

Faculty of Science Botany & Microbiology Department		كلية العلوم قسم النبات والميكروبيولوجي
Food Microbiology(498B) Time: Two hours Total degree: 50 marks	Summer semester exam - the academic year 2015/2016 Fourth Level Exam date: Friday, 24/08/2016	

Answer all the following questions:

The first question: Write short notes about five only of the following: (15 marks)

1. *Salmonella* foodborne infection
2. Indicators of Microbial Food Spoilage
3. Food-borne Intoxications
4. Inhibition principle in food preservation
5. Control of microorganism in food by cleaning and sanitation removal
6. The principles of Hazard Analysis Critical Control Points

The second question: Compare between three only of the following: (6 marks)

1. Vacuum packaging and gas flushing
2. Nitrite and H_2O_2 as antimicrobial agents
3. Neurotoxin and enterotoxins
4. physical and chemical spoilage

The third question: choose the correct answer (4 marks)

1. Which of the following toxin causing botulism is less toxic to human beings?
1. Type A 2. Type B 3. Type C 4. None of these
2. The staphylococcal intoxication refers to presence of
1. An enterotoxin 2. Neurotoxin 3. Mycotoxin 4. All of these
3. A bacterial food intoxication refers to
1. illness caused by presence of pathogens
2. food borne illness caused by the presence of a bacterial toxin formed in food
3. both (a) and (b) 4. none of the above
4. The method of successful treatment of botulism prior to appearance of botulism symptoms involve administration of
1. antibiotic 2. Analgesic 3. Antitoxin 4. antipyretic

Good luck

Dr./ Amal Danial

باقى الأسئلة بالخلف

The fourth question: Put (✓) or (X) of the following and correct the wrong one (Five only) (5 marks)

1. Many microbes produce different types of flavor such as pyrazines "roasted nutty flavors" which produced by *Bacillus subtilis*. ()
2. Slime producers are species from *Xanthomonas*, *Leuconostoc*, *Alcaligenes*, *Enterobacter* because they synthesize acids. ()
3. Some bacteriophages can cause fermentation failure such as in case of lactic acid bacteria. ()
4. Coliforms are used as an index of sanitation including species from *Escherichia*, *Enterobacter*, *Citrobacter* and *Klebsiella*. ()
5. Dextran, is an Exopolysaccharide produced by *Leuconostoc mesenteroides* when growing in sucrose, and used as a stabilizer in ice cream and confectioneries. ()
6. Thermotolerant bacteria have ability to survive pasteurization temperature treatment. ()

The fifth question: Discuss the following items: (12 Marks)

- A. Reduction of microorganisms in contaminated food from air.
- B. Effect of water activity on microbial growth and food production.
- C. Microbial proteins and their application in food industry.

The sixth question: Write short notes on two only of the following: (8 Marks)

- A. The influence of redox potential and oxygen presence on food industry.
- B. Microbial enzymes in food processing.
- C. Beneficial microbes used in yogurt industry.

Good luck
Dr. Elhagag A. Hassan



Assiut University
Faculty of Science
Botany & Microbiolog Dept.

Date: Aug. 28, 2016
Time allowed: 2 hour
Total marks: 50



Second Semester Final Examination Course: 494 B
Examiners: Dr. Nermien H. Seddek & Dr. Asmaa M. M. Mawad

General instruction: Answer All Questions (A, B, C, D and E):

First Part (25 marks):

A- Complete ONLY 5 of the following sentences: (10 marks)

- 1- is represented by the nematodes and snails.
- 2- Air is an environment for microorganisms, in which they can.....
- 3- Biological aerosols as a human hazard source as
- 4- Predation is.....
- 5- Method which use an aspirator to suck in a given volume of air, passing it through a sterile absorbing substance and transferring microbes onto the appropriate medium called
- 6- Edaphon is defined as.....

B- Mention in details the two basic mechanisms which remove aerosols from the inhaled air, support your answer with diagrams. (10 marks)

C- Write on the role of solar radiation and temperature on survival of bio-aerosol (5 marks)

Good Luck ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,, Dr. Nermien Helmy

باقي الأسئلة في الصفحة التالية

D- Put (✓) or (X) at a suitable position only 15 of the following: (15 marks)

- 1- Heat-loving microorganisms have saturated fatty acids to overcome high () temperature.
- 2- Microorganisms could be classified into acidophilic, alkaliphilic and () neutrophilic according to their salt requirements.
- 3- Fungi represent the highest number of microorganisms that occupied the () cultivated soils followed by bacteria and then algae
- 4- Bacteriophage is an example of commensalism relationship. ()
- 5- The hydrolytic breakdown of protein into amino acid is called protein () consumption.
- 6- The total above-ground portions of plants as habitat for rhizosphere () microorganisms
- 7- Mutualism is obligatory relationship between microorganisms while synergism () is not obligatory.
- 8- Sulfate reducing bacteria convert sulfate to sulfide under anaerobic condition. ()
- 9- The conversion of atmospheric nitrogen to ammonia is called ammonification () process.
- 10- *Azospirillum* is a bacterial genus used as a biofertilizers. ()
- 11- *Giardia* is an air borne pathogen that causes Giardiasis disease. ()
- 12- Strigolactones secreted by the roots of leguminous plants that lead to the () formation of root nodules.
- 13- Benthos provides a crucial source of food to many large aquatic organisms. () They are passively float in the water
- 14- Nitrogen fixation may occur non-symbiotically by *Azolla* sp. ()
- 15- Traizines is the most common pesticide used to control the cotton pests. ()
- 16- Gibberellines produced by some species of bacteria is considered plant growth () hormones.

E- Discuss the following (answer about 5 only) (10 marks)

1- Phosphate solubilizing bacteria	4- Formation and degradation of humus
2- Periphyton as a group of water microbiota	5- Sulfur cycle
3- Autochthonous and allochthonous	6- Factors affecting on soil microorganisms

Best wishes and Good luck
Dr. Asmaa M. M. Mawad

	Final- Term Exam 2016	
Botany & Microbiology Department	Plant tissue culture (454 B) Credit hours	Time: 2 hours

Q1) a. Choose the correct answer: (15 Marks)

1- To produce plants that are homozygous for all traits, the best choice is

- a) Cell suspension culture
- b) Callus culture
- c) Anther / pollen culture
- d) Plant organ culture
- e) Protoplast culture

2-The fastest way to a ripe tomato using tissue culture is by

- a) Anther / pollen culture
- b) Plant organ culture
- c) Protoplast culture
- d) Callus culture
- e) Cell suspension culture

3- A(n) _____ is an excised piece of leaf or stem tissue used in micropropagation.

- a) Microshoot
- b) Medium
- c) Explant
- d) Scion

4- Protoplasts can be produced from suspension cultures, callus tissues or intact tissues by enzymatic treatment with

- a) Cellulolytic enzymes
- b) Pectolytic enzymes
- c) Both cellulolytic and pectolytic enzymes
- d) Proteolytic enzymes

5- In plant tissue culture, which of the following shows totipotency?

- a) Meristem
- b) Sieve tube
- c) Xylem vessel
- d) Collenchymas

6- The culturing of cells in liquid agitated medium is called

- a) Liquid culture
- b) Micropopagation
- c) Agar culture
- d) Suspension culture

7- The production of secondary metabolites require the use of

- a) Protoplast
- b) Cell suspension
- c) Meristem
- d) Auxillary buds

8- Variation in in-vitro culture is called as

- a) Invitro variayion
- b) Mutation
- c) somaclonal variation
- d) all of these

9- Which of the following is best suited method for production of virus free plants

- a) Embryo culture
- b) Meristem culture
- c) Ovule culture
- d) Anther culture

10- A major application of embryo culture is in

- a) Clonal propagation
- b) Production of embryoids
- c) Overcoming hybrisation barriers
- d) Induction of somaclonal variations

11- Hormone pair required for a callus to differentiate are

- a) Auxin and cytokinins
- b) Auxin and ethylene
- c) Auxin and abscissic acid
- d) Cytokinins and gibberellins

12- The problem of necrosis and gradual senescence while performing tissue culture can be overcome by

- a) Spraying auxins
- b) Spraying cytokinins
- c) Suspension culture
- d) Subculture

13- DMSO (Dimethyle sulfoxide) is used as

- a) Gelling agent
- b) Alkayting agent
- c) Chelating agent
- d) Cryoprotectant

14- Callus is

- a) Tissue that forms embryo
- b) An insoluble carbohydrate
- c) Tissue that grows to form embryoid
- d) Un organized actively dividing mass of cells maintained in cultured

15- In tissue culture medium, the embryoids formed from pollen grains is due to

- a) Cellular totipotency
- b) Organogenesis
- c) Double fertization
- d) Test tube culture

16- Most plant tissue cultures are initiated from

- a) Calluses
- b) Explants
- c) Plantlets
- d) Protoplasts

b. Define five only:

(5 Marks)

- a) Cell-totipotency
- b) Homozygous
- c) Germplasm
- d) Explants
- e) Callus
- f) Cybridization

Q2) Write note on five of the following:

(15 Marks)

- a) Production of synthetic seeds
- b) Production of virus free plants
- c) Fasciation and tissue proliferation
- d) Vitrification of tissues
- e) Microspore culture
- f) Applications of somatic hybridization

Q3) Explain four of the following:

(15 Marks)

- a) Callus - de-differentiation and cell division
- b) Usefulness of suspension cultures
- c) Browning of cultured tissues
- d) Epigenetic changes and somaclonal variation
- e) Conservation of germoplasm

Good luck

Dr. Abeer Radi & Dr. Fatma Farghaly

Faculty of Science Botany & Microbiology Department	 	كلية العلوم قسم النبات والميكروبيولوجي
Food Microbiology(498B) Time: Two hours Total degree: 50 marks	Second semester exam - the academic year 2015/2016 Fourth Level Exam date: Thursday, 16/06/2016	

Part I

Answer Five Only of the following questions: (5 marks for each)

- 1- Discuss the food-borne intoxications and the general characteristics of food poisoning.
- 2- Give short notes on categories of immobilized enzymes (with drawing).
- 3- Illustrate the considered factors in selecting a microbial or its metabolite (chemical) indicator for a product.
- 4- Write on water activity and its influence on microbial growth in food.
- 5- Account the important factors in microbial food spoilage.
- 6- Define Only Five terms of the following:

Probiotic – Sanitation – Coliforms – Fastidious - Southern blot – Native microflora – Genotype.

Good Luck ☺
Dr. Khalid A. Hussein

باقى الأسئلة بالخلف

Part II

The first question: Write briefly about **three only** of the following: (15 marks)

- a) Bacteria as important microbes in food
- b) Killing principles of Food preservation
- c) Salmonellosis as food- borne illness.
- d) Control of food spoilage by modified atmosphere

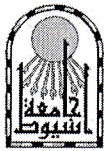
The second question: compare between **two only** of the following: (6 marks)

- e) Canning and cooking
- f) Freezing and refrigeration.
- g) H₂O₂ and epoxides as antimicrobial agents

The third question: place the sing (✓) in front of write sentences and (x) in front of wrong one, and then correct the wrong one: (4marks)

1. Endospore forming organisms can survive cooking and in some cases canning processes.
2. When food is ingested, the toxin is responsible for illness not organism.
3. Toxin produced by *Staphylococcus aureus* is heat stable and not inactivated by cooking.
4. Food borne infections tend to have long incubation periods and are usually characterized by fever.

Good luck
Dr/ Amal Danial

	Second semester Final exam. (2015-2016) Ecology of Xerophytes and Halophytes (Code : 442 B)		
Botany and Microbiology Department	For Under Graduate students Date: 11/6/2016	Time allowed 2 hours	Assiut University

Answer the following questions 50 marks

I. Write in details about four only of the following..... (4×5=20 marks)

1. Egypt can be divided into two hyperarid and two arid provinces; describe this statement from your study with a diagrammatic map.
2. Classify the adaptation types by which plants survive in regions subject to drought.
3. Photosynthesis in water stressed plants with examples to C4 and CAM plants.
4. Sugars, proteins and free amino acids as compatible osmotica.
5. Classification of halophytes (three only).

II. Shortly explain six only of the following (6×3=18 marks)

1. Ionic osmotic adjustment.
2. The morphological adaptations of roots in xerophytes.
3. The anatomical adaptations in xerophytic stomata.
4. The role played by Absciscic acid in plants under abiotic stresses.
5. Halophytes and salt secreting halophytes in the Egyptian flora.
6. Define the salt secreting halophytes and the salt evasion.
7. Microhairs of Poaceae

III. Compare between three only of the following (3×4=12 marks)

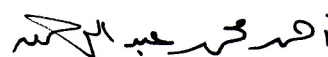
1. Sclerophyllous and malcophyllous xerophytes.
2. Plumbaginaceae and Tamaricaceae salt glands.
3. The roots adaptations of *Anabasis articulata* and *Leptadenia pyrotechnica*.
4. Halophytes and glycophytes.

Best wishes

Prof. Dr. Jaha R. Mohamed



Dr. Ahmed Amro





كلية الزراعة - قسم الوراثة

امتحان الفصل الدراسي الثاني

وراثة العشائر (٤٠٢ ز) - كلية العلوم

العام الجامعي ٢٠١٥ / ٢٠١٦ م

الزمن: ساعتين

أجب عن الأسئلة التالية: -

السؤال الأول: (١٠ درجات)

في إحدى العشائر وجدت الأعداد التالية لمجاميع الدم المختلفة:

A	B	AB	O
486	76	32	502

• احسب تكرار الأفراد الأصلية لمجموعة الدم A والأصلية لمجموعة الدم B.

السؤال الثاني: (١٠ درجات)

بافتراض عدد من الجزر تم الهجرة فيما بينها بمعدل $m = 0.05$ ، وفي إحدى هذه الجزر كان تكرار الأليل A في العشيرة الأصلية 0.4 وتكراره المتوسط لجميع العشائر المهاجرة 0.6 ، فبعد 10 أجيال من الهجرة المستمرة

• ما هو التكرار المتوقع للأليل A؟

السؤال الثالث: (١٥ درجة)

من مصفوفة الجاميطات التالية:

$$g_0 = \begin{vmatrix} 0.3 & 0.1 \\ 0.2 & 0.4 \end{vmatrix}$$

١- احسب قيمة عدم الاتزان الارتباطي D.

٢- احسب تكرار الأليلات لكل موقع.

٣- احسب مصفوفة الجاميطات للنسل الناتج من التزاوج العشوائي وعند الاتزان.

السؤال الرابع: (١٥ درجة)

استقرت مجموعة من الأفراد في إحدى الجزر وكانت تكرارات الطرز الوراثية لصفة الهيموفيليا (سيولة الدم) المرتبطة بالجنس كما يلي:

الإناث			الذكور	
HH	Hh	hh	H	h
0.81	0.18	0.01	1	0
مصاب طبيعي طبيعي طبيعي			مصاب طبيعي	

١- احسب تكرارات الطرز الوراثية بعد جيلين من التزاوج العشوائي.

٢- احسب التكرارات الأليلية عند الاتزان.

محمد



Second Semester Final Examination

Course: 494 B

Examiners: Dr. Nermien H. Seddek & Dr. Asmaa M. M. Mawad

General instruction: Answer All Questions (A, B, C, D,E, F and G):

First Part (25 marks):

A- Choose the Correct Answer ONLY 5 items: (5 marks)

- 1- is represented by the nematodes and snails (Mesofauna – Macrofauna) .
- 2- Air is an environment for microorganisms, in which they can (grow – move – divide) .
- 3- Biological aerosols as a human hazard source as (mycotoxins – pollution – noise) .
- 4- Particular resistance for microorganism relies on (microorganism's morphology – climatic condition – human activities).
- 5- Method which use an aspirator to suck in a given volume of air, passing it through a sterile absorbing substance and transferring microbes onto the appropriate medium called (culture – sedimentation - filtration) method.
- 6- (Competition – Antibiosis - Commensalism) occurs when two populations are striving for the same resource of nutrients or the habitat, the stronger organism excludes weaker one from living space.

B- Identify 2 items ONLY of the following: (4 marks)

Predation	Impact methods	Edaphon
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C- Mention in details the two basic mechanisms which remove aerosols from the inhaled air, support your answer with diagrams. (10 marks)

D- Write on the role of solar radiation, temperature and air pollution on survival of bio-aerosol (6 marks)

Good Luck ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,, Dr. Nermien Helmy

باقى الأسئلة فى الصفحة التالية

Second Part (25 marks):

E- Put () or (X) at a suitable position of **15 items ONLY** of the following:

(15 marks)

- 1- Guilds is metabolically related microbial populations ()
- 2- Microorganisms could be classified into acidophilic, alkaliphilic and neutrophilic according to their salt requirements. ()
- 3- Algae represent the highest number of microorganisms that occupied the cultivated soils. ()
- 4- Synergism is a unidirectional relationship between populations in which one population benefits and the other one is unaffected. ()
- 5- The hydrolytic breakdown of protein into amino acid is called protein assimilation. ()
- 6- Phytase is the main enzyme which makes phosphate available for plants. ()
- 7- Mutualism is obligatory relationship between microorganisms while synergism is not obligatory. ()
- 8- Sulfate reducing bacteria convert sulfate to sulfide under anaerobic condition. ()
- 9- The conversion of atmospheric nitrogen to ammonia by *Rhizobium* sp is called ammonification process. ()
- 10- *Azospirillum* is a bacterial genus used as a biofertilizers. ()
- 11- *Entamoeba histolytica* is water borne pathogen that causes cholera disease. ()
- 12- Flavonoid is secreted by roots of leguminous plants in order to stimulate the sporulation of mycorrhiza. ()
- 13- Plastics and pesticide are considered as xenobiotic compounds which contaminate soil. ()
- 14- Benthos used as an indicator of water quality. ()
- 15- DDT is the most common pesticide used to control the annual grasses. ()
- 16- By decreasing the water content in the soil, the microorganisms decrease. ()

V- Discuss the following (answer about 5 only) (10 marks)

1- Autochthonous and allochthonous	4- Formation and degradation of humus
2- Plant growth promoting rhizobacteria (PGPR)	5- Advantages and disadvantages of microbial remediation of soil
3- Plankton as a group of water microbiota	6- Sulfur cycle

Best wishes Dr. Asmaa M. M. Mawad

Faculty of Science Botany & Microbiology Department		كلية العلوم قسم النبات والميكروبيولوجي
Actinomycetes (472 B) Time: two hours Degree exam: 50 marks	Second semester exam - the academic year 2015/2016 Fourth Division - Faculty of Science Exam date: Thursday, 09/06/2016	

Answer the following questions:

The first question: complete the following sentences: (10marks)

- Actinomycetes grow best under anaerobic or micro-aerophilic conditions with the addition of carbon dioxide
- Antibiotics are chemical substances that or the growth of bacteria or other organisms, such as single-celled protists, or fungi.
- Streptomycin is produced by the soil bacterium called
- Actinomyces* almost commensals in the
- Tetracycline prevents the attachment of to
- The enzymatic reactions leading from N_2 to metabolically useful amino acids are as follows and.....

The second question: Write briefly on five only of the following:

(25 marks)

- Antibiotic produced by *Actinomyces*
- Morphology , epidemiology and culturing of *Nocardia*
- Pathogenic *Streptomyces*
- Symbiotic Nitrogen fixation by *Frankia*
- Thoracic and abdominal actinomycosis
- Mechanism of action of erythromycin

The third question:

(a) Place the sing (✓) in front of write sentences and (x) in front of wrong one, and then correct the wrong one:(4marks)

- In the secondary stage, *Mycobacterium* easily isolated from lung. ()
- Robert Koch was the first to isolate *Corynebacterium diphtheria*. ()
- Corynebacterium* spp. divide by snapping division and binary fission.()
- Puromycin produced from *Streptomyces aureofaciens*. ()

اقلب الصفحة من فضلك

(b) Match each sentence from column (A) with the suitable one from column (B): (5 marks)

(A)	(B)
1. Produce amphotericin B	a. <i>Actinomycesnaeslundii</i>
2. Cause brain abscess	b. <i>Frankia</i>
3. Decay tooth	c. <i>Mycobacterium leprae</i>
4. Make symbiotic with legume plants	d. <i>Streptomyces nodosus</i>
5. Contain waxes with 60 to 90 carbon mycolic acids	e. <i>Nocardia asteroides</i>
	f. <i>Rhizobium sp.</i>

The fourth question:

- (a) Why do bacteria which producing antibiotics do not affect their own growth?(3 marks)
(b) What is the effect of *Streptomyces somaliensis* on the human health?(3 marks)

Good luck

Dr. Amal Danial

Faculty of Science Botany and Microbiology Department		كلية العلوم قسم النبات والميكروبيولوجي
Symbiosis Microbiology (B496) 2 hours 50 Marks		امتحان الفصل الدراسي الثاني العام الجامعي ٢٠١٦/٢٠١٥

First Part

1. Write short notes on: (Answer 3 only)

(9 marks)

- A. Development of intraradical hyphae of AM fungi.
- B. Lichen thallus.
- C. Asymbiotic and presymbiotic stages of AM fungi.
- D. Grouped of mycorrhizal plants.
- E. Types of symbiotic relationship.

2. Discuss the function of the following: (Answer 3 only)

(6 marks)

- A. Spores of mycorrhizal fungi.
- B. Orchid mycorrhizas.
- C. Extraradical mycelium of AM fungi.
- D. Lichen.
- E. Mantle.

3. Differentiate between: (Answer 2 only)

(5 marks)

- A. Foliose and fruticose.
- B. Arbutoid and monotropoid mycorrhizas.
- C. Apothecia and soredia.
- D. Arum and paris type of arbuscules.

4. Put (✓) or (x) and correct the false sentences:

(5 marks)

- A. Root colonization brings the symbiotic interaction and dependent on fungal propagule.
- B. Ericoid mycorrhizal plants involve the colonization of epidermal cells followed by the formation of hyphal complex in each colonized cell.
- C. All fungal species involved in the ectomycorrhiza symbiosis belong to families in the Basidiomycotina.
- D. Fungal associations of Orchid mycorrhizas are essential for plant flowering.
- E. Isidium is a small outgrowth of lichen thallus and mean of asexual reproduction.

With My Best Wishes Dr. Nivien Allam



Second Part

1- Put (✓) or (×) in front of five only of the followings: - (5 Marks)

- A. Rhizobia are a paraphyletic group that fall into one class of the proteobacteria —the alpha-proteobacteria.
- B. When bacterial cells fail to form the peribacteroid membrane in plant cells results in the formation of ineffective nodules.
- C. In *Gunnera* symbiosis with *Nostoc*, the cyanobiont is held intracellularly and the filaments are surrounded by host cytoplasm.
- D. Nitrogen fixation can occur by free-living frankia vesicles.
- E. Bacterioids fix nitrogen which is transferred to plant cells in exchange for carbon from plant in the form of glucose.
- F. *Rhizobium meliloti* colonizes alfalfa root plants.

2- Discuss briefly with drawing the nodulation process in plant root legumes indicating the role and characteristics of nitrogenase complex in nitrogen fixation process. (9 Marks)

3- Answer two only of the following:- (5 Marks)

- A. The function of the following:-
Nod factor – Bacterial rhicadhesin – Leghemoglobin – Coralloid roots
- B. Write on one pathway for non-legume root infection and subsequent nodule development by compatible Frankia.
- C. The anatomical and physiological adaptation of *Azolla* leaf for algal symbiosis and nitrogen fixation.

4- Compare between two only with drawing if possible:- (6 Marks)

- A. Heterocyst and vegetative cells in nitrogen-fixing cyanobacteria.
- B. Determinate and indeterminate root nodules.
- C. Actinorhizal nodules and legume nodules.

Good Luck

Dr. Hagag A. Hassan

Assiut University
Faculty of Science, Botany and Microbiology Department
Second Term Examination: 2015 – 2016
Fourth Level : Special Botany
Subject: Secondary Plant Metabolism (452b)
Time Allowed: 1.5 hours

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Read carefully and choose the right answer for at least 50 questions: (Every question 1 mark)

1- Organic compounds produced by some plants of certain genera and families which are not in mainstream of metabolism and appear to have no direct function in growth and development of plants and appear to have no

direct function in growth and development of plants are called as,

- (a) secondary metabolites (b) secondary plant products
(c) natural products (d) all of above

2. Which of the following are not examples of secondary plant products?

- (a) Fats and hemes . (b) Alkaloids
(c) Lignins and tannins (d) Essential oils, steroids and rubber

3. Secondary plant products are of great importance in commerce in making,

- (a) medicinal drugs (b) poisons (insecticides)
(c) flavours and perfumes (d) all of above

4- Which of the following organic compounds are not plant phenolics?

- (a) Lignins (b) Tannins (c) Essential oils (d) Flavonoids

5- Which of the following pathway is not involved in secondary carbon metabolism in plants?

- (a) Mevalonic acid pathway (b) Pentose phosphate pathway
(c) Malonic acid pathway (d) Shikimic acid pathway

6- The fundamental 5-C unit of terpenoids (i.e., isoprene) has,

- (a) branched carbon skeleton (b) unbranched carbon skeleton
- (c) ringed carbon skeleton (d) none of the above

7- Sesquiterpene contains,

- (a) 10 carbons (b) 15 carbons (c) 20 carbons (d) none of the above

8- Isoprene units are synthesized in plants from acetyl-CoA through,

- (a) malonic acid pathway (b) shikimic acid pathway
- (c) mevalonic acid pathway (d) all above

9- In anthocyanins, the sugars (in the form of one or two glucose or galactose units) are mostly attached to,

- (a) 3rd position of middle ring (b) 7th position of ring-A
- (c) 4 position of ring-B (d) none of the above

10-Characteristic colour of anthocyanins is determined by the presence of - OH groups (and sometimes their methylation) at specific positions in their molecule at,

- (a) ring A (b) ring B (c) middle ring (d) none of the above

11-Most common anthocyanidins in plants are,

- (a) pelargonidin (b) delphinidin (c) cyanidin (d) all of above

12-The colour of delphinidin is,

- (a) scarlet (bright red) (b) crimson (deep red)
- (c) bluish-purple (d) none of the above

13-Besides specific structural features of anthocyanins, the colour of anthocyanin is also influenced by,

- (a) occurrence of different anthocyanins and their association especially at high conc. in the same flower or plant organ
- (b) pH of the vacuole and co-existence of anthocyanins with other flavonoids
- (c) association of anthocyanins with chelated metal ions
- (d) all of above

- 14-Flavones and flavonols differ from anthocyanins in structure mainly in,
 (a) ring-A (b) ring - B (c) middle ring (d) none of the above
- 15-the pigments flavones and flavonols are,
 (a) yellowish (b) ivory coloured (c) colourless (d) all of above
- 16- Isoflavones (isoflavonoids) mostly occur in,
 (a) palms (b) leguminous plants
 (c) cruciferous plants (d) all of above
- 17- Isoflavones differ from other flavonoids in structure mainly in position of ring-B which is shifted from,
 (a) position 2 to position 3 of middle ring (b) position 2 to position 4 of middle ring
 (c) position 2 of central ring to position 5 of ring A (d) none of the above
- 18- Isoflavonoids are known to,
 (a) act as phytoalexins (b) ad as insecticides
 (c) cause infertility in mammals especially sheep (d) all of above
- 19- Rotenone, a widely used insecticide is,
 (a) isoflavnoid (b) sesquiterpene (c) flavonol (d) none of the above
- 20- Gallic acid is chief component of,
 (a) Condensed tannins (b) hydrolysable tannins
 (c) both (a) and (b) (d) none of the above
- 21- Mustard oil glycosides are also known as,
 (a) glucosinolates (b) cyanogenic glycosides
 (c) steroids glycosides (d) none of th above
- 22-A non-protein amino acid which is basic in nature is,
 (a) lysine (b) arginine (c) ornithine (d) histidine

23-Which of the following statements is not correct?

- (a) All organic compounds containing nitrogen and heterocyclic ring are alkaloids
- (b) Alkaloids are bitter in taste and soluble in most of organic solvents
- (c) Most alkaloids are colourless, crystalline non-volatile solids and are optically active
- (d) Many alkaloids exhibit important pharmacological properties.

- 24-Which of the following alkaloids does not contain nitrogen in heterocyclic ring?

- (a) Narcotine (b) Ephedrine (c) Morphine (d) Quinine

25-In plants, alkaloids usually accumulate in,

- (a) young actively growing parts (b) epidermal and hypodermal cells
- (c) bundle sheaths and latex vessels (d) all of above

26- In tobacco plant, nicotine is synthesized in,

- (a) leaves (b) stems (c) roots (d) all of above

27- An alkaloid which is known to inhibit mitotic spindle formation in cells is,

- (a) colchicine (b) coniine (c) quinine (d) none of the above

28- which of the following alkaloids is not synthesized in opium poppy?

- (a) Morphine (b) Thebaine (c) Codeine (d) Atropine

29- An example of indole alkaloids is,

- (a) pilocarpine (b) reserpine (c) papaverine (d) all of above

30- Approximately how many alkaloids have been isolated from plants so far?

- (a) 500 (b) 1000 (c) 2000 (d) 3000

31- Terpenoid containing alkaloids (sterol alkaloids) occur in plants in combination with.

- (a) Carbohydrates (b) Proteins (c) both (a) and (b) (d) none of the above

32-Most important function of alkaloids in plants appears to,

- (a) act as growth hormone (b) provide protection against predators
- (c) to attract animals for pollination (d) none of the above

- 33--Which of the following is not a phenolic compounds?
- (a) Lignins and tannins (b) Flavonoids
(c) ,Coumarins (d) None of the above
- 35- Except flavonoids, all other plant phenolics are biosynthesized in plants through,
- (a) malonic acid pathway (b) mevalonic acid pathway
(c) shikmic acid pathway (d) none of the above
- 36- The basic carbon skeleton of flavonoid is,
- (n) $C_6 - C_3 - C_6$, (b) $[C_6 - C_3 - C_6]_n$ (c) $[C_6 - C_3]_n$ (d) $c_6, - C_2 - C_6$
- 37- which of the following enzymes IS most extensively studied enzyme of secondary metabolism in plants?
- (n) Chalcone synthase (b) Phenylalanine ammonia lyase
(c) Allene oxide cyclase (d) None of the above
- 38- How are flavonoids synthesized in plants?
- (n) By mevalonic acid pathway (b) By malonic acid pathway
(c) By shikimic acid pathway (d) by both (a) and (b)
- 39- Which one of the following is not a simple plant phenolic?
- (n) Caffeic acid (b) Salicylic acid (c) Abietic acid (d) Ferulic acid
- 40- Which of the following is building block of lignins? .
- (a) Coniferyl alcohol (b) Sinapyl alcohol
(c) p-Coumaryl alcohol (d) All of above
- 41- Primary function of lignin• in plants is,
- (a) to provide mechanical support to plant
(b) to provide protection from physical, chemical and biological attack
(c) both (a) and (b) (d) none of the above

- 42- The basic carbon skeleton of lignin is,
 (a) C6 – C3 - C6 (b) (C6 – C3)_n (c) (C6)_n
 (d) (C6 – C3 - C6)_n
- 43- Flavonoids are phenolic compounds that contain,
 (a) 15 - C (b) 10 - C (c) 30 - C (d) none of the above
- 44- Which part of the flavonoid molecule is synthesized through shikimic acid pathway?
 (a) Ring - A (b) Ring - B (c) Ring - A and oxygen of the middle ring
 (d) Ring - Band 3-carbons of the middle ring
- 45- In plants, flavonoids occur as glycosides that are soluble in water and are mostly,
 (a) coloured (b) colourless (c) red coloured .. (d) yellow coloured
- 46- Flavonoids mostly accumulate• in,
 (a) cytosol (b) chloroplast (c) chromoplast (d) vacuole
- 47- Main function of flavonoids in plants is.
 (a) defense (b) pigmentation (c) both (a) and (b) (d) none of the above
- 48- Which of the following compounds are not flavonoids?
 (a) Anthocyanins (b) Flavonols and flavones
 (c) Isoflavones (d) None of the above
- 49- Except in flowers, anthocyanins are never found in plants in,
 (a) fruits (b) stems and leaves
 (c) roots (d) none of the above
- 50- The colour of tomato fruits is due to the presence of,
 (a) anthocyanins (b) carotenoids (c) flavonols (d) none of the above
- 51- The aglycone of anthocyanin which is called as anthocyanidin, is a,
 (a) flavynium cation (b) flavynium anion
 (c) flavin molecule (d) none of the above

- 52-Which of the following is not an important monoterpene component of conifer resins?
- (a) Myrcene (b) Menthol (c) α -Pinene (d) Limonene
- 53-Essential oils such as peppermint oil produced by flowering plants have,
- (a) insects repelling property (b) insects attracting property
- (c) insecticidal property (d) none of the above
- 54-Monoterpene esters called pyrethroids, which occur in leaves and flowers of Chrysanthemum are used on commercial scale in making,
- (a) perfumes (b) medicinal drugs (c) insecticides (d) all of above
- 55- Gossypol, which is found in cotton plants and provides resistance to insects, fungal and bacterial pathogens is a,
- (a) monoterpene (b) sesquiterpene (c) diterpene (d) sesquiterpene dimer Abietic

GOOD LUCK

Prof.Dr. M. A. ZIDAN

Faculty of Science Botany and Microbiology Department		كلية العلوم قسم النبات والميكروبيولوجي
Symbiosis Microbiology (B496) 2 hours 50 Marks		امتحان الفصل الصيفي العام الجامعي ٢٠١٥/٢٠١٦

First Part

1. Write short notes on: (Answer 3 only)

(9 marks)

- A. Development of extraradical mycelium of AM fungi.
- B. Sexual and asexual reproduction in lichen.
- C. Presymbiotic and symbiotic stages of AM fungi.
- D. Grouped of mycorrhizal plants.
- E. Ericoid mycorrhiza.

2. Discuss the function of the following: (Answer 3 only)

(6 marks)

- A. Spores of mycorrhizal fungi.
- B. Orchid mycorrhizas.
- C. Intraradical mycelium of AM fungi.
- D. Lichen.
- E. Mantle.

3. Differentiate between: (Answer 2 only)

(5 marks)

- A. Foliose and fruticose.
- B. Arbutoid and monotropoid mycorrhizas.
- C. Vesicles and auxiliary vesicles.
- D. *Arum* and *Paris*-type of arbuscules.

4. Put (✓) or (x) and correct the false sentences:

(5 marks)

- A. In competition relationship; one species benefits but the other is unaffected.
- B. Mycorrhizae increase nutrient uptake from soil.
- C. In the asymbiotic stage, AM fungal spores are produced in the plant by intraradical hyphae.
- D. Mantel in ectomycorrhizae covers small portions of lateral roots.
- E. Ectendomycorrhizae are associations formed between a limited number of basidiomycetes and conifer genera.

With My Best Wishes Dr. Nivien Allam



Second Part

1- Choose the correct answer (FIVE only):- (5 Marks)

1. Nitrogen fixation can occur by free-living
A. Frankia spores
B. Rhizobia
C. Frankia vesicles
D. None of these
2. Bacteria are chemotactically attracted toward specific plant chemicals exuding from root tissue are called, especially in response to nitrogen limitation.
A. flavonoids
B. Rhichadhesin
C. Lectins
D. All of these
3. colonizes alfalfa root plants.
A. *Rhizobium meliloti*
B. *Rhizobium phaseoli*
C. *Azorhizobium caulinodans*
D. None of these
4. Nitrogen is fixed by bacterioids which is transferred to plant cells in exchange for carbon from plant in the form of
A. Glucose
B. Galactose
C. Malate
D. Citrate
5. is formed when rhizobial cells fail to form the peribacteroid membrane in plant cells.
A. ineffective nodules
B. effective nodules
C. Globose nodule
D. Both A & B
6. Stem nodules were observed primarily with *Sesbania* tropical legumes in association with
A. *Rhizobium meliloti*
B. *Rhizobium phaseoli*
C. *Azorhizobium caulinodans*
D. All of these

2- Write an account with drawing on THREE only of the following:-
(12 Marks)

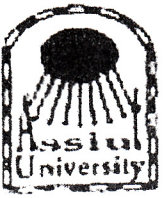
- A. Non-legume root infection by frankia.
- B. Nodulation process in plant root legumes.
- C. Heterocyst in nitrogen fixing cyanobacteria.
- D. *Gunnera* symbiosis with *Nostoc*.

3- Write short notes with drawing on TWO only of the following:-
(8 Marks)

- A. Actinorhizal nodules and legume nodules.
- B. *Azolla* leaf adaptation for algal symbiosis and nitrogen fixation.
- C. Algal coral symbiosis.

Good luck

Dr. Elshagag A. Hassan



Second Semester Final Examination

Course: 494 B

Examiners: Dr. Nermien H. Seddek & Dr. Asmaa M. M. Mawad

General instruction: Answer All Questions (A, B, C, D, E, F and G):

First Part (25 marks):

A- Choose the Correct Answer ONLY 5 items: (5 marks)

- 1- is represented by the nematodes and snails (Mesofauna – Macrofauna) .
- 2- Air is an environment for microorganisms, in which they can (grow – move - divide) .
- 3- Biological aerosols as a human hazard source as (mycotoxins – pollution – noise) .
- 4- Particular resistance for microorganism relies on (microorganism's morphology – climatic condition – human activities) .
- 5- Method which use an aspirator to suck in a given volume of air, passing it through a sterile absorbing substance and transferring microbes onto the appropriate medium called (culture – sedimentation - filtration) method.
- 6- (Competition – Antibiosis - Commensalism) occurs when two populations are striving for the same resource of nutrients or the habitat, the stronger organism excludes weaker one from living space.

B- Identify 2 items ONLY of the following: (4 marks)

Predation	Impact methods	Edaphon
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C- Mention in details the two basic mechanisms which remove aerosols from the inhaled air, support your answer with diagrams. (10 marks)

D- Write on the role of solar radiation, temperature and air pollution on survival of bio-aerosol (6 marks)

Good Luck ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,, Dr. Nermien Helmy

باقى الأسئلة فى الصفحة التالية

Second Part (25 marks):

E- Put () or (X) at a suitable position of **15 items ONLY** of the following:

(15 marks)

- 1- Guilds is metabolically related microbial populations ()
- 2- Microorganisms could be classified into acidophilic, alkaliphilic and neutrophilic according to their salt requirements. ()
- 3- Algae represent the highest number of microorganisms that occupied the cultivated soils. ()
- 4- Synergism is a unidirectional relationship between populations in which one population benefits and the other one is unaffected. ()
- 5- The hydrolytic breakdown of protein into amino acid is called protein assimilation. ()
- 6- Phytase is the main enzyme which makes phosphate available for plants. ()
- 7- Mutualism is obligatory relationship between microorganisms while synergism is not obligatory. ()
- 8- Sulfate reducing bacteria convert sulfate to sulfide under anaerobic condition. ()
- 9- The conversion of atmospheric nitrogen to ammonia by *Rhizobium* sp is called ammonification process. ()
- 10- *Azospirillum* is a bacterial genus used as a biofertilizers. ()
- 11- *Entamoeba histolytica* is water borne pathogen that causes cholera disease. ()
- 12- Flavonoid is secreted by roots of leguminous plants in order to stimulate the sporulation of mycorrhiza. ()
- 13- Plastics and pesticide are considered as xenobiotic compounds which contaminate soil. ()
- 14- Benthos used as an indicator of water quality. ()
- 15- DDT is the most common pesticide used to control the annual grasses. ()
- 16- By decreasing the water content in the soil, the microorganisms decrease. ()

V- Discuss the following **(answer about 5 only) (10 marks)**

1- Autochthonous and allochthonous	4- Formation and degradation of humus
2- Plant growth promoting rhizobacteria (PGPR)	5- Advantages and disadvantages of microbial remediation of soil
3- Plankton as a group of water microbiota	6- Sulfur cycle