



Biomedical Engineering

Biochemistry  
Course Code : BME 291  
Level : 200  
Allowed Time : 2 hours  
Second Semester 2015 /2016  
Final term exam  
50 marks



Faculty Of Engineering  
04-06-2016

### Biochemistry exam

#### تعليمات

- الإجابة في الأماكن المخصصة فقط في نفس ورقة الامتحان وكل سؤال على حدة.
- ممنوع تكرار أية إجابة أو إعادتها في أماكن أخرى.
- ليست هناك أية فرصة لإضافة ورق زائد.
- الصفحة الأخيرة مسودة ولا يعتد بأي كتابة فيها كإجابة.
- يتكون الإمتحان من خمسة أسئلة ويقع في 8 صفحات بالمسودة وجميع الأسئلة إجبارية.
- ممنوع أية كتابات خارجة عن مضمون الإجابة حتى لا تعرض نفسك للمسائلة القانونية.

#### Directions

- All questions are to be attempted in the same exam papers.
- Answers should be written in the provided spaces.
- Do not repeat any answer in other places.
- No additional Booklets could be provided.
- The last paper is a Draft Paper not to be corrected.
- The exam consists of 5 questions in 8 pages including a draft page.



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**Question (1): Choose the correct answer and write the letter of your choice in the answer table below:**

(7 marks, 1 mark/each)

**1- Oxidation of the first hydroxy group of glucose results in the formation of:**

- a- gluconic acid
- c- glucaric acid

- b- glucuronic acid
- d- galactonic acid

**2- The branched part of starch is known as:**

- a- maltose
- c- amylose

- b- cellibiose
- d- amylopectin

**3- Regarding the biological value, lysine is classified as:**

- a- glucogenic amino acid
- c- both glucogenic and ketogenic amino acid

- b- ketogenic amino acid
- d- essential amino acid

**4- The c terminal of "valyl leucyl glycyl arginine" peptide is:**

- a- valine
- c- arginine

- b- glycine
- d- leucine

**5- An example of nucleoside in DNA structure is:**

- a- adenine and ribose
- c- uracil and deoxyribose

- b- cytosine and ribose
- d- thymine and deoxyribose

**6- Lignoceric acid is an example of fatty acid which contains:**

- a- 1 double bond
- c- 3 double bonds

- b- 2 double bonds
- d- no double bonds

**7- An example of 6C fatty acid is:**

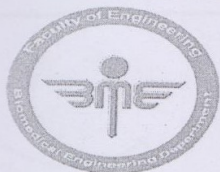
- a- butyric acid
- c- caproic acid

- b- palmitic acid
- d- stearic acid

Question	1	2	3	4	5	6	7
Answer letter							

7





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**Question (2): Choose the correct answer for statements in column A from column B and write the answer letter in answer column:** (14 marks, 1 mark/each)

No	Column A	Answer letter	Column B
1	Branched chain amino acid	A	$\gamma$ -Glutamyl-cysteinyltyrosine
2	Amino acid with hydroxy group	B	lock and key model
3	Amino acid with basic side chain	C	valine
4	The process of releasing neurotransmitters from vesicles	D	zymogen
5	The enzyme molecule changes its shape as the substrate molecules gets close	E	tyrosine
6	Conjugated protein enzymes	F	phenylalanine
7	Materials used in the production of lactose free milk	G	holoenzyme
8	Glutathione	H	cardiolipin
9	Production of unpleasant odour and taste from fats.	I	LDL
10	Good cholesterol	J	exocytosis
11	The protein component of lipoproteins	K	apoprotein
12	Phospholipid containing 3 molecules of glycerol	L	guanine
13	The nitrogen base that bound to thymine in DNA double helix.	M	$\gamma$ -Glutamyl-cysteinylglycine
14	connects all parts of the body and provides support	N	arginine
		O	HDL
		P	rancidity
		Q	connective tissue
		R	plasmalogen
		S	immobilized enzymes
		T	adenine
		U	induced-fit model





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**Question (3): Give the name for each of the followings:**

(16 marks, 1 mark/

No.	Statement	Answer
1	The polysaccharide that contains $\beta$ glycosidic linkage between $\beta$ glucose units.	
2	The optically inactive amino acid.	
3	The disaccharide that is composed of galactose and glucose units.	
4	Sugar isomers that are mirror images of each other.	
5	The gap between different nerve cells.	
6	Protein that is composed mainly of hydroxyproline and hydroxylysine.	
7	Receptors that are responsible for slow-acting neurotransmitters.	
8	The breakdown of the 1ry protein structure.	
9	The number of substrate molecules converted into products per second per enzyme molecule.	
10	Organic molecules that are required by certain enzymes to carry out catalysis.	
11	A molecule is similar to the substrate and competes with the substrate for the active site.	
12	The product of lipid hydrolysis that has detergent action.	
13	The process of margarine production	
14	The RNA type that carries the amino acid to be incorporated into the developing protein.	
15	The substrate concentration at which the reaction velocity is equal to $\frac{1}{2} V_{max}$ .	
16	A group of two or more different types of tissues that work together to perform a specific function.	



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**Question (4): Determine whether the following sentences are correct or wrong and correct underlined words in case of wrong statements:** (7 marks, 1 mark/each)

1- The carboxy group of amino acid remains unionized in alkaline medium.

Answer:

2- All DNA strands are read from the 5' to the 3' end.

Answer:

3- Depolarization has inhibitory effect on nerve impulse.

Answer:

4- The final product of a Metabolic Pathway acts as a noncompetitive Inhibitor to one of the enzymes earlier along the chain.

Answer:

5- The characteristic secondary structure of collagen is  $\beta$ -pleated sheets.

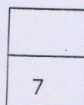
Answer:

6- Excessive increase in temperature decreases rate of enzyme reaction due to saturation of enzyme with substrate molecules.

Answer:

7- The individual phospholipids of cell membrane has two dimensional movement.

Answer:







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**Question (5):**

(6 marks)

**A- Complete the following sentences:**

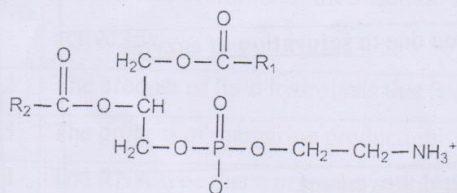
(4 marks, 0,5 mark/each)

- 1- Membrane phospholipid bilayer is composed of a head that is ..... regarding its solubility in water.
- 2- The buffer that maintains membrane fluidity is.....
- 3- At higher temperatures, ..... fats are preferred in cell membrane.
- 4- There are several factors that control rate of diffusion across cell membrane such as ..... and .....
- 5- Solution with concentration greater than that inside the cell is known as.....
- 6- The two types of transport across cell membrane that require transport proteins are..... and .....

**B- Give the name for all the following compounds:**

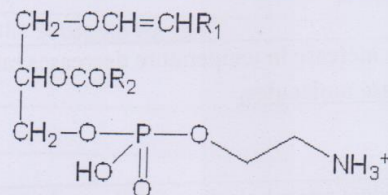
(2 marks, 0,5 mark/each)

1-



Name of the compound:.....

2-



Name of the compound: .....



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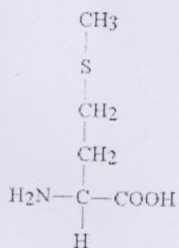
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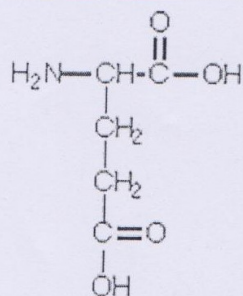
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3-

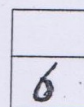


Name of the compound: .....

4-



Name of the compound: .....



End of Questions

*Examination Committee*

Dr. Mohamed El-Mesery