

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 اسئلة ويقع في 7 صفحات بالمسودة وجميع الأسئلة إجبارية.
- ممنوع أية كتابات خارجة عن مضمون الإجابة حتى لا تعرض نفسك للمساءلة 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 7 pages including a draft page.



Biomedical Engineering

Biochemistry
Course Code : BME 291
Level : 200
Allowed Time : 2 hours
First Semester 2018 /2019
Final term exam
50 marks



Faculty Of Engineering
30-5-2019

Part 1

Question (1): Complete the following sentences:

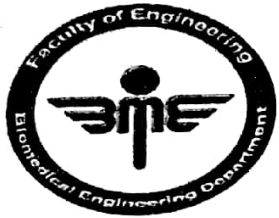
(12 marks, 0,5 mark/each)

- 1- Lactose is composed of glucose and galactose sugar units.
- 2- Dextrins are partial hydrolytic products of starch and they are used in infant feeding and binders.
- 3- The storage form of carbohydrates in animals is Glycogen.
- 4- Amino acids with basic side chains are Lysine and Arginine while the amino acid containing imino group is Proline.
- 5- Valine is classified as essential amino acid while cysteine is classified as Non-essential amino acid regarding their nutritional value.
- 6- Alanine is classified as glucogenic amino acid and leucine is classified as ketogenic amino acid regarding their biological values.
- 7- Oxytocine hormone causes contraction of the smooth muscles of uterus, so used for induction of labor while Vasopressin hormone causes constriction of peripheral blood vessels.
- 8- Naming of polypeptide chain starts from the N-terminal (left).
- 9- α -helix is a rod-like structure of protein and its formation may be disrupted by the presence of Proline (imino group) or aspartic, glutamic (acidic side chain amino acids).
- 10- Interactions stabilizing tertiary structure of protein are hydrophobic interactions, hydrogen bonds, ionic interactions and Covalent cross linkages.
- 11- antibodies. Fibrinogen is an example of protective protein.

Question (2): Give the name of each of the followings:

(6 marks, 1 mark/each)

No.	Statement	Answer
1	Mirror image isomers of the same sugar molecule.	Enoantimers
2	Sugar acid derived from glucose after oxidizing the last CH_2OH group.	glucuronic acid
3	Disaccharide that is composed of glucose and fructose.	Surcose
4	Quaternary structure of protein which consists of two alpha and two beta chains.	hemoglobin
5	The process of un-folding the protein's secondary, tertiary or quaternary structure.	denaturation
6	The overall three-dimensional shape of an entire protein molecule.	tertiary sturctur



Part 2

Question (1): Complete the following sentences:

(13 marks, 0,5 mark/each)

- 1- Neutral fats are formed from alcohol (glycerol) and three molecules of fatty acids combined together by ester linkages.
- 2- Margarine is produced by adding hydrogen to the unsaturated fatty acids and has many disadvantages as doesn't contain essential, and fat doesn't contain soluble and hard to be produced ^{fatty acids} vitamins (A, E, D, K).
- 3- In humans, triglycerides are hydrolyzed to glycerol and free fatty acids (FFA) by lipase enzymes.
- 4- Fats and oils can be protected from rancidity by replace O₂ with N₂ (inert gas) protect them from direct light and put them in vacuum. Add antioxidants ^{materials vitamins}
- 5- Phosphatidic acid is formed from glycerol, 2 fatty acids and phosphate group.
- 6- lecithinase A enzyme causes removal of unsaturated fatty acid from lecithin producing a compound called lysophosphatidylcholine which is haemolytic in action.
- 7- palmitic fatty acid is a saturated fatty acid which contain 16 carbon atoms while stearic fatty acid is a saturated fatty acid which contain 18 carbon atoms.
- 8- Cephalin enter in the formation of cell walls and thromboplastin in the body.
- 9- Chylomicrons (cm) is the first lipoprotein formed that is synthesized mainly from dietary triglycerides in the intestine.
- 10- Low concentrations of high density lipoprotein (HDL) are associated with a higher risk of atherosclerosis.
- 11- Lecithins are formed from glycerol, fatty acid, phosphatic group and Choline (nitrogenous base).



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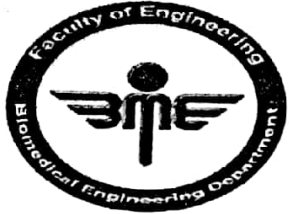
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C - G T - A
 12- Cytosine - guanine and Thymine - Adenine are the two families of nitrogenous bases in DNA.

Question (2): Give the name of each of the followings:

(13 marks, 1 mark/each)

No.	Statement	Answer
1	The substance which is produced in industry by hydrolysis of neutral fats with NaOH.	Soap
2	Simple lipid which contains alcohol higher than glycerol.	waxes
3	The unpleasant odour and taste developed after exposing fats and oils to light, oxygen, moisture and warm temperature.	Rancidity
4	Phospholipid which is formed from 3 molecules of glycerol, 4 fatty acids and 2 phosphate groups.	Cardiolipin
5	A special class of phosphoglyceride in which the fatty acid on the carbon atom number one is replaced by an α - β unsaturated fatty alcohol, forming ether linkage.	plasmalogens
6	Lipoprotein which brings cholesterol to cells throughout your body.	low density lipoprotein (LDL)
7	The name of the sugar which is present in DNA.	deoxyribose
8	The basic proteins which are tightly bound with eukaryotic DNA.	histones
9	Circular rings of DNA that replicate independently of the chromosomes in prokaryotic organisms.	plasmids
10	DNA fundamental structural units that resemble beads on a string.	nucleosomes
11	RNA which carries the amino acid to be incorporated into the developing protein.	transfer RNA (tRNA)
12	The nitrogenous base which replaces thymine (T) in RNA.	uracil (U)
13	The site for protein synthesis.	rRNA (ribosomal) (cytoplasm)



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Question (3): Read the sentences carefully then write (True) if the sentence is correct and (False) if it is incorrect: (6 marks, 0,5 mark/each)

Sentence	Answer
1- Cholesterol is used for synthesis of adrenal cortical hormones, vitamin D3 and bile acids.	True
2- Pure fats and oils have yellow color when they are fresh.	False (colourless)
3- RNA exist as double strand.	False (single)
4- In the DNA double helix, the two backbones run parallel.	False
5- One DNA molecule includes many genes.	True
6- Nucleic acids store, transmit, and help express hereditary information.	True
7- Nucleotide = nucleoside + phosphate group	True
8- Adenine and guanine are pyrimidine nitrogenous bases.	False (purine)
9- Adenine (A) always pairs with cytosine (C), and guanine (G) always pairs with thymine (T).	False $A \leftrightarrow T$ $C \leftrightarrow G$
10- rRNA carries the genetic information from nuclear DNA to the cytosol.	False (mRNA)
11- Nucleic acids are polymers called polypeptides.	False
12- DNA contains 3'-5' phosphodiester linkage.	True