Mansoura University
Faculty of Science
Botany Department
Microbiology
Program

جامعة المنصورة
كلية العلوم
قسم النبـــات
برنامج الميكروبيولوجي

Final Examination
Second Term: May 2012

Educational Year: Third Level			**Program (Branch): Microbiology**
Subject: M 311		**Course(s): Microbial Toxins and Water and Air Microbiology**	
Time: 2 hrs	**Date: 11/06 /2012**	**Full mark: 60**	**Question mark: 20**

Answer the following questions:

Q-1-

A- Write a brief note on air as an environment for microorganisms **(4 marks)**

B- Define indicator microorganisms of water quality and enumerate the important pr of an indicator organism; give examples **(10 marks).**

C- Discuss the different methods used for controlling the level of microbial contamination in air **(6 marks)**

Q-2-

Write briefly on:

A- Major steps used in the purification of water **(6 marks).**

B- Air-borne bacterial diseases **(4 marks).**

C- <u>Answer with either T (for true) or F (for False), if F why? (10 points)</u>

1- Anthrax toxin (EF) is an adenylate cyclase enzyme that increases levels in intracellular cyclic AMP in phagocytes and formation of ion-permeable pores in cell membrane.

2- Mycotoxins are extremely stable, the heat and pressure of pelleting and extrusion do not destroy appreciable amounts of mycotoxins.

3- Aflatoxins are metabolized extensively by the liver following intestinal uptake, and the majority of the toxic effects are observed in the liver. The reactive epoxide causes severe hepatocellular necrosis, which leads to decreased liver function.

4- Trichothecene Mycotoxins inhibits protein synthesis, impair DNA synthesis, alter cell membrane structure and function, and inhibit mitochondrial respiration.

5- Aflatoxins B_1, B_2, G_1, and G_2 are relatively similar mycotoxins produced by the fungus *Fusarium sp.* under conditions of temperatures ranging from 38-50°C and 80% moisture in the grain.

Q-3-

<u>Choose the correct answer(s) (2x10= 20 points):</u>

1. **Which of the following statements about bacterial endotoxins is true?**
   A. They usually act at a tissue site in the host that is removed from the site of bacterial growth. B. They are nonantigenic.
   C. They typically have an enzymatic (specific) type of activity.
   D. They can be converted into toxoids. E. none of the above
2. **Bacterial endotoxins and exotoxins both share this property, they are:**
   A. proteins. B. structural components of the bacterial cell wall.
   C. They have an enzymatic type of activity. D. They are toxic to animals.
   E. none of the above
3. **Which of the following statements characterizes the mechanism of action of diphtheria toxin?**
   A. inhibits protein synthesis in susceptible cells
   B. causes an increase in cAMP in cells resulting in severe edema

	C. causes an increase in cAMP in cells leading to diarrhea D. interferes with the transmission of neurotransmitters at stimulatory neuromuscular synapse E. interferes with secretion of neurotransmitters at an inhibitory neural synapse in the central nervous system 4. **Both the botulinum toxin and the tetanus toxin are** A. superantigens B. enterotoxins C. adenylate cyclase enzymes D. Zn++ dependent protease enzymes E. none of the above 5. **The common mode of action of the tetanus and botulinum toxins is to** A. block the release of neurotransmitters across a neural synapse B. up-regulate the production of cAMP in affected cells C. cause the ADP ribosylation of neuron gangliosides D. block protein synthesis in target cells E. cleave neuraminic acid in the intercellular space 6. **The portion of the bacterial lipopolysaccharide (LPS) that is responsible for the toxicity of the molecule is** A. lipid A B. lipoteichoic acid C. O polysaccharide D. Omp A E. N-acetylglucosamine (NAG) 7. **The substrate for the enzymatic (A) component of diphtheria toxin and the cholera toxin is** A. NAD B. cyclic AMP C. ATP D. elongation factor 2 (EF-2) E. the regulatory proteins of the eukaryotic adenylate cyclase complex 8. **The large volume of fluid lost by diarrhea during infection with *Vibrio cholerae*** A. is a consequence of fluid replacement during treatment of the disease and does not result directly from activity of the cholera toxin B. results from electrolytes binding to the intestinal enterocytes which upsets their water retention capability C. is caused when the vibrios bind to the intestinal epithelium and physically or mechanically block the uptake of fluids by the gut epithelial cells D. follows activation of adenylate cyclase by cholera toxin and the subsequent effect of cyclic AMP on water and salt balances of the host cells E. results from neurotoxic effects of the cholera toxin on the central nervous system 9. **The similarity between the toxic shock syndrome toxin (TSST), the staph enterotoxins, and the erythrogenic toxin (pyogenic exotoxin) is** A. they are all produced by *Staphylococcus aureus* B. they stimulate the immune system in a similar manner as superantigens C. the pathology of the diseases that they cause is identical D. they are all neurotoxins E. they are the same (identical) toxin produced by three different organisms **10. Penicillin is an effective antibiotic because of its capacity to bind to:** A. ATP synthase B. endotoxin C. ligase D. permeases E. transpeptidase
Examiners:	**Prof. Dr. *Yehia Abdel-Moneim Osman Ellazeik*** ***Dr. Attiya Hamed Mohamedin***

Mansoura University

Faculty of Science

Botany Department

Date: 18/6/2012

Final Exam for the 2nd Semester 2011/ 2012

Subject: Mineral Nutrition& Plant Hormones (M 310)

3rd level of Microbiology Program

Time allowed: 2hrs

Full Mark : 60 Marks

Answer the following questions:

Question 1. **Explain in details each of the following:** **(20 Marks)**

a- Solution culture as a technique for studying plant mineral nutrition.

b- Transport of mineral nutrients from the soil to root hairs.

Question 2:- **(20 Marks)**

2.A. Write an account on the occurrence, availability,functions and deficiency symptoms of N and P. **(10 Marks)**

2.B. **Complete the missing words in the following:** **(10 Marks)**

1- Hormone is……

2- Cytokinins are mainly responsible for …… and ……

3- Auxin biosynthesis occurs within …… while, cytokinins transport through……

4- Accumulation of abscisic acid induces…….. of leaves and inhibits …… of seeds.

5- Gibberellins acts as a…….. for auxins.

6- Cell elongation induced mainly by ……

7- Coconut milk diffusate is very rich with ……

8- Dwarfism is a simple…… mutant.

P.T. O (من فضلك اقلب الصفحة)

9- Morphogenesis induced mainly by .....

10- Apical dominance is .....

Question 3. **Discuss shortly each of the following:** **(20 Marks)**

a- Auxins biosynthesis.

b- Mode of action of gibberellins.

c- Cytokinins and delay of senescence.

d- Abscisic acid and stomatal closure.

"Best of Luck"

Examiners:

Prof. Dr. Mohamed Abbas **Prof. Dr. Heshmat Aldesuquy**

الفرقة الثالثة ميكروبيولوجي - ٢٠١٢ - علم الإنزيمات - نباتية

Botany Department
Faculty of Science
Mansoura University
May 2012

Year: Third Year Microbiology
Course: Enzymology
Date: 7/6/2012
Time : 2hr
Full mark : 60

Answer the following questions:

Question 1

(A) -Mark each of the following statements with (Yes) or (No): **(10 marks)**

1-Lipase belongs to ligases. (....)
2-Asparagine synthetase is classified under amidases. (....)
3-Urease breaks down urea into $H_2O + NH_3$. (....)
4-Succinate could be converted to fumarate by fumarase. (....)
5-Amylose contains 1,4-linkage and 1,6-linkage. (....)
6-Pyruvic acid could be converted to acetaldehyde by pyruvate carboxylase. (....)
7-Ligases link two molecules in absence of adenosine compound. (....)
8-Decarboxylases belong to ligases. (....)
9-Asparaginase is hydrolytic enzyme. (....)
10-Amylopetin contains little number of glucose units than amylase. (....)

(B)-Write the complete equations and the names of enzymes involved in each of the following reactions: **(10 marks)**

(1) C_4..... $C_3 + C_1$
(2) $C_4 + NADP$.....$NADPH + C1 + C_3$
(3) C_3.....$C_2 + C_1$
(4) $C_4 + H_2O$ .....$C_4 + NH_3$
(5) $C_5 + C_3$ (keto acid) ..... C_5 + C_3 (amino acid)

Question 2

(A): (10 marks)

(1) **Write** the chemical reaction catalyzed by glutamine synthetase.
(2) **What** is meant by isomerase?. Give an example with the enzymatic equation.
(3) **How** could you convert malic acid into C_2 compound enzymatically.

(B): (10 marks)

Complete the following sentences with the suitable word(s)

(1) The only amino acid containing Selenium is..... and its symbol is.....
(2) The source that is used for purification of particular enzyme should be.....,..... and.....
(3) Most enzymes are most stable near physiological pH =.....

Question 3

(A)True or false (10 marks)

(1)-In the homogenization step, the extraction of an enzyme from a plant leaf is done directly in an isotonic solution.
(2)-The velocity of the enzyme reaction depends linearly on the initial substrate concentration.
(3)-Control experiments are very important for correcting the data in enzyme assay experiments.

(B)Compare between the following points: **(10 marks)**

(1) Ion exchange chromatography and hydrophobic interaction as different methods of protein purification.
(2) Continuous assay and end point assay.

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Best wishes

Prof. Hamed M. El-Shora Dr. Amr M Mowafy

المستوى الثالث - ميكروبيولوجي - مقدمة في الميكروبيولوجيا الطبية (٣٠٨م)

Mansoura University Faculty of Science Botany Department Microbiology Program		جامعة المنصورة كلية العلوم قسم النبـــات برنامج الميكروبيولوجي

Final Examination
Second Term: May 2012

Educational Year: Third Level			**Program (Branch): Microbiology**
Subject: M 308		**Course(s): Introduction to Medical Bacteriology**	
Time: 2 hrs	**Date:21/06/2012**	**Full mark: 60**	**Question mark: 20**

Answer the following questions:

Q-1- Four major kinds of human bacterial diseases have been studied extensively.
A. What are these diseases? **(3 points)**
B. How they differ from each other? **(13 points)**
C. How symptoms, syndromes and signs differ from each other? **(4 points)**

Q-2- **D- <u>Answer with either T (for true) or F (for False), if F why? (2x10=20)</u>**

1- Bacteria regulates gene expression in response to environmental factors.
2- Quorum sensing in bacterial responds to changes in intracellular concentration of ion linked which leads to changes in gene expression, e.g. fall in intra-cellular iron levels triggers de-repression of diphtheria toxin gene.
3- Different strains of the same bacterial species differ in their virulence, and virulence can be increased or decreased by the conditions under which the bacteria are cultured or passaged in a living host .
4- Routes of infection of microbial pathogens are Direct or indirect contact, Air-borne transmission, Percutaneous transmission, Food- and water-borne transmission, Insect-borne transmission · Transplacental transmission , Endogenous transmission.
5- 8- Normal flora: Reside in the gastrointestinal, upper respiratory and urogenital tracts and skin. They have a protector and beneficial role. However, they cause disease if they enter sterile sites.
6- 9- Adherence and Invasion are two steps in the virulence process enable bacteria to bind to specific receptors on the tissue and cross mucosal membranes and other tissue barrier to enter normally sterile sites.
7- Indigenous bacteria or normal flora on the various surfaces of the the body are not beneficial to their host.
8- Capsules and glycocalyx protect cells from phagotrophic engulfment and certain host defense mechanisms.
9- Diseases caused by microbes typically are a consequence of either a commensal relationship or the exposure of an organism to a toxic product of a microbe.
10- Opportunistic pathogens such as *E. coli, Pseudomonas or Staphylococcus* cause disease in compromised as well as healthy hosts.

Q-3- **<u>Choose the correct answer(s) (2x10= 20 points):</u>**

1- **Stealth mechanism is the ability of microbe to evade the host systems by:**
a- inhibition of phagocytosis, b- evading phagocytosis,
c- inactivation complement system and antibodies,
d- hiding within host cells.

2- Virulence is:
a- a multifactorial and multidimentional process b- needed to colonise and/or damage tissues c- needed to distinguish pathogen from commensal
d- expressed or essential in vivo, but not in the lab

	3- **A potential pathogen being clinically significant, if:** a-Isolated in abundance, b- Isolated in pure culture c-Isolated on more than one occasion d- Isolated from deep tissues e- Evidence of local inflammation f- Evidence of immune response to pathogen g- Fits with clinical picture **4- A given pathogen causes a specific disease, if:** a. Recognised syndromes appear on the patient b- patient's clinical condition c. potential pathogen isolated from or detected in clinical samples d. They are never be part of the normal flora but may cause subclinical infection. **5- The streptococcal invasin which behaves as a "spreading factor" by breaking down the framework of connective tissues is called** A. collagenase B. streptokinase C. streptolysin D. erythrogenic toxin (pyogenic exotoxin) E. hyaluronidase **6- The "symbiotic" relationship between the *Corynebacterium diphtheriae* and its host is best described as:** A. mutualistic B. parasitic C. commensal D. normal flora E. synergistic **7- Bacteria are generally more susceptible to antibiotics:** A. when the cell wall is absent B. during the lag phase of growth C. during the log or exponential phase of growth D.during the stationary phase of growth E.following endospore formation **8- The bacterial capsule:** a. is involved in motility b. determines the cell's shape c. is required for cell viability d. is always protein in nature d. may contribute to a cell's pathogenicity **9- Which of the following toxins are carried on bacteriophage:** a. Diphtheria b. Botulism c. Scarlet fever d. *E. coli* 0157:H7 **10- The term invasiveness, as it relates to bacterial pathogenesis, refers to** A. ability to colonize a host tissues B. resistance to host immune responses C. resistance to host phagocytic processes D. production of extracellular substances that attack host cells and tissues E. all of the above
	Examiner: Prof. Dr. *Yehia Abdel-Moneim Osman Ellazei*

٣ ميكروبيولوجي - الأغذية والألبان ٢٠١٢

Mansoura University
Faculty of Science
Botany Department
Mansoura, Egypt

جامعة المنصورة
كلية العلوم
قسم النبات
المنصورة - مصر

Final Examination in Botany
Second Term: June. 2012

Educational Year: **3rd Level** Program (Branch): **Microbiology**
Subject: **(M. 307)** Course: **Food Microbiology**
Time: **2 hrs** Date: **14 / 6 /2011** Full mark: **60** Question mark: **20**

Answer the following questions:

1- Question one

a- **Outline** stages of microbial succession involved with sauerkraut production and explain this method of food preservation. (10 marks)

b- **Analyze** chemical changes caused by microorganisms in foods. (10 marks)

2- Question Two

Discuss each of the following:

i. Principles of food preservation. (8 marks)
ii. Chemical spoilage of canned foods. (8 marks)
iii. Effect of water activity on microbial growth in foods. (4 marks)

3- Question Three

Classify and discuss the biological spoilage of canned foods. (20 marks)

Examiners: **Prof. Anwar Mankareous** **Ass. Prof. Dr. Mervat H. Hussein**
Ass. Prof. Dr. Hoda Soliman Dr. Doaa Darwish

Mansoura University
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جامعة المنصورة
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Final Examination in Botany
Second session, June, 2011

Educational Year: Third level. **Program (Branch): Microbiology**
Subject: M 306 **Course:** Algae and Physiology of Algae
Time: 2 hrs **Date: Saturday, 4 /6 /2012** **Full mark:** 60 **Question mark: 20**

Answer the following questions:

Question 1- Answer the following as requested, in the table specified for answer:

True or False : 8 marks

1- Amphitrophy –as mode of nutrition in algae- mean the requirement of some algae to external supply of vitamins and growth substances.

2- Cyanobacterial cell wall consists mainly from peptidoglycans and not from cellulose.

3- Regarding their habit, *Microcystis* represent a regular colony while *Merismopedia* represent an irregular colony.

4- In Chlorophyceae, biliproteins are present only in few orders such as Cladophorales.

Choose the correct answer : 5 marks

1- Which of the following algae is heterotrichous:

a- *Prototheca.* b- *Euglena.* c- *Draparnaldia.*

2- *Nitella* belong to: a- sub-division: Mesokaryotic phycophyta.
b- class: Charophyceae. c- class: Prokaryotic phycophyta.

3- Epitheca, hypotheca, cingulum and sulcus are cellular structures in:

a- Dinoflagellates. b- Diatoms. c- Blue green algae.

4- *Batrachospermum* is the red algae belong to order:

a- Gracilariales. b- Bangiales. c- Lemaneales.

5- Chloroplasts of Ulothrix are :

a- Ripon shape. b- Star shpe. c- Girdle shape.

Complete : 7 marks

1- The following are examples of class cryptophyceae: a- …….. . b- …….. .
2- The basic stages of algal photosynthesis are:
a- …….. b- …….. c-……..
3- Usually, isolation of algae carried out by :
a- …….. b- ……..

True or False				Correct answer					Complete		
1	2	3	4	1	2	3	4	5	1	2	3
									a- b-	a- b- c-	a- b-

Question 2- Describe the habitat, structure, reproduction and life cycle of *Chlamydomonas* .

Question 3- a- Draw with labels cyanobacterial cell structure.

b- What are the importance of algal cultivation?.

Examiners: 1- Dr. Abdel-Rahman I. Soliman.* 2- Prof.Dr. Yehya Azab

Best Wishes for Success Dr. Abdel_Rahman Soliman