks /each]**

Don't give more than one answer to a question. – Copy the table in your answer sheet.

No.	1	2	3	4	5	6	7	8
Answer								

1- Which enzyme is essential for the polyamines biosynthesis from ornithine:

a) Ornithine decarboxylase. b) Methionine adenosyl transferase.
c) Ornithine carboxylase. d) SAM carboxylase.

2- The citric acid cycle and the urea cycle are "linked" through the substance:

a) malate. b) fumarate.
c) oxaloacetate. d) ornithine.

3- The first propylamine conjugation to Putrescine yields:

a) Spermine. b) Sprmidine.
c) Squalene. d) Serotonine.

4- One of these is NOT from the factors that stimulate the rate of urea cycle:

a) Animals fed protein-free diets. b) Dietary intake is primarily proteins.
c) Prolonged starvation. d) High rate of synthesis of urea cycle enzymes.

5- Nitric oxide and urea have in common the fact that they both have as an intermediate precursor the amino acid:

a) aspartate. b) arginine.
c) glutamate. d) phenylalanine.

6- High levels of aminotransferases in serum indicate:

a) Brain damage. b) Hyperammonemia.
c) Liver damage. d) Hyperargininemia.

7- S-Adenosyl methionine is essential for the following biosynthesis, *except:*

a) Saccharopine b) Melatonin.
c) Epinephrine. d) Creatinine.

8- The concentrations of these compounds affect the synthesis of serotonin, *except:*

a) 5-hydroxy tryptpphan. b) Tryptophan.
c) S-adenosyl methionine. d) 5-hydroxyindole acetate.

Question II: **[24 Marks]**

A- Copy the table in your answer sheet and write the expected disorder or disease results from the corresponding metabolic defect or block: [10 Marks]

No	Impairment or Block	Disorder
1	Tyrosine aminotransferase (reaction I).	
2	Intestinal and renal transport of tryptophan.	
3	Argininosuccinate synthase activity (reaction 3).	
4	Dihydrobiopterin biosynthesis.	
5	Phenyl alanine hydroxylase.	
1-	Fumarylacetoacetate hydroxylase (reaction 4).	
2-	Elevated levels of β–alanine, taurine and β–aminoisobutulate.	
3-	Proline dehydrogenase	
4-	Homogentisate oxidase (reaction 3) (in late stage of disease).	
5-	Carnosinase deficiency.	
6-	Histidase (reaction 2).	
7-	Glutamyl-γ-semialdehyde dehydrogenase	
8-	*P*-hydroxyphenylpyruvate hydroxylase activity	
9-	Ornithine transcarbamoylase (OTC) (reaction 2)	
10-	Branched-chain α–keto acid dehydrogenase.	

B- What are the specialized products result from the biochemical conversions of the following amino acids: [14 Marks]

1- Arginine.
2- Histidine.

Question III: **[20 Marks]**

Demonstrate the following biotransformations by chemical equations: [5 Marks/ each]

1- Tryptophan to Melatonin.
2- Tyrosine to Epinephrine.
3- Glycine to Creatinine (in muscle).
4- L-Glutamate to γ–Amino buterate.

With My Best Wishs ***Examiner: Dr. Nivin A. Salah***

Mansoura University
Faculty of Science
Chemistry Department
Subject: Chemistry
Course(s):Nucleic acids Metabolism Biochem 276

2nd Level Biochemistry Students
Date : May 2016
Time Allowed : 2 hours
Full Mark: 80 Marks

ANSWER THE FOLLOWING QUESTIONS

I. **Describe the route of the *de novo* synthesis of purine nucleotides, and state the state the different sources of ribose-5- phosphate.** **[20 Marks]**

II. **Do as shown between the brackets:** **[30 Marks]**

a) **Ureidopropionase. (Illustrate the function)**

b) **Dihydroorotate Dehydrogenase. (Describe the function)**

c) **Acute gout. (Explain the different ways of treatments)**

d) **Suppose a deoxypolynucleotide formed of the following primary sequence 5'.....ACTGC...3'. (Draw the chemical structure of the complementary sequence of this polynucleotide chain in the 3' ⟶ 5' direction.)**

e) **Folate analogues and 6-Azauridine. (Draw the structure and describe the function)**

III. **[30 Marks]**

A. **Complete the missing parts in the following sentences. [5 Marks]**

1. Nucleic acids are large organic compounds found in ……..Their polymeric form is with high molecular weights ……. grams per mole.
2. In nucleic acids, numbering system of the nitrogenous bases is ….. while in sugar moiety is ……..
3. The compound that consists of ribose linked by an N-glycosidic bond to N-9 of adenine is……

B. **During replication, the tautomeric form of adenine can pair with cytosine and the tautomeric form of thymine can pair with guanine. Comment and predict the base pairing between those nitrogenous bases.[10 Marks]**

C. ***Describe*** **the route of the catabolism of purine nucleotides. [15 Marks]**

أنتهت الاسئلة

Best wishes for our dear students,

Dr. Amr Negm

Mansoura University **Faculty of Science** **Chemistry Department** **Subject: Chemistry** **Course(s): Chemical Thermodynamics** **Code: Chem 241**		**Second Term** **2nd Level Students** **Date: 29 may 2016** **Time allowed: 2 hours** **Full mark: 60 marks**

Answer the Following Questions: الامتحان في صفحتين

Question 1: **(21 marks)**

Choose the response that best complete for each statement:

1- Thermodynamic parameter, which is state function and is also used to measure disorder of the system is:

a) entropy b) internal energy c) fugacity d) free energy

2- The change in enthalpy of a system is measured by measuring:

a) heat of the process at constant volume b) heat of the process at constant temperature

c) heat of the process at constant pressure d) none of these

3-Which of the following contains only intensive property:

a) mass b) volume c) internal energy d) density

4- The heat capacity at constant pressure is related to heat capacity at constant volume by the relation

a) $C_P + R = C_V$ b) $C_P - C_V = R$ c) $C_V - R = C_P$ d) $R - C_P = C_V$

5- Which out of the following is incorrect?

a) Work done on the system is –ve b) heat flow out of the system is –ve

c) Heat flow into the system is +ve d) none of these

6- A system that can exchange neither energy nor matter to and from its surrounding is:

a) a closed system b) an isolated system

c) an open system d) a homogeneous system

7- In an adiabatic process ---------- can flow into or out of the system.

a) no heat b) heat c) matter d) no matter

8- From the equation dG = -S dT + V dP. Which of the following expression is true?

a) $\left(\frac{dG}{dP}\right)_T = V$ b) $\left(\frac{dG}{dT}\right)_P = -S$ c) $\left(\frac{dG}{dP}\right)_V = \mu$ d) $\left(\frac{dG}{dP}\right)_T = -S$

9-A process which proceeds of its own accord, without any outside assistance, is called

a) non-spontaneous process b) spontaneous process

c) reversible process d) irreversible process

10-The entropy of a pure crystal is zero at absolute zero. This is statement of

a) first law of thermodynamics b) second law of thermodynamics

c) third law of thermodynamics d) none of these

11- The efficiency of a reversible Carnot cycle is maximum when:

a) Temperatures of hot source and cold sink are maximum

b) temperatures of hot source and cold sink are minimum

c) temperature of hot source is maximum and that of cold sink is minimum

d) temperature of hot source is minimum and that of cold sink is maximum

12- The correct expression for Helmholtz free energy (dA) is

a) -SdT + VdP b) TdS + PdV c) -SdT – PdV d) TdS + VdP

13- The internal energy (ΔE) of process does not depend upon:

a) amount of substance b) temperature c) pass of the process d) all of these

14- The chemical potential for real gas is given by

a) $\left(\frac{dG}{dn}\right)_{T,P}$ b) $\mu^\circ + RT \ln a$ c) $\mu^\circ + RT \ln P$ d) $\mu^\circ + RT \ln f$

15-The mathematical expression for work done in adiabatic reversible expansion is

a) $nC_V\Delta T$ b) $-PdV$ c) $-nC_V\Delta T$ d) PdV

16-A machine that can do work by using heat which flows out spontaneously from a high-temperature source to a low-temperature sink is called

a) Carnot machine b) cyclic machine c) heat machine d) heat engine

17- When water is cooled to ice, its entropy

a) increases b) decreases c) remains the same d) becomes zero

18- A chemical reaction proceeds with decrease in both the enthalpy and entropy. This reaction will be spontaneous if:

a) $\Delta H < T\,\Delta S$ b) $\Delta H = T\,\Delta S$ c) $\Delta H > T\,\Delta S$ d) none of these

19-Which of the following equations is used to calculate the heats of reaction when ΔG at two temperatures is given?

a) Van`t Hoff equation b) Clapeyron equation c)Gibbs Helmholtz equation d) none of these

20-For an ideal gas at constant temperature, the entropy is given by

a) $\Delta S_T = nRln\frac{V_1}{V_2}$ b) $\Delta S_T = C_P ln\frac{T_2}{T_1}$ c) $\Delta S_T = nRTln\frac{V_2}{V_1}$ d) $\Delta S_T = nRln\frac{P_1}{P_2}$

21- At any temperature T, the entropy of a solid substance (S_T) given by the expression

a) $C_P dT$ b) $\int_0^T \frac{C_P}{T} dT$ c) C_P/dT d) $\frac{C_P - C_V}{T}$

Question 2: (From 1-5, each of 5 marks)

1- For molar amounts, the standard Gibbs free energy (ΔG°) for the following reaction:

$$2H_{2(g)} + O_{2(g)} \rightarrow 2H_2O_{(g)} \text{ at } 25°C \quad \text{is} \quad 2457.14 \text{ kJ}$$

In a system where $P_{H_2} = 0.775$ atm, $P_{O_2} = 2.88$ atm, and $P_{H_2O} = 0.556$ atm, determine ΔG then equilibrium constant for the reaction when will be in equilibrium

2- Calculate the work done when 3.5 mol of an ideal gas at 27°C expands isothermally and reversibly from a volume 5 L to 25 L.

3- At 373.6 K and 372.6 K the vapour pressure of $H_2O_{(l)}$ are 1.018 and 0.982 atm respectively. What is the heat of vaporization of water (ΔH_{vap})?

4-An ideal gas at STP is expanded adiabatically from 1 L to 5 L. Calculate the final temperature ($C_P/C_V = 1.4$)

5- Define or explain the following terms:

Molar heat capacities - Gibbs free energy - Van't Hoff isotherm - System and surroundings - Internal energy - Second law of thermodynamics - Chemical potential

6- 2-Derive the following:

a) Van`t Hoff equation b) Derive the Clapeyron equation **(each one 7 marks)**

Best wishes;

Prof. Dr. A.S. Fouda, Dr. G.Y. Elewady and Dr. K. Shalabi

الفرقة: الثانيـــــة الشعب: كيمياء-كيم/ح-كيم/ن- جيولوجيا -علوم بيئة-ميكروبيولوجي . المادة: رياضيات بحتة – ر201	كلية العلوم – قسم الرياضيات	دور مايو 2016 الزمن: ساعتـــــان التاريخ: 2016/6/1

أجب على الأسئلة الآتية:

[1] أ. اختبر وجود كل من النهاية التكرارية والنهاية العامة للدالة $f(x,y)=\frac{x^2y^2}{x^4+y^4}$ وذلك عندما تؤول النقطة (x,y) إلى النقطة $(0,0)$. **[10 درجات]**

ب. حل مسألة الشرط الابتدائي : $(x+y)^2\,dx-x^2\,dy=0$, $y(1)=1$. **[10 درجات]**

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[2]أ. إذا كانت الدالة z معرفة كالآتي : $z=\cos^{-1}\left(1+\frac{x^4+y^4}{(x-y)^2}\right)$ ، فاثبت أن $xz_x+yz_y=2(\operatorname{cosec} z-\cot z)$ **[10 درجات]**

ب. اوجد الحل العام للمعادلة : $(2y-\cos x)\,dx+x\,dy=0$. **[10 درجات]**

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[3] أ. اثبت أن قيمة التكامل : $\int_{(0,0)}^{(1,3)}(y^2-4xy-1)\,dx+(2xy-2x^2-3)\,dy$ لا تعتمد على شكل المنحنى الواصل من النقطة $(0,0)$ إلى النقطة $(1,3)$ ، ثم احسب قيمة التكامل. **[10 درجات]**

ب. حل المعادلة : $e^x y'-4xy^2=-e^x y$ **[10 درجات]**

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[4] أ. اوجد الحل العام للمعادلة : $(y^2\cos x+2y\sec^2 x-1/x)\,dx+(2\tan x+2y\sin x)\,dy=0$ **[10 درجات]**

ب. استخدم نظرية "جرين" لتحويل التكامل $\int_c(3x^3-y^3)\,dx+(x^3+5y^3)\,dy$ إلى تكامل ثنائي ، ثم احسب قيمة التكامل الثنائي الناتج ، حيث c هو منحنى الدائرة $x^2+y^2=4$. **[10 درجات]**

أطيب التمنيات بالتوفيق ؛

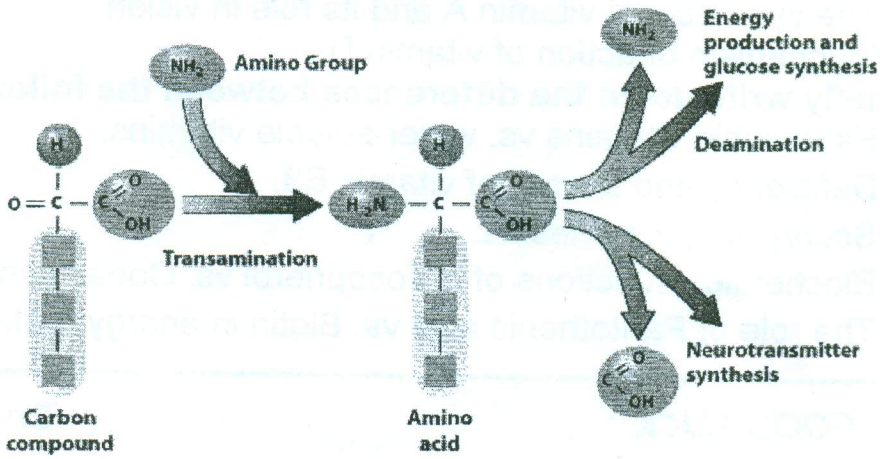
Mansoura university
Faculty of science
Chemistry Department
Subject : Chem.278
Course : Biochemistry

Second Semester Exam 2016
Second level Biochem.Students
Date : May, 2016
Time Allowed : 2 hours
Total Mark : 80 Marks

Answer the following questions

[1] A. Choose the correct answer: (20 marks)

1. The amino acid tryptophan can be used to synthesize
   a. Riboflavin b. Niacin c. Thiamin d. B12
2. A patient complains of joint pain, has bleeding gums, and has a cut that is not healing. What vitamin deficiency might you suspect?
   a. Vitamin C b. Vitamin A c. Vitamin D d. Vitamin K
3. Which of the following is not a function of Vitamin A?
   a. Formation of the visual pigment rhodopsin.
   b. Maintenance of epithelial tissue.
   c. Formation of the blood clotting proteins.
   d. Bone and tooth growth.
4. Enrichment of flour with thiamine resulted in a decline in mortality from which disease?
   a. Berberi b. Pellagra c. Rickets d. Wernicke-Korsakoff syndrome
5. Which of the following statements about bioavailability is false?
   a. The composition of the diet affects the amount of vitamins absorbed
   b. The conditions of the digestive tract affect vitamin bioavailability
   c. The bioavailability of vitamins depends on transport systems
   d. 95% of the vitamins in food are absorbed
6. Which of these vitamins in destroyed by exposure to light?
   a. Vitamin A b. Riboflavin c. Folate d. Vitamin E
7. The actions of _____ are illustrated here:



a. Vitamin B6 b. Vitamin B12 c. Thiamin d. Vitamin C

8. Vitamin D deficiency results in abnormal bone structure because
   a. Magnesium absorption increases.
   b. Collagen is not made correctly.
   c. Calcium absorption decreases.
   d. There is insufficient antioxidant production.
9. Which of the following statements about vitamin K is false?
   a. It is necessary for the formation of prothrombin.
   b. A deficiency results in decreased blood clotting.
   c. It is produced by bacteria in the stomach.
   d. Long-term antibiotic use can result in a deficiency.
10. The water-soluble vitamins include
   a. A, B6, D b. C, Thiamin, K c. A, D, E, K d. B2, Folate, B5

[2] A. Put true (√) or false (X) with correction the false one(s): (10 marks)

1. Thiamin pyrophosphate is the active form of vitamin B3 in our body. ( )
2. Dihydrofolate (DHF) is coenzyme of transferases carrying one carbon units. ( )
3. Taking vitamin D supplements was found to reduce the risk of stroke, cerebrovascular disease, cardial infarction, or ischaemic heart disease. ( )
4. FMN (flavin mononucleotide) and FAD (flavin adenine dinucleotide) used in energy metabolism where they are the prosthetic group of dehydrogenases. ( )
5. Pantothenic acid important role in the synthesis of blood-clotting proteins and bone proteins, which are needed for the postranslation modification of proteins required for blood coagulation. ( )

B. Describe each of the following by using equations: (20 marks)

a. The synthesis of vitamin A and its role in vision.
b. Mechanism of action of vitamin D.

[3] Briefly write down the differences between the following items:(30 marks)

a. Fat-soluble vitamins vs. water-soluble vitamins.
b. Deficiency and toxicity of vitamin B3.
c. Scurvy vs. paresthesias.
d. Biochemical functions of α-Tocopherol vs. Cobalamin.
e. The role of Pantothenic acid vs. Biotin in energy metabolism.

GOOD LUCK Dr. Manar Refaat

Mansoura University
Faculty of Science
Zoology Department
Date: 25th May 2016
Time: 2 hrs.

Program: Biophysics

Z 225, Blood & Endocrine

Full Mark: 60 Marks

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Answer All the following questions:

PART (I) Endocrine glands (30 Marks)

(I): A-Complete the following sentences. .....(10 Marks)

1- Endocrine gland consists of a group of ductless glands. Acts through chemical messenger called .....

2- ..... hormone can inhibit urine production, causes vasoconstriction leading to increased blood pressure.

3- Nervous system consists of the brain, spinal cord and nerves. Acts through chemical messenger called .....

4- ..... hormone Stimulates contractions of the uterus during labor.

5- ..... hormone decreases blood calcium levels by causing its deposition on bone

6- ..... stimulate the kidneys and intestine to absorb more calcium, raising calcium levels in the blood.

7- Hormones of the Adrenal Medulla, Produces two similar hormones (catecholamine's) ..... & ....., these hormones prepare the body to deal with short-term stress.

8- The islets of the pancreas produce hormones ..... – allows glucose to cross plasma membranes into cells from beta cells & .....– allows glucose to enter the blood from alpha cells.

9- .....Produced by Graafian follicles or the placenta, Stimulates the development of secondary female characteristics

10..... Produced by the corpus luteum, Helps in the implantation of fertilized egg in the uterus

(I): B-True or false ..... (10 Marks)

a) Abnormal thyroid development; severe hypothyroidism causes mental retardation.

b) Hypersecretion of the adrenal cortex hormone, leading to Cushing's syndrome, cortisol is primary problem.

c) Diabetes insipidus is the condition of ADH deficiency.

d) Calcitonin (CT) is a single polypeptide chain consisting of 32 amino acids, synthesized in the Parafollicular cells in parathyroid gland.

e) Somatostatin has the ability of inhibiting the secretion of both insulin and glucagon by beta and alpha cells of the pancreatic islets.

f) Hyperglycemia results when alpha cells continuously secrete glucagon hormone.

g) Gonadal hormone production is regulated by hormones secreted by posterior pituitary gland.

h) Gastrin& cholecystokinin are hormones secreted by special cells in adrenal gland.

i) FSH aids in the maturation of ovarian follicles in females and sperm production.

j) Testosterone is responsible for growth and maturation of the uterus and fat distribution.

(II) Explain and Answer TWO only of the following questions. .....(10 Marks)

(i)- The most important glucocorticoid in humans is cortisol. It exerts various metabolic effects, which is generally catabolic. Cortisol also has potent pharmacological effects However; these effects are produced only by large doses (pharmacologic doses). Explain the Pharmacological Effects of cortisol?

(ii)- Secretion of hormones is closely controlled by three different ways: Explain and give one example for each type?

(iii)- The synthetic (chemical) steps of thyroid hormones.

تعليمات الاجابة

السؤال الاول (A): أكتب الجملة كاملة مع وضع خط تحت الكلمة التى تمت اضافتها وكتابة رقم الجملة بشكل واضح .

السؤال الأول (B): أكتب الحرف الدال على الجمله مع وضع علامة (V) أو علامة (X) قرين كل حرف فى جدول

السؤال الثانى : اشرح بالتفصيل اثنين فقط واستعن بالرسم كلما أمكنك ذلك.

Part II: Hematology 30 marks

(III) Answer the following questions: .....(15 marks)

1. **Describe the morphology and explain the function of lymphocytes:**
2. **List the different technique for plasma protein separation And Factors Affecting Electrophoresis**
3. **What is Low A/G mean?**

(IV) Answer the following items: ..... (15marks)

1. **What is hematopoiesis? Briefly outline Erythropoiesis and the main factors affecting this process.**
2. **Illustrate the main mechanism of a blood clot formation.**

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Best wishes

Prof. Dr. M. Amr El-Missiry & Prof. Dr. Maher Amer