بسم الله الرحمن الرحيم

Sohag University
Faculty of Sciences
Department of Botany
Exam Date: Monday 21/5/2018
Exam Time: 3 hrs. (10AM - 1PM)

Final Exam of Plant Biochemistry (Enzymes) and Virology (302 N)
For 3 rd year students of
Chemistry/Microbiology Program

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Part I (Plant Biochemistry) (82.5 marks)

أجب عن جميع الأسئلة فى ورقة الأسئلة

الرجاء اتباع التعليمات بالنسبة لحجم الاجابة المطلوبة واى كتابة زائدة عن المطلوب لن ينظر اليها - كما يرجى ان تنظم الاجابات بنفس الترتيب وان يكون ترقيمها بوضوح شديد وبنفس طريقة الترقيم بالضبط الذى جاء بورقة الاسئلة تسهيلا للتعرف على الاجابة الصحيحة

QUESTION I – 14.5 marks

Answer the following and do not exceed the asked number of lines

A) How environment controls metabolism of an organisms.(not more than 6 lines) ***(7.5 points)***

B) **Explain how sun light energy operates a biological process in a snake.(not more than 6 lines)** ***(7 points)*****.**

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OUESTION II – 30 marks

Add suitable information in left spaces ***....(30 marks 1 point for each space)***

a) Peptide bond is the bond linking .....during formation of ....., while ..... is the bond linking glucose units in .....

b) Two main characteristics of metabolic processes in all organisms are 1) ..... and 2) .....

c) In catabolism, molecules are ..... into ..... units to ..... and vise versa in .....

d) Enzymes that catalyse the movement of a functional group from one molecule to another belong to class called ..... while those which catalyze the joining of two substrates are classified as .... as in case of joing together of two pieces of DNA

e) In the second step of glycolysis**,** there is an enzyme which catalyses the conversion of glucose-6-hosphate to fructose-6-phosphate. Both glucose and fructose are 6-carbon sugars, but with a different structural arrangement. This enzyme belongs to class **.....** and can be named as .....

f) During enzyme extraction, addition of a detergent in the extraction buffer is not necessary if the enzyme we want to extract is .....

g) Biological molecules present in ribosomes are ..... + ... while those present in cell nucleus are ... . + ... + ...

h) Biological molecules present in the plasmalemma are ..... + ...+ ....

i) Glycoproteins and glycolipids are found in cellular ..... while nucleoproteins are found in cellular ..... and cholesterol can be found in cellular .....

j) ATP and NADH2 belong to the group of biomolecules called ..... while wax and cholesterol belong to the group called .....

k) Biomolecules which function in keeping and transferring genetic information are .... while .... function in energy storing and structural roles.

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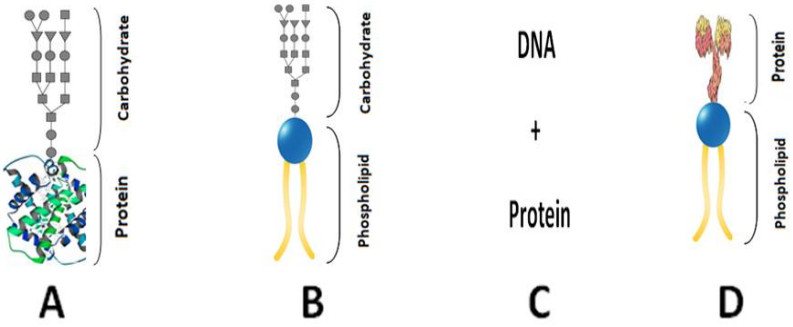
QUESTION III – 18 marks

1) This corresponding figure shows structures of 4 complex biomolecules (A, B, C and D)

Names of these complex macromolecules are ..... in case of (A), ... in case of (B) ..... in case of (C) and ..... in case of (D).



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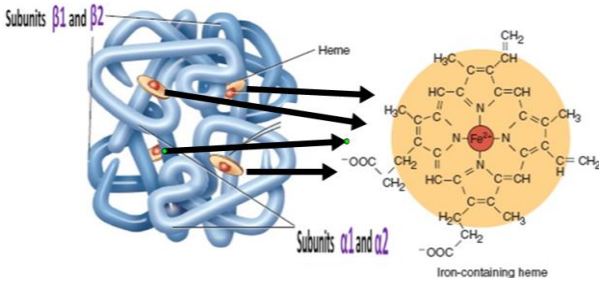
2) This enzyme as shown is composed of 4 protein subunits (α and β) and 4 heme groups (an organic compound with an iron atom Fe):

a) Is this enzyme considered monomeric, dimeric, trimeric or tetrameric or hexameric (.....)

b) It is in (.....) level of protein structure

c) Which part of the enzyme (the protein or the heme) is responsible for the enzyme specificity ....

d) If this enzyme was treated by SDS and put in the SDS-Gel electrophoresis – how many bands result from separation .... why? Because .....



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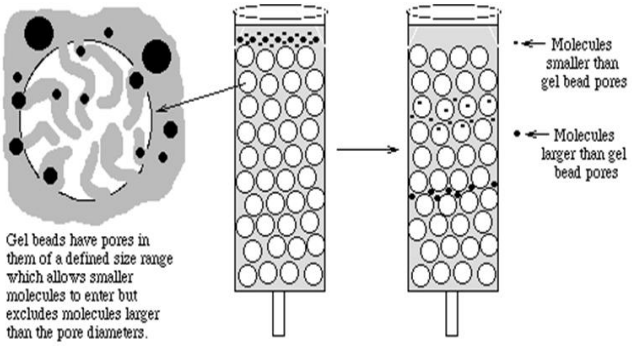
3) The corresponding diagram:

a) shows the method of protein separation called .....

b) In this method, proteins are separated from each other on the basis of their difference in .....

c) Smaller proteins come (first or last) .....



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QUESTION IV – 20 marks

Check TRUE (√) OR FALSE (X) and if False underline the wrong information: .....*(20 marks 2 points / each space)*

1. **Some enzymes are not made totally of pure protein and some enzymes catalyze more than one reaction.**
2. **RNA and DNA can be catabolized to liberate ATP in respiration.**
3. **Monomeric enzymes become active only in the quaternary level of the enzyme structure.**
4. **Diseases happen in many cases when a certain enzyme or protein becomes defective in structure or presence and hence genetic treatment is required to enable cells produce the normal ones.**
5. **The enzyme is said to be conjugated if on hydrolysis yields no organic compounds or metallic ions beside amino acids.**
6. **Various copies of the same enzyme structure (with rearrangement, deletion or addition of very few amino acids), which catalyze the same reaction under different conditions are known as polyzymes.**
7. **Ultrafiltration method employed in separating enzymes from each other is based on the differences of electric charge among enzymes.**
8. **In medicine, some drugs are vitamins needed in enzyme synthesis and some others are enzyme inhibitors or activators of certain enzymes.**
9. **Enzyme is said to be dimeric enzyme if it is composed from one molecule of Vitamin B and the aponenzyme is composed from one protein subunit.**
10. **Determination of specific activity (SA) of an enzyme during its purification is necessary to follow degree of purity. The value of SA becomes smaller as the enzyme preparation becomes more pure.**

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Part II (Virology) (82.5 marks)

Answer all the following questions

I. Choose the correct answer by writing the letter of the correct choice in the answer notebook. (20 marks, 2 mark each)

1. **A lytic infection concludes with the**
   a. .bursting of the host cell
   b. production of messenger RNA
   c. embedding of viral DNA into the host cell's DNA

2. **Why viruses are not considered alive?**
   a. Because they cannot carry out metabolism
   b. Because they cannot undergo mutations
   c. Because they carry genetic information

3. **Which of the following must be made by all RNA virus-infected cells in order for viral progeny to be produced?**
   a. Viral mRNA
   b. RNA complementary to the viral genome
   c. Viral glycoproteins

4. **During latent virus infection**
    a. only a few cells will be producing virus at any time
    b. no infectious virus is synthesized by the infected host
    c. virus replication is held in check by antibodies

5. **The first synthetic process which occurs after infection with a positive strand RNA virus is**
    a. mRNA synthesis
    b. synthesis of RNA complementary to the virion RNA
    c. protein synthesis

6. **Which of the following statements is TRUE about naked viruses?**
    a. Virion proteins appear on the surface of the host cells
    b. Their infectivity is destroyed by lipid solvents
    c. Can stay dry and still retain infectivity

7. **The process by which a virus embeds its DNA into the DNA of the host cell and is replicated along with the host cell's DNA is known as a**
    a. photoheterotrophic
    b. lytic infection
    c. lysogenic infection

8. **What part of the structure of a virus would include phospholipids?**
    a. nucleic acid
    b. capsid
    c. envelope

9. **Viruses cause infection by**
    a. forming endospores in the body
    b. entering body cells and replicating
    c. producing toxins that harm the body

10. **Viruses contain host cell DNA instead of viral DNA within the capsid are called**
    a. satellite viruses
    b. pseudoviruses
    c. incomplete viruses)

II. Complete the missing information:- (20 marks, 2 marks each)

1. _____ describes any virus that can lead to cancer.
2. _____theory states that viruses coevolved with their current cellular hosts.
3. UV rays can damage the virus by creating nucleic acid_____.
4. _____first used the embryonated hen's egg for the cultivation of virus.
5. _____are changes in cells that can be observed microscopically.
6. When_____ are added to infected cells they will appear as rosettes or clumps on the areas where the virus is growing.
7. Infection causes cells to lyse, producing_____ that can be detected visually with dyes.
8. _____is the amount of virus required to kill 50% of host cells.

9. Viruses undergo genetic change by several mechanisms. These include a process called ____________ where individual bases in the DNA or RNA mutate to other bases
10. ____________ refers to the capacity of a virus to cause disease in an infected host.

III. Check true (√) or false (×) and if false rewrite the correct information. (20 marks, 2 marks each)

1. Virus attachment protein is a specific protein on the surface of a virus particle. (   )
2. Abortive infection can result from a non-permissive host-cell. (   )
3. Satellite nucleic acids are more complex than satellite viruses. (   )
4. Enveloped viruses need to kill cells in order to spread. (   )
5. Primary cell culture is not useful for vaccine production. (   )
6. The Influenza virus causes has DNA as its genetic material. (   )
7. Enveloped viruses can survive much longer in the environment than naked viruses. (   )
8. Prions are insensitive to nucleic acid digesting enzymes (RNAse and DNAse). (   )
9. Some viruses, when exposed to a low pH, will denature spontaneously. (   )
10. Incubation with formaldehyde partially modifies the antigenic structure of some viruses. (   )

IV. Answer the following questions:- (22.5 marks, 7.5 marks each)

1. List at least three diagnostic tests used to detect viroids?
2. How is viral growth detected in embryonated eggs?
3. Describe the structure of the capsid and explain how it determines the shape of the virus?

,, Our best wishes ,,

Dr. Ahmed M. Abdelmottaleb Mazen
Dr. Bahig Ahmed Ali
Dr. Abdel Naser Galal

الورقة الخامسة والاخيرة

ورقة الاسئلة متشتملة على 5 صفحات