


Course No: PHARM 2315
Course Title: Biochemistry
Date: 01/06/ 2017
No. of Questions: (5)
Time: TWO hours
Using Calculator (Yes)

University of Palestine

Final Exam
Second Semester 2016/2017
Total Grade: 50 Marks

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Student No.: _____
Student Name: _____
College Name: _____
Dep./Specialist: _____
Using Dictionary (No)

Question (1)) Put the sign (✓) against the right sentences and the sign (X) against the wrong sentences:(10 Marks)

- (.....) Fats and oils are the principal stored forms of energy in many organisms.
- (.....) Fatty acids are carboxylic acids with hydrocarbon chains ranging from 4 to 36 carbons long (C_4 to C_{36}).
- (.....) Membrane lipids are amphipathic: one end of the molecule is hydrophobic, the other hydrophilic.
- (.....) Vertebrate heart tissue is uniquely enriched in ether lipids; about half of the heart phospholipids are plasmalogens.
- (.....) Ceramide is the structural parent of all glycerophospholipids.
- (.....) Sphingomyelins like glycerophospholipids and galactolipids they contain glycerol.
- (.....) Phospholipase C is hydrolytic enzyme catalyzes the breakdown of ester bond at C_1 of triglyceride.
- (.....) Tay-Sachs disease, in which ganglioside GM_2 accumulates in the brain and spleen due to lack of the enzyme sphingomyelinase.
- (.....) Inositol 1,4,5-trisphosphate(IP_3) is water-soluble triggers release of Ca^{2+} from the endoplasmic reticulum.
- (.....) Overproduction of leukotrienes causes asthmatic attacks.
- (.....) 1,25-dihydroxycholecalciferol regulates calcium uptake in the intestine and calcium levels in kidney and bone.
- (.....) Warfarin is a synthetic compound that inhibits the formation of active prothrombin.
- (.....) Condensation of acetyl-CoA with oxaloacetate to form citrate, catalyzed by pyruvate dehydrogenase.
- (.....) The base of a nucleotide is joined covalently at N-9 of pyrimidines and N-1 of purines.
- (.....) DNA that contains high concentrations of A and T denatures at a higher temperature than G- and C- rich DNA.
- (.....) In the prokaryotic cells, there are four rRNA species (28S, 18S, 5.8S, and 5S).
- (.....) DNA is a polymer of deoxyribonucleoside monophosphates covalently linked by 3'→5' phosphodiester bonds.
- (.....) Attachment of a specific amino acid to its corresponding tRNA by aminoacyl-tRNA synthetase.
- (.....) DNA polymerase I fills up gaps between Okazaki fragment to form lagging strand
- (.....) In biosynthesis of proteins the chain terminating codons are UAA, UAG and UGA

Question (2) Select and circle the correct answer from the following: (13 Marks)

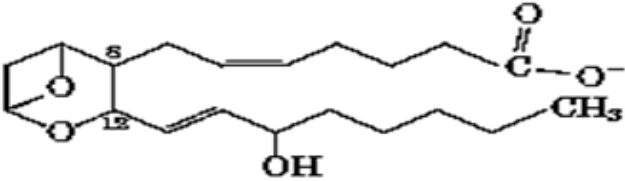
1-	An example of a saturated fatty acid is		
(a)	Palmitic acid	(b)	Oleic acid
(c)	Linoleic acid	(d)	Linolenic acid
2-	The number of double bonds in Linolenic acid is		
(a)	3	(b)	2
(c)	1	(d)	0
3-	The importance of phospholipids as constituent of cell membrane is because they have		
(a)	Both polar and nonpolar groups	(b)	Fatty acids
(c)	Glycerol	(d)	Phosphoric acid
4-	Gangliosides derived from glucosylceramide contain in addition one or more molecules of		
(a)	Sialic acid	(b)	Glycerol
(c)	Diacylglycerol	(d)	Hyaluronic acid
5-	Molecular formula of cholesterol is		
(a)	C ₂₇ H ₄₅ OH	(b)	C ₂₉ H ₄₇ OH
(c)	C ₂₉ H ₄₇ OH	(d)	C ₂₃ H ₄₁ OH
6-	Dietary fats after absorption appear in the blood as		
(a)	Chylomicron	(b)	VLDL
(c)	LDL	(d)	HDL
7-	Free fatty acids are transported from adipose tissues to other cells in the blood		
(a)	Combined with albumin	(b)	Combined with fatty acid binding protein
(c)	Combined with β -lipoprotein	(d)	In unbound free salts
8-	Gaucher's disease is due to deficiency of the enzyme:		
(a)	Glucocerebrosidase	(b)	Sphingomyelinase
(c)	Galactocerebrosidase	(d)	β -Galactosidase
9-	The enzymes of β-oxidation of are found in		
(a)	Mitochondria	(b)	Cytosol
(c)	Golgi apparatus	(d)	Nucleus
10	Niemann-Pick disease is due to deficiency of the enzyme:		
(a)	Sphingomyelinase	(b)	Glucocerebrosidase
(c)	Hexosaminidase A	(d)	None of these
11-	The lipoprotein richest in cholesterol is		
(a)	Chylomicrons	(b)	LDL
(c)	VLDL	(d)	HDL
12-	Which of the following is omega-3 polyunsaturated fatty acid?		
(a)	Oleic acid	(b)	Linolenic acid
(c)	Linoleic acid	(d)	None of these
13-	A pyrimidine nucleotide is		
(a)	GMP	(b)	CMP
(c)	AMP	(d)	IMP

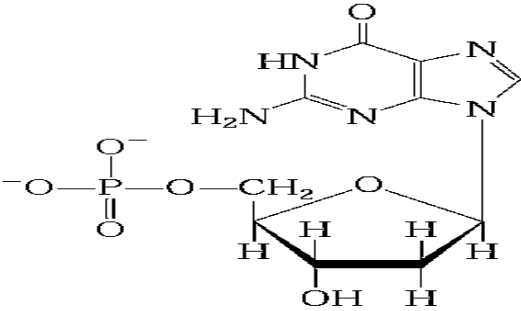
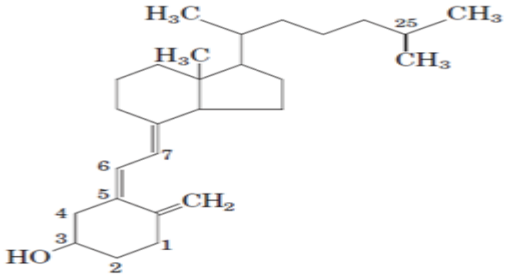
14-	The carbon of the pentose in ester linkage with the phosphate in a nucleotide structure is		
(a)	C ₁	(b)	C ₃
(c)	C ₄	(d)	C ₅
15-	In contrast to eukaryotic mRNA, prokaryotic mRNA		
(a)	Is synthesized with introns	(b)	Can only be monocistronic
(c)	Has a poly A tail	(d)	Can be polycistronic
16-	The structure of tRNA appears like a		
(a)	Helix	(b)	Coil
(c)	Hair pin	(d)	Clover leaf
17-	Double helical structure model of the DNA was proposed by		
(a)	Pauling and Corey	(b)	Peter Mitchell
(c)	King and Wooten	(d)	Watson and Crick
18-	Oxidation of odd-number fatty acids (propionate 3C) produces		
(a)	Acetoacetyl-CoA	(b)	Fumarate
(c)	Succinate	(d)	Succinyl-CoA
19-	Ketone bodies are synthesized in		
(a)	Adipose tissue	(b)	Muscles
(c)	Brain	(d)	Liver
20-	An enzyme required for the synthesis of ketone bodies is		
(a)	Acetyl CoA carboxylase	(b)	HMG CoA reductase
(c)	Pyruvate dehydrogenase	(d)	HMG CoA synthase
21-	The amino terminal of all polypeptide chain at the time of synthesis in <i>E. coli</i> is tagged to the amino acid residue:		
(a)	Methionine	(b)	Serine
(c)	N-formyl methinine	(d)	N-formal serine
22-	Initiation of protein synthesis begins with binding of		
(a)	Attachment of aminoacyl tRNA on mRNA	(b)	Charging of tRNA with specific amino acid
(c)	40S ribosomal unit on mRNA	(d)	60S ribosomal unit
23-	Okazaki fragments are small bits of		
(a)	RNA	(b)	DNA
(c)	DNA with RNA heads	(d)	RNA with DNA heads
24-	Codons are in		
(a)	DNA	(b)	tRNA
(c)	mRNA	(d)	rRNA
25-	In DNA, which one of the following sequences is complimentary to TGGCAGCCT?		
(a)	ACC GUC GGA	(b)	AGG CTG CCA
(c)	ACC GTC GGA	(d)	TGG CTC GGA
26-	Nucleic acid show strong absorption at one of the wavelength:		
(a)	360 nm	(b)	280 nm
(c)	260 nm	(d)	220 nm

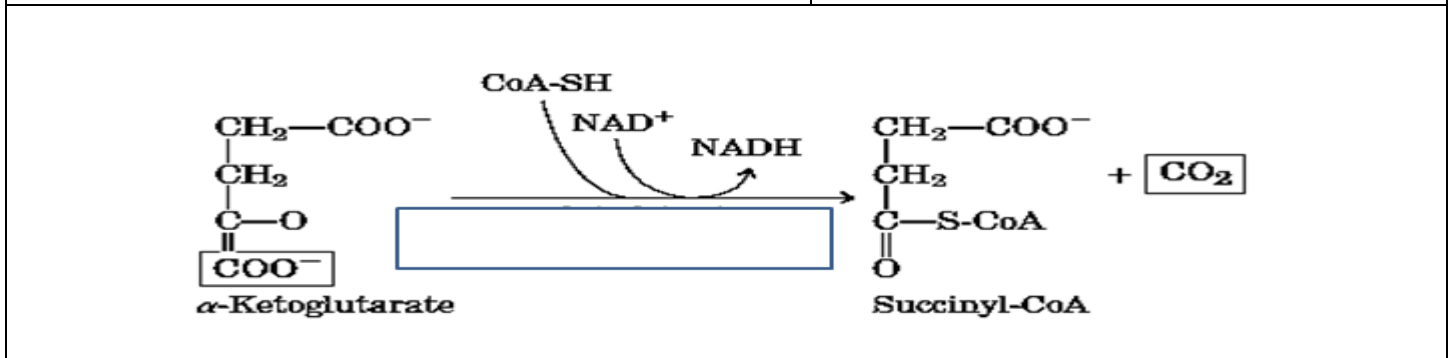
27-	In electron transport chain, which of the following complexes does not pump protons into intermembrane space of mitochondria		
(a)	NADH dehydrogenase	(b)	Cytochrome bc ₁
(c)	Succinate dehydrogenase	(d)	Cytochrome c oxidase

Question (3) Name or draw the structural formula of the following molecules : (7 Marks)

<p>Tripalmitin</p>	<p>Linoleic acid</p>
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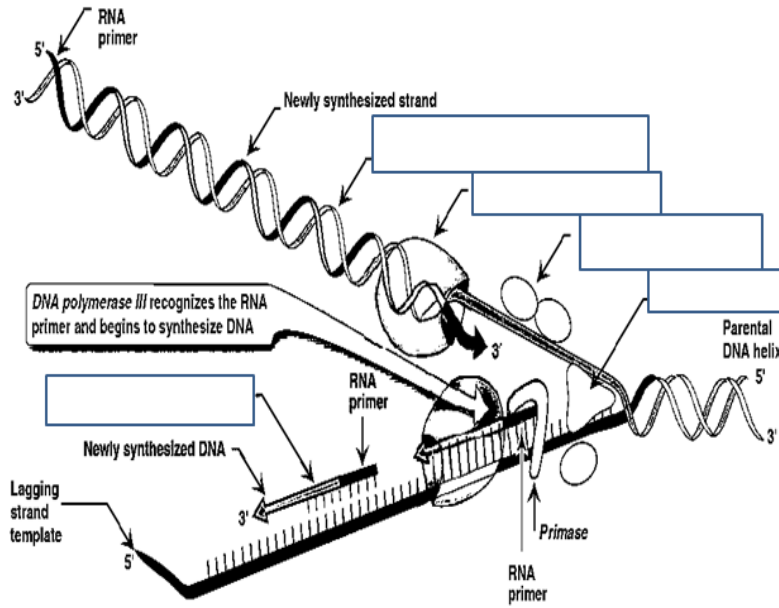
	<p>Linoleic acid</p>
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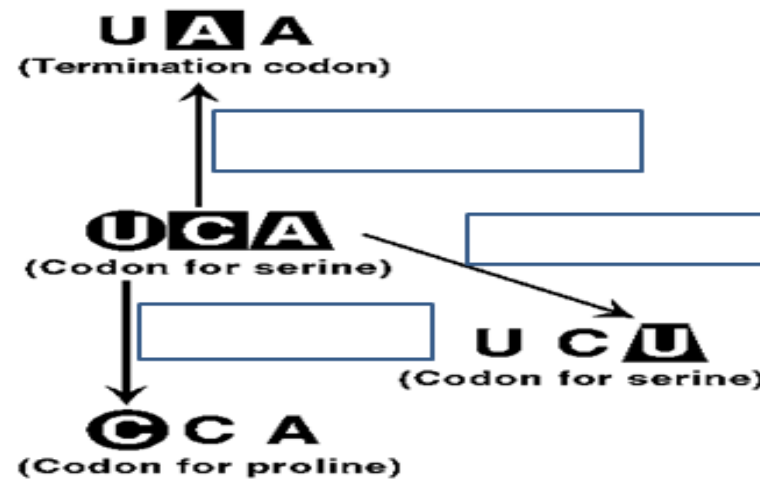


Question (4) Answer the following questions (A)+(B): (10 Marks)

(A) The following diagram shows the process of DNA replication, fill in the boxes the missing components and write a very short note on the DNA replication.



(B) The following diagram shows the possible effects of changing a single nucleotide base in the coding region of an mRNA chain. Fill in the boxes the name of mutations resulted from these changes and shortly EXPLAIN them.



Question (5) Answer the following questions (A)+(B)+(C)+(D): (10 Marks)

(A)

(B) All eicosanoids are derived from arachidonic acid (20:4($\Delta^{5,8,11,14}$)) have a variety of dramatic effects on vertebrate tissues. Write these effects:

1-	
2-	
3-	
4-	
5-	
6-	

(C) Write differences between DNA and RNA

		DNA	RNA
1-	Strands		
2-	Combination with other molecules		
3-	Pentose sugar		
4-	Sum of nitrogenous bases		
5-	Pyrimidine bases		
6-	Forms		
7-	Modified bases		

(C) The rate of DNA synthesis in a culture of cells could be most accurately determined by measuring the incorporation of which of the following radiolabeled compounds? **Explain your answer ?**

- A. Adenine.
- B. Guanine.
- C. Phosphate.
- D. Thymidine.

(D) How many turns of the fatty acid oxidation cycle are required for complete oxidation of oleic acid (18:1 Δ^1) to acetyl-CoA? And calculate how many ATPs will be produced from its complete oxidation to $\text{CO}_2 + \text{H}_2\text{O}$?

End of Questions
Good Luck