	A) True	B) Fa	alse	
2	2. Streptomycin was	the first effective antil	biotic against TB.	
	A) True	B) Fa		
2.	3. Nocardiopsis, an highest IAA produ	endophytic actinobac	terium associated with	mandarin recorded
	A) True	B) Fa	lse	
P	art 2: choose corr	ect answer in the fo	llowing sentences: -(2	1 marks)
			cts of Streptomyces secon	
2.	Vegetative hyphae	of Frankia alni are	in diameter	
		b- 0.5-2.0 μm	c- 5-10 µm	d- 2-5 μm
3.	Streptomycetes mal a- 10%	b- 20%	teria. c- 40%	d- 50%
4.	Rhizospheric actino	mycetes influence plan	at growth directly by	*****
			ation c- siderophores	
5.	Undersoil.	Streptomyces sp. ar	e the numerous microbia	al population in
	a- dry condition conditions	b- alkaline condition	c- moisture condition	d- dry and alkaline
6. 5	Streptomyces are:			
	a- All strict anaer	robes	b- Predominantly found i	n soil
	c- Cell wall type	III	d- 1.5-5.0 pm in diamete	
7. 1	Frankia is responsib	le for of the	biologically fixed nitroge	en in the world
	a-15%	b- 20%	c-30%	d- 40%
8. 7	The first chemical sy	nthesized antibiotic wa	as	
		b- Chloramphenicol	c- Tetracycline	d- Streptomycin

A) True	B) False
11. Streptomycetes need vitami	ns and growth factors.
A) True	B) False
12. Frankia infects the root cell	lls of actinorhizal plants through either intracellular root- llar root invasion.
A) True	B) False
13.Two species of Streptomyco coelicolor are used for inde such as dihydrogranticin	es by the name of <i>Streptomyces</i> griseus and Streptomyces ustrial production of Streptomycin and novel antibiotics
A) True	B) False
14. Siderophores are high mole	ecular weight high affinity iron chelators.
A) True	B) False
15. Doxorubicin as anticancer Secondary metabolites pro A) True	agents and Rapamycin as immunomodulatory agents are duced by <i>Streptomycetes</i> . B) False
16. Streptomyces spp. produce	about 80% of natural antibiotics.
A) True	B) False
17. All Streptomyces sp. are me A) True	esophile B) False
18. Streptomyces is including hyd	droxamate siderophores: desferrioxamines and coelichelin.
A) True	B) False
19. Streptomycetes are not resist A) True	tant to drought and form arthrospore. B) False
20. Tetracyclines bind to the 30 synthesis by blocking the at ribosome.	0s subunit of microbial ribosomes. They inhibit protein ttachment of charged aminoacyl-tRNA to the B site on the
A) True	B) False
21. Frankia strains have been k proteinases.	known to secrete extracellular cellulases, pectinases, and



Assiut University-Faculty of Science- Botany and microbiology department

First semester (2024/2025)-Final exam of Actinomycetes (472 B)

Bachelor's degree (Fourth level) Date: 27/5/2025 Bachelor's degree (Fourth level)

degree: Time: 2 hour



/50

 Actinobacteria is on of bacterial genera, 	e of the dominant bacterial phyla and contains one of the largest Streptomyces.
A) True	B) False
2. Frankia, fixes N in I A) True	egumes under both symbiotic and free-living conditions. B) False
	species are known to be pathogens, in plants, such as mycetoma somaliensis and S. sudanensis B) False
	ds themselves play a more specific and molecular role in the nechanism of nitrogenase.
A) True	B) False
	apable to produce degrade cellulose, lignocellulose, chitin and impounds in biogeochemical cycles.
A) True	B) False
6. Reproductive hyphae	e called spore-bearing mycelium.
A) True	B) False
7. Marine invertebrates novel Streptomecet	s, particularly sponges, are of excessive interest for discovering es.
A) True	B) False
8. The diazo-vesicles ar plant during symbi	e responsible for the supplying of sufficient phosphate to the hososis.
A) True	B) False
9. Streptomyces act as b A) True	iological control of sun flower stem rot and potato common scab

pathways of r	methane formation	one digestion,	particularly in re	lation to the metabolic
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onomic, environmental, and ene	aste into energy is presented as a solution to rgy security challenges. In light of this
stement discuss the following:	
What are the types of biofuel ge	neration, and what are their advantages and
disadvantages?	
disadvantages:	
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. Write an account of the metabolic pathw extraction process for industrial production	ays involved in lactic acid synthesis and the 1.
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3. Metabolic pathway for Streptomycin synthesis
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3.	Biotechnological approaches to improving biofertilizer efficacy
and the state of	
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4.	Molecular signals in <i>Rhizobium</i> -legume symbiosis and structure and function of nodule components
4.	Molecular signals in <i>Rhizobium</i> -legume symbiosis and structure and function of nodule components
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	Types of biofertilizers, their functions, and methods of application	
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	Characteristics and types of carriers used in biofertilizers production	
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Q2. Write an account in Each of the Following:	
1. Properties of microbes involved in antibiotic production	
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14 L.L. lad diagram	
2. The mechanism of action of polymyxin with labeled diagram	neralty.
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Assiut University Faculty of Science
Botany & Microbiology Department Biotechnology program Second Semester-Final Examination



Date: May 26, 2025 The time allowed: 2 hours Total mark: /50 Subject: Industrial Biotech:

BT402

General Instructions: - Answer only five of the following questions in the examination book provided. O1. Place a tick $\sqrt{\ }$ in the correct answer (10 Marks).

Q1. Place a tick V	in the correct answer	r (10 Marks).	
Aminoglycosides a A) Wall-synthesis	ntibiotics act by B) RNA-block	C) Ribosomal-30S	D) DNA-gyrase
A) wall-syllthesis	b) KIVA-biock	C/ Misosomar 303	D) DIVA gyruse
2. What factor is NO	T typically optimized d	uring the fermentation p	rocess?
A) pH	B) Temperature	C) Light	D) Nutrients
3. A glycopeptide and	tibiotic primarily acts b	y inhibiting:	
A) DNA replication	B) Wall- synthesis	C) RNA transcription	D) Protein synthesis
4. Which biofertilize	r is recommended for w	aterlogged soils?	
A) Nostoc	B) Rhizobium	C) Azotobacter	D) Sinorhizobium
5 Which organic ac	id is essential in the ma	king of Swiss cheese?	
0	B) Lactic acid	C) Acetic acid	D) Propionic acid
6. How does Congo r	red identify Rhizobium?		
A) Absorbs-red	B) Changes-pH	C) Excludes-red	D) Kills-bacteria
7. Which organic aci	d is used in the product	ion of biodegradable pla	stics?
A) Citric acid	B) Lactic acid	C) Acetic acid	D) Butyric acid
8. Which organic aci	d is used in the product	ion of effervescent tablet	s?
A) Citric acid	B) Lactic acid	C) Acetic acid	D) Butyric acid
9. What combines wi	ith acetyl-CoA to form o	citric acid?	
A) Pyruvate	B) Oxaloacetate	C) Lactate	D) Ethanol
40 701 .00	DL:	40	
1	legume-Rhizobium is d		D) Elavanaida
A) Ammonia	B) Ureides	C) Amides	D) Flavonoids

21-	Which	of t	he	following	bacteria	is	health	beneficial	in	the	human	colon	?
-----	-------	------	----	-----------	----------	----	--------	------------	----	-----	-------	-------	---

- a- Lactobacillus
- b- Salmonella
- c- Shigella
- - a- anaerobic conditions
 - b- aerobic conditions
 - c- both aerobic and anaerobic conditions
- 23- Any change which makes food unfit for human consumption is called
 - a- processing
 - b- spoilage
 - c- preservation
- 24-The botulinum toxin has been found in a variety of foods, including
 - a- canned food
 - b- sausage
 - c- All of the above
- 25- What bacteria cannot be killed by cooking?

 - a- Bacillus b- Clostridium
 - c- All of the above

- 8- Spoilage of food maintained at refrigeration temperatures occurs by with the ability to multiply at low temperature.
 - a- psychrophilic microbes
 - b- halophilic microbes
 - c- microaerophilic microbes
- 9- Which of the following statements are true about Staphylococcus toxins?
 - a- Heat-stable enterotoxins produced by Staphylococcus aureus
 - b- food poisoning where symptoms have a rapid onset and include nausea, vomiting and abdominal cramping
 - c- All of the above
- 10- Which of the following food preservation methods relies on reducing water activity to inhibit microbial growth?
 - a- Canning
 - b- Freezing
 - c- Desiccation
- 11-What is the primary role of pasteurization in food processing?
 - a- Eliminate all microbes
 - b- Reduce the microbial load without affecting the quality of food significantly
 - c- Preservation of color
- 12-..... is an organic compound used as a food preservative.
 - a- Sorbic acid
 - b- Fructose
 - c- Dextrose
- 13-In food microbiology, what does HACCP stand for?
 - a- Hazard Analysis and Critical Control Points
 - b- High Altitude Cooking and Cooling Process
 - c- Harmful Additives Control and Cleaning Protocol

14- Which of the following is a foodborne pathogen associated with undercooked poultry?

- a- Acetobacter aceti
- b- Streptococcus thermophilus
- c- Campylobacter jejuni

15- Acetic acid can be used for

- a- preservation of color
- b- preservation of pickles
- c- None of the above

16-What is the main function of nitrites in cured meats?

- a- preservation of color
- b- food preservatives that suppress the growth of bacteria, *Clostridium botulinum* in particular where it prevents the germination of *Clostridium* endospores.
- c- None of the above

17- Which of the following is a foodborne pathogen that causes bloody diarrhea?

- a- Lactobacillus acidophilus
- b- Escherichia coli O157: H7
- c- Lactococcus lactis

18- Gamma radiation is used in food industry for

- a- food cooking
- b- food preservation where it penetrates the food, rapidly killing food-poisoning bacteria, harmful parasites, and insects
- c- improving texture

19- Salting is a fundamental method of food preservation where it kills microbes by the process of due to high osmotic pressure.

- a- plasmolysis
- b- turgidity
- c- None of the above

20- At pH most food spoilage bacteria grow.

- a- acidic
- b- neutral
- c- strong alkaline

- 8- Spoilage of food maintained at refrigeration temperatures occurs by with the ability to multiply at low temperature.
 - a- psychrophilic microbes
 - b- halophilic microbes
 - c- microaerophilic microbes
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 - b- High Altitude Cooking and Cooling Process
 - c- Harmful Additives Control and Cleaning Protocol

[Part A]: Choose the Correct Answer for the following questions. (25 points) (Each question worth one mark)

- 1- Which of the following bacteria does not cause food poisoning?
 - a- Staphylococcus aureus
 - b- Acetobacter aceti
 - c- Bacillus cereus
- 2- Microorganisms are used in production of which of the following?
 - a- Alcoholic beverages and Breads
 - b- Fermented dairy products
 - c- All of the above
- - a- 40
 - b- 63
 - c- 37
- 4- The presence of which of the following bacteria is tested in canned foods for evaluating the efficiency of sterilization of these food products?
 - a- Lactobacillus
 - b- Clostridium botulinum
 - c- Streptococcus thermophilus
- 5- Jellies and jams are rarely affected by bacterial action because of high sugar content.
 - a- True
 - b- False
- 6- What is the primary purpose of adding chemical preservatives to food?
 - a- Improving texture and enhancing flavor
 - b- Increasing nutritional value
 - c- Inhibiting microbial growth
- 7- Some food naturally contains antimicrobial substances that inhibit microbial attack. Egg white has which destroy susceptible bacteria.
 - a- Lysozyme
 - b- Lactenin
 - c- None of the above

A Was fille consucrely and agricultural importance of a less was reference
8-Abscisic Acid (ABA) Accumulation?
<u> </u>

With my best wishes

Prof. Dr. Hanaa Kamal Galal

6- Shoot Adaptation (Write 3)?	
7- Different Photosynthetic Pathways (C4 Syndrome CAM Plants C3 plants)?	
······	

3-What are the main mechanisms that halophytes use to adapt to high salinity?
Jacobanda A to confinence some sale voltage
· · · · · · · · · · · · · · · · · · ·
4- What is the commercial and agricultural importance of halophytes, refers to
the main environmental factors affecting halophytes?
the main of the different factors affecting nationally test
5- The difference between Avoidant Plants (arido-active) and Tolerant Plants
(arido-tolerant)?
<u>.</u>

Latex Tubes	8	The presence of storage tissues and mucilaginous substances are characteristic to many fleshy xerophytes.
Geophytes	9	Xerophytes that possess abundant hair on their leaves and stems are commonly callexerophytes.
Drought-Resistant Xerophytes	10	Found in many xerophytic stems and leaves the laticiferous canals are present (e.g. <i>Calotropis, Euphorbia,</i> some members of Asteraceae).

Q3- Write on:	
1- Functions of hairs?	
·	
2- Root Adaptation?	
el and trevaler to a femilia constituent and a c	

9- To cope with strong sunlight, halophytes may:

a- Shed all leaves

b- Grow only at night

c- Reduce leaf area

10-Light intensity is especially impactful on halophytes that grow in:

a- Open coastal or arid environments b- Cold mountainous areas c- Urban gardens

Q2- Please combines the two columns:

Task	Drought-Deciduous	1	
	xerophytes		plants that germinate after fairly heavy rainfall to leach out the
	Sagna sles ogene	II) 60 69	inhibitors and to support growth. These species rapidly
	BARLEY SCHOOL HA		complete their cycles of development in a few weeks.
	Tolerant Plants	2	have underground organs full of water
	(arido-tolerant)		(rhizome, tuber, bulb and corn) that can survive periods of
	smittagma" - a		drought, being protected from excessive water loss by the soil.
	Ammophila	3	These plants have high stomatal
			conductance and high rates of photosynthesis and transpiration
	sestimonopulo soltuni.		when water is available but lose (shed) their leaves and enter
			dormancy under conditions of low water potential.
	trichophyllus	4	Plants that cannot escape periods of
			drought can adapt to these conditions by avoidance and/or
			tolerance.
	arido-passive or	5	
	Drought evader		to the species specific and adaptable capacity of protoplasm to
	xerophytes		endure severe loss of water.
	malacophyllous	6	species in the sands andspecies
	Distinct to A - or		in the mountains, both of which bear large attractively-
			coloured flowers. Needless to say, these two species are insect
			pollinated
	Tribulus, Capparis	7	In some xerophytic grasses the epidermis of the upper surface
			of the leaves have specialized motor cells (hinge cells)
	Icaneni servedika		responsible for minimizing the leaf area as in
			raj, un sumuyskamu galat

Faculty of Science Botany& Microbiology Department



كلية العلوم قسم النبات والميكروبيولوجي

Ecology of Xerophyte and Halophyte Plants 492 N Time: Two hours

Total degree: 50 marks

Second semester exam - the academic year 2024/2025 Fourth Level Exam date: Sunday, 1/6/2025

Q1- Please choose the right an	swer.	
1- How do halophytes deal with hig	h soil salinity?	
a- Closing stomata	b- Salt excretion	c- Reducing leaf number
2- Which of the following is not a n	retia supracron acid storic	a stydnosoc
	nechanism used by halophytes to ma	anage salt stress'?
a- Leaf abscission b	- Storage in vacuoles	c- Selective ion uptake
3- What is the most	critical factor influencing	halophyte growth?
a- Soil salinity	b- Water depth	c- Temperature
4- Temperature extremes affect halo	phytes by	
a- Preventing seed formation b-	Enhancing water absorption c- Li	imiting photosynthesis and
metabolism		
5- Compared to non-halophytes, hal	ophytes are	
a- Faually tolerant to drought	b- More tolerant to temperature ext	mamas a Nat offeeted less
temperature	o- More toterant to temperature ext	remes c- Not affected by
		Lab. ve filippoi O
6 Which environ	mental factor adds extra stress in s	aline environments due to
its irregularity.		A serol veloposion
a- Water availability	b- Soil minerals	c- Air humidity
7 Complete 1	colourd flowers syedles	
7- Some halophytes are adapted to:		
a- Constant rainfall	b- Drought periods	c- Low salt levels
8- What effect does light intensity ha	ve on halophytes?	
a- Increases growth only	b- Leads to excessive water loss	c- Has no impact

- 9- Restricting heavy metal translocation into shoot is defined as phytostabilization not phytoextraction
 a) True b) False
- 10- Ozone damages can be monitored by chlorite flakes of pine needle not by their roots
- a) True b) False

Question (2): Answer only five from the following questions (40 Marks = 8 x 5)

- 1. Write on the factors that govern the presence of bioindicator in environment.
- 2. How can higher plant and microbes, as bioindicators, respond biologically?
- 3. What is the type of pollution that may be faced by plant in roadside environment? On the basis of bioindicator, explain a case study assessing the relevant pollution.
- 4. Bioindicators have the ability to indicate indirect biotic effects of pollutants when chemical and physical measurements cannot, explain.
- 5. On scale of the lab, what are the major parameters that can judge and assess the polluted plants?
- 6. What are the criteria for selecting bioindicators and general biomonitoring tools?
- 7. Write on the criteria of water pollution and how can be biologically monitored?

BEST WISHES
Coarse coordinator and Examiner
DR/Amany Abeed

Faculty of Science Botany & Microbiology Department



كلية الطوم قسم النبات والميكروبيولوجى

Pollution and Bioindicators (BT 404)

Time: two hours
Exam Mark: 50

The academic year 2025

Special program for Plant Biotechnology and Microbiology

Exam date: Monday, 02/06/2025

Question (1): choose answer a, b, c, or d in the following statements (10 Marks)

- 1- A bioindicator may be a higher plant that monitor the health of environment
- a) True b) False
- 2- A good bioindicator provide additional information about intensity and amount of pollution exposure
- a) True b) False
- 3- Cell biology and genetics system can be used as biomonitoring and bioindicator tools
- a) True b) False
- 4- Biotic factors in an ecosystem refer to
- a) Non-living elements
- b) Physical features
- c) Living organisms
- d) Climate conditions
- 5- The primary mechanism of electrochemical cleaning of heavy metals from the soil is....
- a) Absorption
- b) Ion exchange
- c) Oxidation
- d) Filtration
- 6- Soil micro-organisms contribute to the remediation of heavy metal-contaminated soil by
- a) Enhancing metal concentration
- b) Facilitating metal absorption
- c) Increasing soil acidity
- d) b and c
- 7- Heavy metals uptake can be restricted by
- a) Stomta closure so that lower flux of metals into the plant
- b) Initiation of root hairs
- c) Increasing cell wall thickening
- d) a and c
- 8- Halophytes accumulate synthesis osmotically compatible solutions such as proline, glycine betaine in their shoots to increase their ability to combat heavy metal pollution

a) True

b) False

idabi

- greatest potential for the aerosolization of pathogenic microorganisms. This indicates the importance of.....
 - a- Hospitals and microbiology laboratories, bioaerosol control methodologies
 b- Schools, medical education

 - c- Sports clubs, athletics
- 25- Which of the following bacteria produces toxins?

 - a- Clostridium botulinum b- Staphylococcus aureus
 - c- All of the above

- - a- Lipopolysaccharide
 - b- Teichoic acid
 - c- Peptidoglycan
- 20-Given below are two statements:

<u>Statement I:</u> Intramural aeromicrobiology is the study of microorganisms associated with outdoor environments.

<u>Statement II:</u> Some pathogens are uniquely adapted for survival and transmission in the intramural environment. One good example of such an organism is *Legionella pneumophilia*, the causative agent of Legionnaires' disease which is a severe form of pneumonia.

In light of the above statements, choose the correct answer from the options given below:

- a- Both Statement I and Statement II are false
- b- Statement I is false and Statement II is true
- c- Both Statement I and Statement II are true
- 21-There is still debate about the modes of influenza transmission, specifically whether influenza is mainly transmitted via true bioaerosols, or by droplets, or by direct or indirect contact. History of major influenza pandemics includes
 - a- Spanish flu (1918-1920) and Asian flu (1957-1958)
 - b- Hong Kong flu (1968-1969) and Swine flu (2009-2010)
 - c- All of the above
- 22-Geo-indigenous pathogens are those found in soils and are capable of metabolism, growth and reproduction; many of which are spore formers such as where such spores can potentially be aerosolized.
 - a- Bifidobacterium bifidum
 - b- Bacillus anthracis
 - c- Rhizobium leguminosarum
- 23- Given below are two statements:

<u>Statement I:</u> Waste disposal is a multibillion dollar industry in the United States. However, there is a potential threat for bioaerosol production via various methods of land application of biosolids and also loading operations.

Statement II: Major hazards associated with waste effluents are pathogenic microorganisms including bacteria, protozoa and helminths

- a- Both Statement I and Statement II are false
- b- Statement I is false and Statement II is true
- c- Both Statement I and Statement II are true

Microbial Ecology (B494) S2-2024/2025 Final Exam, 50 marks

- 13-According to the biological hierarchy, the biosphere is made up of.....
 - a- Populations
 - b- Communities
 - c- Ecosystems
- 14-Given below are two statements:

<u>Statement I:</u> The airborne epidemic spread of *Phytophthora infestans* spores causing the late blight of potato led to the 1845 Irish famine <u>Statement II:</u> Late blight can destroy potato crops in a fortnight.

In light of the above statements, choose the correct answer from the options given below:

- a- Both Statement I and Statement II are true
- b- Both Statement I and Statement II are false
- c- Statement I is true and Statement II is false
- 15-Which among the following is not a nitrogen fixing bacterium?
 - a- Rhizobium leguminosarum
 - b- Azotobacter chroococcum
 - c- Escherichia coli
- - a- tuberculosis, bacterial
 - b- aspergillosis, fungal
 - c- foot-and-mouth disease, viral
- 17-Airborne can cause both allergic reactions and chemical toxigenic responses from direct exposure to spores, cell wall components and mycotoxins.
 - a- Viruses
 - b- Molds
 - c- None of the above
- 18-Given below are two statements:

<u>Statement I:</u> Mechanisms of phosphate solubilization by phosphate solubilizing microorganisms involves release of organic acids and liberation of extracellular phosphatases

<u>Statement II:</u> Thiobacillus sp. can produce sulphuric acid through Sulphur oxidation which cause dissolution of phosphates

- a- Both Statement I and Statement II are false
- b- Statement I is true and Statement II is false
- c- Both Statement I and Statement II are true

7- Given below are two statements:

Statement I: Because most microorganisms have limited ability to survive when suspended in the atmosphere, the most common scales of its transport in the air considered are the mesoscale and macroscale.

Statement II: Spreading of the airborne phytopathogen Phytophthora infestans is an example of the submicroscale transport of pathogens in the aeromicrobiological pathway

In light of the above statements, choose the correct answer from the options given below:

- a- Both Statement I and Statement II are true
- b- Both Statement I and Statement II are false
- c- Statement I is true and Statement II is false

8- The decomposers in an ecosystem are

- a- Animals
- b- bacteria and fungi
- c- plants

9- In which of the following biological hierarchy level the properties of life emerge?

- a- Molecules
- b- Cells
- c- Organisms

10- Given below are two statements:

Statement I: Most microorganisms are unicellular where their cells perform all activities required for life

Statement II: Microorganisms are key drivers of the planet's biogeochemical cycles

In light of the above statements, choose the correct answer from the options given below:

- a- Both Statement I and Statement II are true
- b- Both Statement I and Statement II are false
- c- Statement I is true and Statement II is false

11-The two major processes in ecosystem dynamics are

- a- Matter and energy
- b- Reproduction and adaptation
- c- Water and nutrients

12-Given below are two statements:

Statement I: Biological entities suspended in air are called planktons Statement II: Spores of wheat rust can spread thousands of miles and infect other wheat crops downwind, causing catastrophic losses to wheat crops.

- a- Statement I is true and Statement II is false
- b- Statement I is false and Statement II is true
- c- Both Statement I and Statement II are true

Assiut University Faculty of Science

Department of Botany & Microbiology

Food Microbiology &Biotechology (406B)

4th level (Biotechnology Students)



جامعة أسيوط كلية العلوم قسم النبات والميكروبيولوجى

Final Exam: 18th May 2025 Time allowed: 2 hours

Answer the following:

(50 Marks)

Q1: Identify 10 only of the following: (15 Marks)

a-CRISPR

b-Foodborne pathogenic bacteria

c-Epigenetics

d-DNA methylation

e-RNAi

f-Food spoilage

g-Pasteurization

h-Chromatin remodeling

i-Salmonellosis

j-Bacteriocin

k-fermented meat products l-Listerosis

Q2: Write on 7 only of the following: (35 Marks)

1-Biogensis of miRNA

2- CRISPR-Cas9 mode of action

3-Mechanism of siRNA

4-Delivary of siRNA

5-Causes of food spoilage

6-E. coli O157-H7 as foodborne bacteria

7-Salmonella as foodborne bacteria

8-Benefits of probiotics

9-Mechanism of probiotics as antimicrobial

Rest wishes		Prof.	Naeima	Yousef

[Part A]: Choose the Correct Answer for the following questions. (25 points) (Each question worth one mark)

- 1- In moist environments within buildings, can proliferate rapidly within days and become established as colonies on solid surfaces, subsequently releasing toxins and/or allergens into the air.
 - a- molds and bacteria
 - b- viruses
 - c- None of the above
- 2- Given below are two statements:

<u>Statement I:</u> In terms of numbers, microbes represent most of the diversity of life on Earth and are found in every environment.

<u>Statement II:</u> Despite the pathogenicity of some microbes, many others are beneficial and contribute to the quality of human life.

- a- Both Statement I and Statement II are false
- b- Statement I is true and Statement II is false
- c- Both Statement I and Statement II are true
- 3- Name the process by which nitrogen return back to the atmosphere as atmospheric nitrogen gas by bacterial conversion of various nitrate salts?
 - a- Nitrogen Fixation
 - b- Nitrification
 - c- Denitrification
- 4- By processing waste materials and dead organic matter, which of the following organisms adds to the CO_2 pool?
 - a- Producers
 - b- Decomposers
 - c- None of the above
- 5- Numerous plant pathogens are spread by the aeromicrobiological pathway such as
 - a- Puccinia graminis and Ustilago tritici
 - b- Phytophthora infestans and Erysiphe graminis
 - c- All of the above
- 6- are considered as primary producers in an ecosystem?
 - a- Animals
 - b- Plants and algae
 - c- Fungi

A.	Answer Only three question	ons. Use well labeled diagr	
	appropriate.		(12 marks)
	 Explain how specific flavonoids Illustrate the Function and struct 	ure of nitrogenase enzyme	
	 Discuss the mechanism of lumin. Illustrate how the normal flo pathogenic organisms. 	escent bacteria in the squid to prore protects the host against	roduce light infection by
В.	Write short notes on Only thr	ee of the following:	(6 marks)
	Agrobacterium tumefaciens Frankia	2. Riftia pachyptila4. Buchnera aphidicola	asidines ensons enodal session
C.	Choose the correct answer to	the following questions.	(7 marks)
1.	Gunnera possesses unique qualiti		alized
	A) actinomyctes	B) cyanobacteria	
	C) rhizobia	D) Azotobacter	i to sonsisto sel
2.	How many molecules of ATP are r	equired to fix one molecules of	of nitrogen?
	A) 20	B) 6	0
	C) 16	D) 10	
	slow-growing bacteria, re encoded on their chromosome	N-fixation and nodulation fu	nctions
	A) Bradyrhizobium C) Rhizobium	B) Agrobacterium tumef D) Frankia	aciens
4.	How does a legume plant benefit is root nodules?	from rhizobia that living with	in the legume
	B) Rhizobia convert organ		
		nes from pathogenic organisms.	
-		n compounds (sucrose) to the le	gume plant.
5.	Aquatic fern which is an excellent		
	A) Gunnera C) Azolla	B) Frankia D) Marsilea	
	C) Azona	13) Warshea	
6.	A free-living nitrogen fixing ba	cterium is	
	A) Clostridium	B) Azotobacter	
	C) Rhizobium	D) Both A and B	

7. Leghaemoglobin is found in

A) Root nodules of legumes
B) Mycorrhiza
B) Coralloid roots
With My Best Wishes
Dr. Nivien Nafady
Dr. Shymaa Ryhan

Assiut University

Faculty of Science

Botany & Microbiology Department



Second Semester: May 2025

The time allowed: 2 hours

Total marks: 50 Marks

Course: Symbiosis Microbiology (496B)

Part I: Fungal Symbiosis:

Q1: True (√)-False (X) Questions: (5 mar)	ks)	
1. Tripartite associations found in orchid plants, as they involve the orchid, the ectendomycorrhizal fungus and the ectomycorrhizal host plant.	()
2. Fruticose lichens are either shrub-like small mounds, growing up from the ground, or beard-like, small tangles, attached to the substrate only at their bases.	()
3. Hyphal bridges as extraradical mycelium occur between roots of adjacent plants and can act as a mechanism for the transfer of nutrients between hosts.	()
4. Pegs of monotropoid mycorrhiza surrounded by finger-like projections of fungus-derived wall material.	()
5. The presence of rough endoplasmic reticulum and balloon-like Golgi equivalents in AMF spores act as storage compartments.	()
Q2. Differentiate between: (Answer 2 Only) (6 marks)		
A. Foliose and fructicose. B. Arbutoid and monotropoid mycorrhizas. C. Sexual and vegetative reproduction of lichen.		
Q3. Discuss the function of the following: (Answer 3 only) (6 marks)		
A. Vesicles.B. Orchid mycorrhizas.C. Extraradical mycelium of AM fungi.D. Lichen.		
O4: Write short notes on: (Answer 6 only) (A marks)		
 A. Development of intraradical hyphae of AM fungi. B. Life cycle of AM fungi. C. Structure characteristics of ectomycorrhizal fungi. D. Sources of mycorrhizal hyphae that penetrate the epidermal root cells. 		

1 | Page

E. Grouped of mycorrhizal plants.

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the state of the s	Professor Dr: Sanaa Mohamed Fahmy	
With best regards	Professor Dr. Sanda Monamed Family	
	de concernationes designations de la comme	
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Part 3: Write on	(5 marks)
1- Siderophores production?	
••••••	
••••••	
2- Phosphate solubilization?	
, to	
••••••	
· · · · · · · · · · · · · · · · · · ·	

. Nodules range from		•••••	
a- 1-5 cm	b- 1-7 cm	c- 1-9	d- 1-15 cm
0inserts into fashion, forming io	the cytoplasmic membra on channels, triggering th	ane of bacteria in a c ne release of intracel	calcium-dependent lular potassium.
a- Daptomycin	b- Tetracycline c- 5	Spectinomycin	d- Macrolides
a- Daptomycin	inhibiting the beta-ketoa b- Tetracycline c- pla	cyl synthases I/II(Fa tensimycin d- I	abF/B) Macrolides
12. Rhizobium spp. and	d Bacillus spp produced.	for phos	phate solubilization
a-gluconic acid	b- 2-ketogluconic acid	e- oxalic acid	d- malonic acid
13. β-lactam ring is pr	esent in		
a- Streptomycin	b- Neomycin	c- Tetracycline	d- Thienamycin
14. Streptomyces	produce boromyc	in	
a-fradiae	b- griseus	c- antibioticus	d- venezuelae.
15. Actinomycetes are	known to produce		
a- pyruvate	b-lactate c	- α-ketoglutarate	d- all of them
16. Actinobacteria hav	ve ability to secrete	Enzymes	-
a- Cellulases	b- Pectinases	c- keratinases	d- all of them
17. Streptomyces	responsible to a dist	inct soil odor	
a- fradiae	b- griseus	c- antibioticus	d- venezuelae.
18. Streptomyces	рі	roduce the antibiotic	lomofungin
a-fradiae	b-griseus	c-antibioticus	d-Lomondensis
19. Streptomyces plate	nsis produce the antineo	plastic drug	
a-bleomycin	b-neomycin	c-migrastatin	d- actionmycin
20. Neomycin produc	ed by Streptomyces		
a- griseus	b- cattleya	c- fradiae	d- clavuligerus
21. Streptomyces	produce boromy	cin	
a- fradiae	b- griseus	c- antibioticus	d- venezuelae.