
	TANTA UNIVERSITY FACULTY OF PHARMACY DEPARTMENT OF BIOCHEMISTRY			
	COURSE TITLE:	CLINICAL BIOCHEMISTRY	COURSE CODE: 4143	
DATE:	9/6/2014	THIRD YEAR	TOTAL ASSESSMENT MARKS: 150	TIME ALLOWED: 2 HOURS

INSTRUCTIONS:

- Check that the exam booklet consists of (8) pages
- All questions are to be attempted
- Answers should be written in the specified spaces
- Blue pens should be used
- Oral exam will be immediately after the end of the written exam
- Each student should commit to his/her oral exam committee
- Each student should assign in the attendance sheet
- Mobile phones shouldn't be hold

Good Luck

EXAMINERS	DR. NAHLA EL-ASHMAWY
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QUESTION ONE:

Regarding the underlined words mark (✓) for correct or (X) for false statements and correct the false ones: (16x1.5= 24 Marks)

1.	<u>Urea clearance</u> is the preferred test for measurement of GFR	()
If false, the correct statement is:		
2.	Bence Jones protein is one of the <u>hematological characteristics</u> of multiple myeloma	()
If false, the correct statement is:		
3.	Edema results from <u>hyperbilirubinemia</u>	()
If false, the correct statement is:		
4.	In multiple myeloma, scanning of plasma protein electrophoresis shows <u>beta-gamma bridge</u>	()
If false, the correct statement is:		
5.	<u>Fanconi syndrome</u> is associated with massive proteinuria	()
If false, the correct statement is:		
6.	Cholestasis is associated with <u>unconjugated hyperbilirubinemia</u>	()
If false, the correct statement is:		
7.	Excessive alcohol intake causes elevation of <u>LDL-cholesterol</u>	()
If false, the correct statement is:		
8.	Broad beta band in plasma lipoprotein electrophoresis <u>indicates type IV hyperlipidemia</u>	()
If false, the correct statement is:		
9.	Measurement of plasma lipids require <u>fasting for at least 12 hours</u>	()
If false, the correct statement is:		
10.	VLDL appears at <u>pre-beta</u> region in lipoprotein electrophoresis	()
If false, the correct statement is:		

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11.	<u>Citrate deficiency</u> may aid formation of renal stones	()
If false, the correct statement is:		
12.	<u>Type I hyperlipidemia</u> results from deficiency of lipoprotein lipase	()
If false, the correct statement is:		
13.	<u>CRP</u> is one of the acute phase reactants	()
If false, the correct statement is:		
14.	The expression of LDL receptors on the cell surface is <u>regulated by the intracellular cholesterol concentration</u>	()
If false, the correct statement is:		
15.	Albumin is <u>the most anodic protein</u> in serum protein electrophoresis	()
If false, the correct statement is:		
16.	Elevated blood levels of Lp(a) is associated with increased risk for <u>cardiovascular disease</u>	()
If false, the correct statement is:		

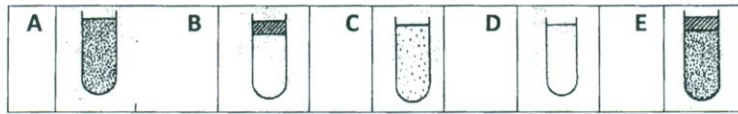
QUESTION TWO: Select the ONE correct answer and mark in the provided answer sheet on page (5): **(34x1.5= 51 Marks)**

- 1) Intracellular cholesterol acts to:
 - a. Inhibit HMG-CoA reductase, the rate limiting step in cholesterol synthesis
 - b. Inhibit LDL receptor synthesis
 - c. Stimulate cholesterol esterification by stimulating the enzyme ACAT
 - d. All of the above
- 2) The leading causes to liver cirrhosis include all of the following **EXCEPT**:
 - a. Chronic active viral hepatitis
 - b. Deficiency of UDPG-transferase
 - c. Wilson`s disease
 - d. Haemochromatosis
- 3) Crohn`s disease is characterized by:
 - a. Malabsorption
 - b. Low plasma albumin
 - c. Ulcerated mucosa
 - d. All of the above
- 4) In autoimmune diseases, serum protein electrophoresis is characterized by:
 - a. Diffuse band in the γ globulin region
 - b. M spike
 - c. Absence of albumin band
 - d. Beta-gamma bridge
- 5) In patients with homocystinuria the urine usually contains:
 - a. Homocystine
 - b. Methionine
 - c. Methionine sulfoxide
 - d. All of the above

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- 6) Renal tubular acidosis is characterized by all of the following **EXCEPT**:
- a. Acidic pH of the urine
 - b. Hypokalemia
 - c. Metabolic acidosis
 - d. Loss of bicarbonate ions
- 7) Genetic deficiency of branched-chain α -keto acid dehydrogenase complex results in:
- a. Fanconi syndrome
 - b. Cystinuria
 - c. Maple syrup urine disease
 - d. Nephrotic syndrome
- 8) Regarding hemolytic jaundice, which of the following statements is **CORRECT**?
- a. It is the consequence of UDPG-transferase deficiency
 - b. Both conjugated and unconjugated bilirubin are increased
 - c. ALT and AST are elevated
 - d. It may result in formation of pigment gall stones
- 9) Regarding neonatal jaundice, which of the following statements is **INCORRECT**?
- a. It may cause kernicterus
 - b. Sulfonamides and salicylates are recommended
 - c. It is a type of unconjugated hyperbilirubinemia
 - d. Phototherapy is recommended when bilirubin levels are elevated
- 10) Severe edema would be associated with all of the following **EXCEPT**:
- a. Fall in renal blood flow
 - b. Stimulation of the secretion of renin and aldosterone
 - c. Decrease in ECF volume
 - d. Sodium and water retention
- 11) Regarding LDL receptor, which of the following statements is **INCORRECT**?
- a. It binds to lipoproteins containing apo B-48
 - b. It is present on the surface of the cell in "coated pits"
 - c. It internalizes LDL particles within the cell by endocytosis
 - d. It is present in all tissues
- 12) Regarding Lp(a), which of the following statements is **CORRECT**?
- a. It is nearly identical in structure to an HDL particle
 - b. Elevated Lp(a) stimulates the breakdown of blood clots
 - c. It competes with plasminogen for the binding of plasminogen activators
 - d. Both a & b
- 13) Causes of post-renal uremia include all of the following **EXCEPT**:
- a. Decreased plasma volume and renal blood flow
 - b. Renal stones
 - c. Prostatic enlargement
 - d. Carcinomas of urinary tract
- 14) A defective hydrogen ion secretion in the distal tubule is known as:
- a. Type I renal tubular acidosis
 - b. Type III renal tubular acidosis
 - c. Type II renal tubular acidosis
 - d. Type IV renal tubular acidosis

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For **Questions 15-19** select the appropriate picture from the above-shown plasma appearance tests

- 15) Type I hyperlipoproteinemia
- 16) Type IIb hyperlipoproteinemia
- 17) Type IV hyperlipoproteinemia
- 18) Type V hyperlipoproteinemia
- 19) Plasma appearance for normal fasting lipid profile

A	Albumin	B	Ceruloplasmin	C	α 1-Antitrypsin	D	Triglycerides
E	CRP	F	GGT	G	Creatinine	H	Erythropoietin

For **Questions 20-27** select the appropriate from the above-mentioned biological substances

- 20) Maintains plasma oncotic pressure
- 21) Its daily production is relatively constant, being a function of total muscle mass
- 22) Is synthesized by the kidney
- 23) Can be used to monitor day-to-day changes in the inflammatory response
- 24) Prevents the spread of tissue necrosis when lysosomal enzymes are released by damaged cells at the site of injury
- 25) Carried in blood by chylomicrons and VLDL
- 26) Diagnostic enzyme for bile disorders
- 27) Oxidizing enzyme that is deficient in patients with Wilson's disease

A	Kernicterus	B	Liver cirrhosis	C	Diabetes insipidus	D	Fatty liver
E	Fanconi syndrome	F	Reye's syndrome	G	Acute tubular necrosis		

For each characteristic in **Questions 28-34** select the appropriate disorder from A to H:

- 28) Decreased BUN/creatinine ratio
- 29) Fibrosis, scarring and destruction of the normal architecture
- 30) Frequently associated with viral disease of children, especially when treated with medications such as salicylates
- 31) Polyuria and urine/plasma osmolality <1.0
- 32) May occur secondary to diabetes mellitus
- 33) Glycosuria, aminoaciduria, phosphaturia and renal tubular acidosis
- 34) Unconjugated hyperbilirubinemia

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Answer Sheet for Question TWO (34x1.5= 51 Marks)

No.	A	B	C	D	E	No.	A	B	C	D	E	F	G	H
1						18								
2						19								
3						20								
4						21								
5						22								
6						23								
7						24								
8						25								
9						26								
10						27								
11						28								
12						29								
13						30								
14						31								
15						32								
16						33								
17						34								

QUESTION THREE: Read the following clinical case and answer the related questions: (10 Marks)

A patient was admitted to hospital with frequent diarrhea, weight loss, steatorrhea, stomach pain, abdominal discomfort, flatulence and bloating. The physician has ordered some laboratory tests to aid the assessment and differentiation of pancreatic insufficiency and pancreatitis.

- What are the tests required to differentiate between these two diseases?

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- Write short account about one of the required tests (reaction mechanism, procedure and specimen)

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QUESTION FOUR:

I. Complete the following statements: (15x1=15 Marks)

- 1- Glucagon promotes glucose production viaand.....
- 2-..... assays used in the diagnosis of gastrinomas such as in the syndromes.
- 3- Patients with myeloma overproduce monoclonal immunoglobulin, protein secreted into the urine where it can be measured.
- 4- The isoenzymes of creatine kinase(CK) have been assessed by and methods.
- 5- The decrease ability of tissues to respond properly to normal circulating insulin is called
- 6- The body's natural reaction to the fluid expansion in CHF is to release from the heart muscle of left ventricle.
- 7- is the mechanism by which old or damaged cells normally self – destroyed.
- 8- facilitate sweating by introduction of a drug through intact skin by application of a direct electric current.
- 9- is the earliest marker of cardiac damage in AMI.
- 10- Increasing concentration of amylase in blood is clinically significant to the diagnosis of while low levels of serum amylase indicate such as

II. Write (T) for true or (F) for false for each of the following statements and correct the false one regarding the underlined words:

(10x1.5= 15 Marks)

- 1- The CA 19-9 detect colorectal cancer, pancreatic cancer and it is the best tumor marker for following patients with cancer of the pancreas ()
- 2- OGTT is indicated in persistent fasting hyperglycemic patients ()
- 3- Troponins released from heart muscle remain in the bloodstream from 1 to 4 days after onset of AMI ()

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- 4- Ketoacidosis in type 1 diabetes mellitus is rare but may be precipitated by myocardial infarction or trauma ()
- 5- During AMI, the flipped pattern (LDH1>LDH2) lasts up to 3 to 4 days after the heart attack ()
- 6- Fructosuria is a metabolic disorder due to enzyme defects in fructokinase, fructose-1-phosphate, aldolase or fructose-1,6-diphosphatase ()
- 7- AFP is the tumor marker of choice for detection of lung cancer ()
- 8- The hexokinase method for measurement of glucose involves two enzymes, hexokinase and peroxidase ()
- 9- The detection of hypoglycemia is by blood glucose testing but urine testing cannot detect it ()
- 10- Dehydration occurs due to loss of gastric fluid, it causes relative decrease in sodium and chloride but increases BUN ()

QUESTION FIVE: Write short account on each of the following:
(5x7=35 Marks)

1- Hormones as tumor markers (Enumerate)

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2- Fructosamine measurement application

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3- Lactose Breath Test

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4- Von Gierke' s disease

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5- Biomarkers of myocardial infarction (Enumerate)

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GOOD LUCK