المستوى الرابع - ميكروبيولوجيا - أجهزة وتقنيات ميكروبيولوجية م ٤١٢

Mansoura University
Faculty of Science
Botany Department
El-Mansoura, Egypt

جامعة المنصورة
كلية العلوم
قسم النبات
المنصورة - مصر

Final Examination in Botany
Second Term: Jun. 2012

Educational Year: Fourth Level **Program (Branch): Microbiology**
Subject: M (412) **Course(s): Instruments & microbial techniques**

Time: 2 hrs **Date: 30/ 6 /2012** **Full mark: 60** **Question mark: 20**

Answer the following questions:

Q.1.Choose the most correct answer(s)(20 marks)

1- In replication of DNA, the helix is opened and untwisted by.....

a- ribase b- ligase c- helicase d- polymerase

2-Which strand below would make the sequence 5' AAACGCTT 3' a double stranded DNA molecule?

a-5' TTTGCGAA 3' b- 5' UUUGCGUU 3' c-5' AAGCGUUU 3' d-5' AAGCGTTT 3'

3-Energy is required to break the hydrogen bonds holding the bases together. Which pair will be the most difficult to separate?

a- A – T b-C-G c-A-C d-G-T

4-The number of amplified pieces of DNA equals.....after five cycles of PCR.

a-5 b-10 c- 25 d-32

5-Place in order the following steps involved in PCR:(1) newly synthesized strands act as templates(2) temperature lowered; DNA primers and polymerase added(3) heat separates strands of target DNA(4) complementary base pairing between primers and template(5) DNA nucleotide bases added; new strand synthesized.

a-1 - 2 - 3 – 4 b-3 - 5 - 4 - 2 - 3 – 1 c-3 - 2 - 4 - 5 - 3 – 1

d-2 - 3 - 4 - 5 - 2 – 1

6- DNA polymerases.....

a- join DNA fragments **b- synthesize DNA in 5'->3' direction**

c- require ATP **d- replicate DNA**

7- The rate of migration of DNA within an agarose gel in the gel electrophoresis technique is primarily based on what factor?

a- The size of the DNA fragments **b- The size of the wells of the gel**

c- The negative charge of the DNA **d- The volume of the DNA sample loaded**

8- Which of the following statements regarding the polymerase chain reaction is untrue?

a- It can increase the amount of DNA in a sample

b-It has the potential of diagnosing an infection from a single copy of a gene

c-It utilizes DNA polymerases from psychrophilic organisms

d-It essentially mimics DNA replication as it occurs naturally

9- DNA replication is called semi conservative because ..... of the original duplex appears in the duplex formed in replication.

a-none b- most c-half d-all

10- During your work, you isolate a previously unknown bacterium. Analysis of its genome reveals that it is composed of a double stranded DNA molecule containing 14% T (thymine). Based on this information, what would you predict the %C (cytosine) to be?

a-14% b-28% c-82% d- Cannot be determined from the information given

Q.2.

(A) Answer each of the following questions as requested?(10 marks)

1-Describe the manufacturing process of penicillin's with special reference to

starter culture , medium design , physical requirement of starter , downstream processing & significance. (4marks)

2- What are Fluorescent dyes? Briefly state the role of Eva Green & quenching molecule during RT PCR reaction.(3 marks)

3-Temperature gradient gel electrophoresis technique(TGGE) can be used to detect the similarity percent between different micro flora. Explain this statement. (3 marks)

(B)complete each of the following sentences. (10marks)

1-DNA sequencing is .....

2-The major steps involved in DNA microarrays are ....., ..., ... & .....

3-The purposes of use in gel documentation system are ....., ... & .....

4-The DNA .....can be cut out of the gel after electrophoresis & can then be .....to retrieve the purified DNA.

5-DNA sequencing techniques is based on ..... & .....

Q.3.Write short notes on each of the following.(20 marks)

1-Microarray production process.

2-Automated DNA sequencing.

3-The procedures of gel documentation system for visualization of electrophoresed macromolecules.

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Microbiology
Program

جامعة المنصورة
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برنامج الميكروبيولوجي

Final Examination
Second Term: May 2012

Educational Year: Fourth Level			**Program (Branch): Microbiology**
Subject: M 411	**Course(s): Genome and Biosafety**		
Time: 2 hrs	**Date: 09/06 /2012**	**Full mark: 80**	**Question mark: 20-30**

Answer the following questions:

Q-1- **Answer with either T (for true) or F (for False), if F why? (20 points)**

1. The Biosafety & Biosecurity Program has developed to ensure the safety of individuals involved with research at research laboratories and to protect the environment.
2. Safety in biomedical research is an exercise in recognizing what the risks are and then introducing procedures, practices, equipment, and facilities to control the identified risks or reduce them to acceptable levels.
3. Technology is advancing so rapidly that it is not possible for safety specialists to anticipate each use of potentially hazardous biological or chemical systems and to monitor, appropriately, every operation that involves these materials.
4. Researchers may not be sufficiently trained to take the necessary precautions to protect themselves, their co-workers, and the environment.
5. Development of Cartagena Protocol Biosafety (CPB) reflected a global climate of concern about the political powers and encouraging the use of genetically modified organisms (GMOs).
6. Developing countries felt very keenly the need to have an internationally binding legal instrument on biosafety, based on the principle of precaution, which would regulate the movement of all GMOs between countries.
7. The Protocol is not perfect because it left some serious flaws and loopholes, particularly relating to the obligation of exporters to provide full information about GMOs and to obtain the full prior informed consent of importing countries for all GMOs.
8. The CPB primarily regulates the transboundary movement - export and import, movement between countries - of LMOs, although its scope extends to the transit, handling, and use of all LMOs.
9. General Lab Requirements are knowledgeable supervisor, knowledgeable personnel and lab specific biosafety manual.
10. Biosafety level 4 is suitable for work with Measles virus, HBV and *Salmonella* that pose a high individual risk and life threatening

	disease.
Q-2-	Pioneer submitted a request for the NBC IN 29-2-2009 for three YGCB hybrids (30K08 BT, white, 30K09 BT, white, 30M84 BT, yellow) with the purpose of cultivation, and use as human food and animal feed (commercialization) in Egypt. The Egyptian Committee for Biosafety has assessed the environmental risks associated with such seeds. What was their conclusion about the potential effects of such crop on non-target organisms? **(30 Points)**
Q-3-	Modern biotechnology means the use of genetically modified organisms generated through recombinant DNA; their usage raises important safety and ethical questions because it may create hazardous new pathogens. Explain the statement and what are governments and regulatory agencies are doing to facilitate the use of biotechnology in agriculture, industry, and medicine while ensuring that new products and procedures are safe. **(30 Points)**
	Examiners: **Prof. Dr.** ***Yehia Abdel-Moneim Osman Ellazeik***

المستوى الرابع - ميكروبيولوجي - أيض ومسارات أيضية م ٤١٠

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جامعة المنصورة
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Final Examination in Botany
Second Term: 2012

Students: 4th Level Microbiology
Time: 2 Hours.
Full mark: 60

Course: Metabolic Pathways (M410)
Date: 12/6/2012
Question mark: 20

Q1: Mention the corresponding name of each process and complete the ractions: (20 Marks)

1- RuBP + O_2 $\xrightarrow[\text{in chloroplasts}]{\text{Oxygenase}}$ .... ⟶ ....

2- $C_6H_{12}O_6$ $\xrightarrow{\text{Lactic acid bacteria}}$ .... + ... + ...

3- $4FeCO_3$ + O_2 + $6H_2O$ $\xrightarrow{\text{Iron Bacteria}}$ .... + ... + ...

4- Sedoheptulose-7-P + GAP $\xrightarrow{\text{transketolase}}$ .... + ...

5- Xylulose-5-P + Erythrose-4-P $\xrightarrow{\text{transketolase}}$ .... + ...

Q2: Discuss briefly each of the following: (20 Marks)

1- Gluconeogenesis .
2- α –Oxidation pathway of fatty acids.
3- Production of succinic acid from pyruvic acid .
4- Relationship between leaf abscission and IAA content.

Q3: Write short notes on : (20 Marks)

1- Bacterial photosynthesis .
2- Different factors affecting respiration.
3- CAM (Crassulacean Acid Metabolism).
4- Oxidative phosphorylation and energy balance.

Best Wishes

Examiner: Prof. S.A.Abo-Hamed

المستوى الرابع - ميكروبيولوجي - دفعة صورية ٢٠١٢

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Final Examination in Botany
Second Term: May 2012

Educational Level: Fourth Level **Program (Branch): Microbiology**
Subject: M (409) **Course(s): Biotechnology**
Time: 2 hrs **Date: 19 / 6 /2012** **Full mark:** 60 **Question mark: 20**

Answer the following questions:

Q1: " A history of Plant Biotechnology from the cell theory of Schleiden and Schwann to biotech crops". Briefly Discuss? (20 marks)

Q2: Give an account of:

"Role of biotechnology in medicinal plants". (20 marks)

Q3: Summarize each of the following:

a- Major types of Biofuels. (10 marks)

b- Ethanol derived from sugarcane and Biomass. (10 marks)

Good Luck
Examiner
Prof. Mohammed Nagib

Examiners: Prof. Mahmoud El-Baz Younis Prof. Mohammed Nagib Abdel-Ghany Hasaneen

ع ميكروبيولوجيا - فسيولوجيا الخلية والتحكم الوراثي ٤٠٨م

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Botany Department
El-Mansoura, Egypt

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Final Examination in Botany Second Term: 2012

Students: 4th Level Microbiology **Course**: Cell Physiology &Genetic Control (M 408)
Date: 05/6/2012 Time: 2 hours. **Full mark: 60**

I-(A) - Compare between the following items (8 marks, each 4 marks)

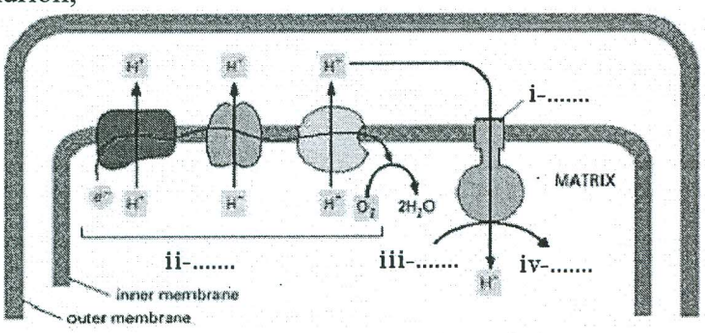
1- Step wise oxidation and sudden oxidation of glucose.
2- Head and tail polymerization.

(B) - Explain the following statements (12 marks, each 4 marks):

1- The ratio between NAD and NADH is kept high (>1) in the living cell.
2- Non-covalent forces are important for normal cellular organization.
3- In the reaction center, light energy captured by chlorophyll creates a strong electron donor from a weak one.

II- Complete the following sentences (20 marks, each 2 mark)

1- Activated carrier molecules enable the enzymes to catalyze ……. Such activated carrier molecules are characterized by i-……., ii-……., and iii-……..
2- The hydrolysis of ATP is an energetically favorable reaction because i-……., and ii-…..
3- ……. is a methyl group carrier and $FMNH_2$ is ……. carrier.
4- The common pathway used by mitochondria, chloroplasts, and ……. to harness energy is called …….—reflecting a link between ……. and ……..
5- In side mitochondrion;



6-Pyruvate dehydrogenase complex is a giant complex of three enzymes i-……., ii-……., iii-……. This complex is decaboxylating pyruvate and the resultant products are NADH, CO_2, and acetyl CoA.
7- DNA replication has 3 steps ……, …….. and ……..
8- Two key classes of regulatory …….. and ……determine a cell progress through cell cycle.
9- Cyclin-dependent kinase inhibitor (CKI) is ……
10- Gene expression can be regulated at many steps in the pathway from …….to……..to……..
11- Expression of a critical gene regulatory……can trigger ……..of a whole battery of downstream gene.

III- Discuss each of the following:

(A) Gel-mobility shift assay can detect sequence specific DNA-binding proteins.

(B) The general scheme of possible post-transcriptional controls on gene expression.

Examiner: Dr. Ashraf Elsayed Dr. Amr Mowafy