4. What happens if substance # 13 is missing and what is the state of the model? (1 Mark)

5. What are the functions of the products of the regions # 16, 17 and 18? (1 Mark)

6. What are the goals of such a system? (1.5 Mark)

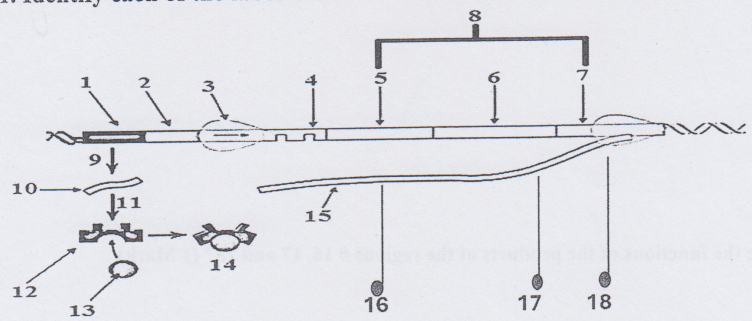
Good luck

Prof Dr. Mohamed Hemida Abd-All

Please note the exam in six pages

Q5. Look at the model provided and answer the following: (10 Marks)

1. Identify each of the labeled structures from 1-18 in the model. **4.5 Marks**



1		10	
2		11	
3		12	
4		13	
5		14	
6		15	
7		16	
8		17	
9		18	

2. What is the name of this model and its state? **(1 Mark)**

3. Where is the region of which component # 3 can start to bind? **(1 Mark)**

Q4. Complete the following sentences with the correct answer: (10 Marks)

1. ***Streptococcus mutans*** is the causal agent of .....
2. **Lumpy Jaw** is caused by .....
3. The causal agent of **botulism** is .....
4. **Tetanus** is caused by .....
5. ..... is a structural analog to **P-aminobenzoic acid** and blocks the formation of.....
6. The antibiotic **phosphonomycin** is a structural analog to ..... and blocks cell wall synthesis.
7. The antibiotic **D-cycloserine** is a structural analog to ..... and binds with .....
8. Integration of a **bacterial plasmid** with a **bacterial chromosome** is called .....
9. **Obligate anaerobic bacteria** undergo lethal effects due to .....
10. **Psychrophilic bacteria** adapt to cool environments below 10°C due to .....

Q3. For each of the following, state the position, composition, and function :(10 Marks)

Name	Position	Composition	Function
1. Cyanophycin			
2. Carboxysome			
3. Fimbriae			
4. Sheath			
5. Lipid inclusion			

Q2. Define each of the following scientific terms: (10Marks).

Scientific term	Definition
1. Differential medium	
2. Glycocalyx	
3. Decimal reduction time	
4. Chemotaxis	
5. Growth factors	
6. Magnetosome	
7. Virulence plasmid	
8. Antiseptics	
9. Generation time	
10. Complex medium	

Assiut University **Faculty of Science** **Botany & Microbiology Department**	**Date: January 13, 2025** **The time allowed: 2 hours** **Total mark:50**
Students: Biotechnology	**Bacteriology: BT203**

General Instructions: -Answer all the following questions.

Q1. Place a tick √ in the correct answer (10 Marks)

1. **Which of the following is not affected by Penicillin?**
   a. *Bacillus* b. *Diplococcus* c. *Trepenoma* d. *Mycoplasma*

2. **Bacteria of genus *Nitrosomonas* use _____ as their electron source?**
   a. NH_4 b. NO_2 c. NO_3 d. H_2S

3. **Which of the following is correct for membranous infolding in bacteria that initiate DNA replication?**
   a. Nucleosome b. Carboxysome c. Magnetosome d. Mesosomes

4. **Which of the following is not a characteristic of certain thermophilic bacteria?**
   a. Grow at 45-70^0 b. Unsaturated fatty acid c. Saturated fatty acids d. Peptidoglycan

5. **Which one of the following antibiotics inhibited lipid phosphatase, preventing the release of murine from its lipid carrier?**
   a. Cycloserine b. Bacteriocin c. Penicillin c. Vancomycin

6. **Cell divide in three planes in an irregular pattern producing bunches is called as?**
   a. Monococci b. Diplococci c. Streptococci d. Staphylococci

7. **Which of the following is inhibited by Tetracycline?**
   a. Protein synthesis b. Cell wall synthesis c. DNA synthesis d. Transpeptidase

8. **Which phase in a growth curve that the bacteria are checking and adjusting to their environment?**
   a. Stationary phase b. log phase c. decline phase d. lag phase

9. **Which bacterial structure resembles the mitochondrion most closed in function?**
   a. Pili b. Plasmid c. Plasma membrane d. Ribosomes

10 **Is DNA repairing enzymes characteristic of?**
   a. Mesosomes b. Magnetosomes c. Endospores d. Plasmid

13. The secretion of exotoxins and endotoxins by ..... caused a death of some farm animals

a. Cyanophyta b. Euglenophyta c. Diatoms d. Chloropyta

14. Sexual reproduction is not found in .....

a. Spirogyra b. Nostoc c. Chloropyta d. C&A

15.Euglena sp. Multiply and reproduce by .....

a. Fragmentation b. longitudinal binary fission c. Scalariform conjugation

Q3 :Write short notes on two only from the following **(20 marks)**

1: Harmfull and beneficial aspect of algae

2: Sexual reproduction of Spirogyra sp. (illustrate with drawing)

3: General character of diatom cell

Best wishes , Prof.Awatief F. Hifney

QI: Choose the correct answer of the following:

1. Nostocales members have filamentous with ..... heterocyst

a. Basal b. Intercalary c. No

2. The cell walls composed from ..... in Diatoms

a. cellulose b. Silica c. peptidoglycan d. Chitin.

3.Cell wall of Euglena composed from .....

a. Calcium carbonate b. Cellulose c. Peptidoglucan d. Euglena have no cell wall

4. Some species of blue greens and ..... able to Fix atmospheric nitrogen

a. Bacteria b. Chlorophyta c. A&B d.Diatoms

5. *Microcystis* sp.and *Rivularia* sp. are belonges to.....

a. Cyanophyta b. Diatoms c. Chlorophyta d. Charophyta

6. Cyanophyta and Myxophycophyta are used for popularly name known .....

a. Blue green algae b. Chlamydomonas sp. c. Pandorina sp.

7. Chlamydomonas sp. character by .....shaped Chloroplasts

a. Star b. Spiral c. Cup d. Discoid

8. Bacteria resample ..... in the structure of the cell wall

a. Cyanophyta b. Chlamydomonas c. Nostoc d. Diatoms

9. Reserve food material of Chlorophyta is.....

a. Oil b. Glycogen c. Starch d. Phycocyanin

10 Pandorina and spirogyra belonging to.....

a. Cyanophyta b. Oscillatoriales c. Chlorophyta d. Chrococcales

11. False branching of Cyanophyta have been Observed in.....

a. *Scytonema* sp. b. Chlamydomonas sp. c. Pandorina sp.

12. Heterocyst play an important role in .....of cyanobacteria

a. Binary fission b. Nitrogen fixation c. Asexual reproduction d. B&C

Department of Botany & Microbiology, Faculty of science

Course: phycology (204 NT) , Time: TWO hours, 2024-2025

Answer the following Questions :

Question no (1) : Choose (T) for true or (F) for False statements for the following statements (15 marks)

No.	Sentence	T	F
1	*Nostoc* sp. is prokaryote while *Oscillatoria* sp. is eukaryotic microorganism		
2	*Chrococcus* sp. reproduce vegetatively by longitudinal binary fission		
3	Rivulariaceae character as filamentous algal with basal heterocyst		
4	Euglena have an eyespot near the anterior end of the cell		
5	Sexual reproduction is not found in *Oscillatoria*, It reproduces by fragmentation		
6	The cell wall of Euglenophyta composed from peptidoglycan		
7	Filamentous form of cyanobacteria belongs to Chlorococcales		
8	Most of Chlorophyta show gliding or creeping, rotator movements		
9	Algae are collective term for all thalloid chlorophyll bearing organism		
10	Growing of algae increase oxygen content in the environment		
11	Cyanophyta resemple bacteria in the absence of a definite nucleus and plastids		
12	The sole method of reproduction in Chlorella sp. is by formation of autospores		
13	Asexual reproduction of Hydrodictyon occur by the formation of a large number (up to 20,000) of tiny biflagellate zoospores		
14	Asexual reproduction not recorded in spirogyra sp		
15	Cyanophyceae share and affinities with the Rhodophyceae in absence of Sexual reproduction		

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4- عرف كل من: (3 درجات)

أ- النباتات الطبية

ب- الزيوت النصف مجففة

ج-علم النبات الاقتصادي

السؤال الثالث: أجب عن اثنين فقط مما يلي : (10 درجات)

1- اشرح طريقة إنتاج حامض الستريك. واذكر أهميته في الصناعة؟

2- الفلفل الأسود من البذور التي نستخدمها كثيرا. فما هي فوائده؟

3- اذكر أنواع المنتجات الميكروبية مع ذكر أمثلة لكل نوع.

انتهت الأسئلة,,,,,,,,,,,,

مع اطيب امنياتي بالتوفيق

د/ هويدا عبد القادر

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4- يحتوي النعناع علي:

A) المينثول B) الاليسين C)الفلافونويدات D)الفقرة (A) و(C)

5- يستخدم نبات ..... في علاج النقرس والروماتيزم.

A) *Papaver somnifarum* B) *Ephedra sinica* C) *Colchicum* D) جميع ما سبق

6- من الزيوت المجففة زيت:

A) الذرة B) القطن C) الكتان D) الزيتون

7- يدخل فطر الخميرة في صناعة:

A) السوربيتول B) الخل C) حمض اللاكتيك D) ليس مما سبق

8- البكتيريا المنتجة للبيوتانول والايثانول والاسيتون:

A) *Clostridium acetebutylicum* B) *Enterobacter aerogenes*

C) *Acetobacter suboxidance* D) ليس مما سبق

9- من فوائد الفانيليا:

A) مضاد للأكسدة B) تحفيز الهضم C) مضاد للبكتيريا D) جميع ما سبق

10- يستخدم الخيزران في صناعة:

A) النسيج B) الأثاث C) الفقرة (A) و (B) D)البلاستيك

السؤال الثالث: (10 درجات)

1- ماهي طرق الحفاظ على البهارات؟ (درجتان)

2- عدد الأهمية الطبية لنبات الثوم. (درجتان)

3- اشرح طرق استخلاص الزيوت العطرية. (3 درجات)

كلية العلوم
جامعة أسيوط

امتحان نهاية الفصل الدراسي الاول
للعام الجامعي2025/2024
الزمن: ساعة
الدرجة :50 درجة

المادة : نبات اقتصادي211 ن

المستوي الثاني
التاريخ:22 /2025/1

جامعة أسيوط

الأسئلة تقع في 3 صفحات

السؤال الأول: (20 درجات)

أ- ضع علامة صح أو خطأ: (10 درجات)

1- تعتبر صناعة الكحول الإثيلي من الصناعات الهامة التي تعتمد علي فطر الخميرة. ( )
2- الكينين مادة بيضاء مرة تستخرج من قلف نبات *Cinchona* وهي العلاج الوحيد لمرض الملاريا. ( )
3- للحفاظ على نشاط ونقاوة السلالة الميكروبية يجب عدم نقلها كل فترة لبيئة اخري. ( )
4- زراعة الأرز لا تحتاج لكميات كبيرة من المياه. ( )
5- تستخدم بكتريا *Acetobacter* لإنتاج السوربيتول. ( )
6- (يلانج يلانج *Cananga odorata*) هي عشبة تقتل البكتيريا والفيروسات وتحفز الجهاز المناعي. ( )
7- زيت النارولي يُحضر من زهور شجرة البرتقال والنارنج. ( )
8- يبدأ جمع محصول الشاي الورقي عند بلوغ الاشجار 4-5 سنوات. ( )
9- يستخدم الكركم لعلاج آلام المفاصل والمعدة وتحسين الدورة الدموية. ( )
10- تدخل بعض البهارات في صناعة مستحضرات التجميل والعطور. ( )

ب- أكمل ما يلي : (10 درجات)

1- لابد من توافر بعض الظروف المناسبة للإنتاج الصناعي للميكروب مثل .....,..... , ... ,..... .
2- يستخدم الجوت في صناعة.....و.....و.....
3- .....و..... من البهارات التي تنتج من الجذور والدرنات.
4- نبات الزعتر له عدة فوائد منها..... و.....
5- من التحديات التي تواجه زراعة القطن ..... و.....
6- الإيفيدرين مادة قلوية تستخرج من شجيرات قصيرة في الولايات المتحدة تستخدم لعلاج ..... و.....
7- الميكروب المستخدم في الصناعة لابد ان يكون .....,.....
8- ينقسم نبات البن حسب الصفات المورفولوجية إلى 3 أنواع هي.....و.....و.....

السؤال الثاني: اختار الإجابة الصحيحة لكل مما يأتي: (10 درجات)

1- من بعض النواتج الثانوية لصناعة الكحول:
A) حامض السكسنيك B) الجليسرول C) حامض اللاكتيك D) جميع ما سبق

2- يستخدم عقار..... في علاج اضطرابات القلب وتنظيم ضرباته وتحسين الدورة الدموية.
A) الديجيتاليس (B) المينثول C) الكينين D) ليس مما سبق

3 - نبات يزرع بكثرة في أمريكا الجنوبية وهو يستخدم كمخدر موضعي ومقوي للجهاز الهضمي والعصبي.
A) الصنوبر B) الكوكايين C) الجارونيا D)العرقسوس

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20. Who came to the conclusion that the fermentation was catalyzed by a vital force?

a) Louis Pasteur b) Wilhelm KÜhne c) Eduard Buchner d) J. B. Sumner

Q2) Distinguish between <u>three</u> of the following: ***(3 Marks for each)***

1) Transpiration and guttation

2) Flocculation of Lyophilic and Lyophobic colloids

3) Imbibition theory and Capillary theory

4) Role of copper, molybdenum and zinc in plant

Q3) Write on <u>two</u> of the following: ***(3 Marks for each)***

a) The relation between osmotic pressure, turgor pressure, and suction pressure (D.P.D.) when Opi > Ops.

b) Transpiration Pull and Cohesion of Water

c) Mechanism of stomatal opening and closing (**Active Potassium Theory**)

Q4) Compare between <u>two</u> of the following: ***(3 Marks for each point)***

a. Phosphatase and Kinase enzyme

b. Cyclic and non-cyclic photophosphorylation

c. Oxidase and peroxidase enzyme

d. Chloroplast and Mitochondria

Q5) Write the enzyme which catalyzing three of the following:

(3 Marks for each point)

a. Carboxylation of carbon dioxide to phosphoglyceric acid

b. Phosphorylation of adenosine diphosphate to adenosine triphosphate

c. Conversion of xylulose 5-phosphate to ribulose 5-phosphate

d. Conversion of dihydroxyacetone phosphate to its glyceraldehyde form

e. Hydrolysis of sucrose

Good luck

Prof. Dr. Abeer Radi *Prof. Dr. Fatma Farghaly*

06

8. Water holding capacity of the soil is much greater in,
a) Sandy soil b) Clayey soil c) loam d) None of the above

9. Which of the following minerals is a constituent of cell membranes and nucleic acids?
a) Zinc b) Potassium c) Phosphorous d) Manganese

10. Chlorosis is yellowing of the leaves, caused due to the deficiency of
a) Zinc b) Potassium c) Manganese d) All of the above

11. Light reaction is termed as
a) Photolysis of water b) Calvin cycle c) Evolution of oxygen d) a and c

12. Formation of fumaric acid occurs in
a) Chloroplast membrane b) Cristea c) Cytoplasm d) Matrix

13. In the photosynthesis light energy converted into
a) ATP b) Sugars c) a and b d) ATP and $NADPH_2$

14. The fermentation occurs in
a) Stroma b) Grana c) Cell wall d) Cytoplasm

15. Chlorophyll - a contains:
a) CH_3 b) CHO c) COOH d) NH_2

16. Acceptor of carbon dioxide in Calvin cycle is.....
a) $FADH_2$ b) GAP c) RUBP d) Sucrose

17. Electron acceptor of photosystem II is
a) Ferrodoxin b) Plastoqunine c) Cytochrome c d) None of the above

18. The oxidation of phenolic compounds to the quinine form in the presence of atmospheric oxygen is catalysed by
a) Super oxide dismutase b) Catalase c) Oxidase d) Peroxidase

19. EC (1.11.1.7) is referred to the
a) Oxidase b) Catalase c) Peroxidase d) Invertase

First Semester Exam.

2024/2025

Botany & Microbiology Department | **Plant physiology (251 B)** | **Time: 2 hours**

Second Level (Credit hours)

Q1) Choose the correct answer: *(20 Marks)*

1. **Movement of water through the cell wall**
   a) Apoplast b) Symplast c) Tonoplast d) None of the above
2. **What is true about osmosis?**
   a) Diffusion of water through a semi-permeable membrane
   b) It is a passive process
   c) Both A and B
   d) None of the above
3. **What is active transport?**
   a) A transportation medium
   b) No energy required.
   c) Movement of molecules across a semi-permeable membrane with a protein
   d) Movement of molecules across a semi-permeable membrane against a concentration gradient with a protein
4. **Which of the following is a model for transpiration?**
   a) Cohesion-Adhesion transpiration model
   b) Cohesion-Tension transpiration model
   c) Tension transpiration model
   d) All of there
5. **How does imbibition depend on temperature?**
   a) It decreases with a rise in temperature.
   b) It increases with a rise in temperature.
   c) It is not affected by the temperature.
   d) None of the above
6. **Heterogeneous mixture in which some of the particles settle out of the mixture upon standing**
   a) Solution b) Solvent c) Colloid d) Suspension
7. **Define colloidal dispersion.**
   a) A true solution with particles suspended in the solvent
   b) Small particles suspended in solvent, not a true solution
   c) A heterogenous mixture of an immiscible solute and solvent

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10. What is the primary function of mycorrhizal associations?

A) Production of secondary metabolites
B) Pathogen control in plants
C) Nutrient exchange between fungi and plant roots
D) Decomposition of organic material

11. What is the characteristic feature of holobasidia compared to phragmobasidia?

A) They are multi-celled.
B) They are single-celled.
C) They produce more than four basidiospores.
D) They are involved in asexual reproduction.

Q2: Write on <u>FIVE ONLY</u> (with illustrations if possible) of the following: 15 Marks

1. Write briefly on the sexual and asexual reproduction of the causal organism of white rust disease.
2. Give an illustrated account of various types of asexual fruiting bodies.
3. Evolution of sporangia within Zygomycetes.
4. Give one difference in table between <u>3 only</u> of the following:-
   A. Heterothallism and Homothallism.
   B. Sclerotium and Pseudosclerotium.
   C. Holocarpic and Eucarpic fungi.
   D. Prosenchyma and Pseudoparenchyma.
5. Fragmentation as asexual reproduction in fungi.
6. Types of Zoospores and the role of zoospore flagellation in taxonomy of zoosporic fungi.

.....

Good Luck

Prof. Dr. Amal Danial

Dr. Elhagag Ahmed Hassan

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Part II: Mycology

Q1: Choose the correct answer (10 only): **10 Marks**

1. In which ecological niche would you most likely find coprophilous fungi?
   A) Freshwater lakes B) Soil rich in organic matter
   C) Dung habitats D) Aquatic environments
2. The intracellular absorbing structures of obligate parasitic fungi
   A. Appressorium B. Haustoria
   C. Snares D. All of them
3. Which type of mycelium in Basidiomycota is characterized by being binucleate and having clamp connections?
   A) Primary mycelium B) Secondary mycelium
   C) Tertiary mycelium D) All of them
4. Fungi that colonize host living tissues
   A. Biotrophs B. Hemibiotroph
   C. Necrotrophs D. All of them
5. Which Ascomycete is recognized as a model organism in genetic research and has contributed significantly to our understanding of eukaryotic genetics?
   A) *Neurospora crassa* B) *Saccharomyces cerevisiae*
   C) *Aspergillus nidulans* D) *Candida tropicalis*
6. Which of the following Ascomycetes is known for producing mycotoxins that contaminate food supplies, particularly grains?
   A) *Saccharomyces cerevisiae* D) *Candida albicans*
   C) *Penicillium chrysogenum* B) *Aspergillus flavus*
7. Non-motile asexual unit produced singly or in chains at the tip specialized cells
   A. Zoospores B. Sporangiospores
   C. Conidia D. None of them
8. Which class of Ascomycota is characterized by the formation of cleistothecial ascocarps with thin-walled prototunicate asci?
   A) Pyrenomycetes B) Discomycetes
   C) Plectomycetes D) Eurotiomycetes
9. The major virulence factor in *Cryptococcus neuformans* that helps to cause meningitis diseases
   A. Cell wall B. Capsule
   C. Secondary metabolite D. All of them

Faculty of Science Botany& Microbiology Department		كلية العلوم قسم النبات والميكروبيولوجي
General Microbiology (291 B) Time: Two hours Total degree: 50 marks	First semester exam - the academic year 2024/2025 Second Level Exam date: Wednesday, 15/01/2025	

Part I (Virology and Bacteriology)

Answer all the following questions:

The first question: Describe **three only** of the following: **(15 marks)**

1. How do Gm-positive and Gm-negative bacteria differ in their cell wall?
2. The role of plasmids in bacterial cells
3. Types, structure and function of bacterial flagella
4. Streptococcal diseases

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

1. Enterotoxin and neurotoxin
2. Capsule and slime layer
3. Capsid and capsomere

The third question: what is the function of each of the following? **(4 marks)**

1. Nucleus
2. Ribosomes
3. Toxin
4. Negative stain

2- Two types of erect stem.

Q6- Compare (in 4 points) between tap roots and adventitious roots: **(2 Marks)**

Tap roots	Adventitious roots

Best wishes
Dr. David Mamdouh Khalaf

Q4- Define each of the following (with labelled diagram): **(3 Marks)**

1- Cladodes:

2- Oblique leaf blade

Q5- With the help of labelled diagram write on each of the following: **(5 Marks)**

1- Structure and composition of corn *(Zea mays)* kernel.

Q2- Write the scientific term for each of the following: **(5 Marks)**

1- A small, spongy structure found at one end of castor seed. ( )

2- Is a specialized structure located at the tip of plant root. ( )

3- A thick, hygroscopic, spongy tissue that covers the aerial roots of certain epiphytic plants. ( )

4- Thin and cylindrical root clusters arise at the stem base of grasses. ( )

5- It's a unique growth behavior that enables plants to coil around supports they encounter. ( )

6- Fleshy buds found in many aquatic plants perform the function of perennation. ( )

7- A compound induces seed dormancy in *Cucurbita* seeds. ( )

8- It is formed during double fertilization process in which one sperm cell fuses with the two polar nuclei. ( )

9- Prostrate stems which crawl along the surface without rooting at intervals. ( )

10- A structure which serves as an entry point for the pollen tube during fertilization. ( )

Q3- Complete each of the following sentences **(5 Marks)**

1- In modified underground corm, the new corm may appear either above the old corm like in case of …….. or on the side of the old corm like in case of ……..

2- The fleshy buds in compound tunicate bulb are called……..

3- When the leaf base surrounds the stem partially, it is called …….. as in buttercup plant.

4- Leaf without petiole is called …….. leaf.

5- ……..are weak stemmed plants that climb up the support with the help of curved prickles.

6- …….. is modified into tendril in *Gloriosa* sp.

7- Beaded or moniliferous roots are found in ……..

8- …….. leaf blade is characterized by its wedge-shaped appearance that taper towards one end.

9- Stilt roots grow from …….. of the stem.

Assiut University	Part 2: Plant Morphology (221B) First semester final exam (10/01/2025) 2nd level students Total marks: 25	Faculty of Science Botany& Microbiology Department

General instruction: Please, write your answer on the space provided.

Q1- Choose the correct answer for each of the following: **(5 Marks)**

1- Leaf petiole is modified into tendril in.....

a. *Smilax* sp. b. *Pisum* sp.

c. *Clematis* sp. d. *Luffa* sp.

2- ..... is the main constituent of the castor seed endosperm.

a. Starch b. Aleurone grains

c. Oil d. Protein

3- An example of root climber is .....

a. money plant b. cypress vine

c. passion flowers d. lawn grass

4- Pitfall plant traps insects because it.....

a. has a digestive system like humans b. grows in soils which lack in nitrogen

c. is a heterotroph d. lacks chlorophyll

5- In most monocots the food reserve stays within the .....

a. cotyledon b. endosperm

c. testa d. radicle

6- A good example of reniform leaf blade is .....

a. european ginger b. redbud tree

c. water lily d. avocado tree

7- Conical storage tap root is found in .....

a. potato b. radish

c. carrot d. turnip

8- An example of stem which initially grow horizontally for a certain distance before turning upwards is .....

a. *Portulaca* sp. b. *Tridax* sp.

c. *Boerhaavia* sp. d. a and b

9- Which of the following produces thick and woody pillar-like structure roots?

a. *Mirabilis jalapa* b. *Acacia nilotica*

c. *Ipomoea tricolor* d. *Ficus benghalensis*

10- In hypogeal germination, the .....

a. epicotyl is shorter than hypocotyl b. epicotyl is longer than hypocotyl

c. epicotyl is equal to hypocotyl d. cotyledons are pushed above ground

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Botany and Microbiology Department

50 Marks | For students of the second level | Time: 3 hours

First Semester | Plant Ecology (B 241) | 2024/2025

Answer on the following questions:

I-Define each of the followings: (15Marks)

1-Plant zero; 2-dew point; 3-soil porosity; 4-eluviation layer; 5-VPD; 6- heliophytes;

7-C/N ratio; 8- primary productivity; 9- lithophytes; 10-thermoperiodism.

II-Choose the correct answer of the followings: (15 Marks)

1-Scavengers mean: a-plants b- animals c- insects d-fungi

2-Abiotic energy refers to: a-food b- water c- minerals d-gases.

3- Violet spectrum is absorbed by: a- yellow pigments; b- chlorophyll *a*; c- CO_2; d-none

4- A measure of plant immunity is called: a-hardening; b-efficiency; c-chlorosis; d-dormancy

5-Visible vapor is beneficial for: a- hydrophytes; b-halophytes; c-heliophytes; d-xerophytes

6- Height altitude causes a decrease in:

a- wind velocity, b- atmospheric pressure; c- light intensity; d-none

7- Soils transported by wind are called: a-alluvial b-colluvial; c-glacial; d-eolian.....soil

8- Partially decomposed organic matter is: a-litter; b-duff; c-humus; d-mull

9-Capillary pores are occupied by: a- air; b- water; c-minerals; d- organic matter

10-Acidic soils are found in: a- depressions b- cold c-temperate d- arid .....region.

III-Discuss THREE ONLY of the followings:(20Marks)

1-Effect of wind on plant environment. 2-Soil moisture constants.

3-Adaptatiol aspects of plants against high temperature. 4-Solonchak and solonetz soil.

Good Luck

Prof. K. A. FARGHALI

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The second question: writ short notes of the following question

1- Describe the floral characteristics of family Fabaceae with drawing the floral diagram, and enumerate two plants.
2- Describe the different types of racemose inflorescence
3- writ short notes on binomial nomenclature
4- Describe the structure of pollen grains with drawing.
5- Describe the structure of stamens with drawing and different types of stamens.
6- Define the epigynous flower, persistent calyx, monadelphous and apocarpous

The third question: copare between the following categories:

1- Compare between the corymb and umbel inflorescence.
2- Compare between legume and Follicle with given example.

GOOD LUCK

Assiut university **Botany and Microbiology Department** **Flowering Plant Taxonomy**	**Faculty of science** **Biotechnology** **(210 ن ت)**
Time: Two hours	

First term/ 2025

First question: choice the correct answer

1- Syncarpous condition refers to presence of:-

a. No carpel	b. Many free carpel	**c.** Many united carpel	d.Non-functional carpel

2- A condition when filaments are free but anthers are fused is known as:-

a. Adelphous	b. monadelphous	c. monathecous	d. monandrous

3- Six stamens (4 inner + 2 outer short):-

a. tetradynamous	b. hexaadynamous	c.didynamous	d. tetra-idynamous

4- In raceme, the flowers arranged in succession called:-

a. lateralpetal	b. basipetal	c. longipetal	d. Acropetal

5- Fruit with a single seed and pericarp fused with testa is called:-

a. achene	b. caryopsis	c. nut	d. cypsela

6- Flowers are unisexual and borne on the inner wall of the cup in cymose group:-

a. syconium	b. helicoid	c. scorpioid	d. verticillaster

7- Leguminous family with petals differentiated into standard, wings and keel is:-

a. Solanaceae	b. Oleaceae	c. Fabaceae	d. Brassicaceae

8- Flower is surrounded by two bracts called lemma and palea in family:-

a. Solanaceae	b. Oleaceae	c. Fabaceae	d. Poaceae

9- Which of the following plants is belonging to family Malvaceae:-

a. malva parviflora	*b. Hibiscus esculentus*	*c. Gossypium barbadense*	d. all the preceding

10- Subfamily that characterized by numerous free carpels and numerous stamens:-

a.Fabiodeae	b. Pyroideae	c. Rosoideae	d. Prunoideae

11- Which of the flowing plants is belonging to family Nyctaginaceae:-

a. malva parviflora	*b. Bougainvilleae glabra*	*c. Gossypium barbadense*	d. all the preceding

12- The credit of binomial nomenclature goes to:-

a. Theopharastus	b. Linnaeus	c. Cornquist	d. Takhatian

(c) Spermatium

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(d) Plurilocular gametangia

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(e) Phycobilisomes

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(f) Nucule

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(g) Auxospores

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(h) Isomorphic alternation of generation

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(i) Androspores

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كلية العلوم جامعة أسيوط	**Assiut University – Botany and Microbiology department** **Final Exam (2024-2025) for 2nd level students** **Phycology (273 B)** **Time allowed: 2h** **Total Marks: 50**	جامعة أسيوط

Answer the following questions (Exam in 3 pages)

Question #1: Match the following scientific names with the appropriate sentences:

(Cosmarium – Nostoc – Oscillatoria – Vaucheria – Ulva – Euglena – Spirulina – Spirogyra – Porphyridium – Chlamydomonas – Cyclotella – Volvox – Sargassum – Chara – Chlorella – Oedogonium)

Q1		16

1. ..... reproduce asexually by autospores.
2. .....is a homocystous filament reproduce by fragmentation.
3. ..... is a unicellular alga with diploid vegetative cells.
4. ..... is a prokaryote rich in proteins and vitamins, used as food.
5. ..... is a unicellular alga containing phycobiliproteins.
6. ..... has a specialized coenobium.
7. .....reproduce asexually by planospores.
8. ..... is a genus of desmids.
9. ..... has fucoidan in the cell wall.
10. ..... is a filament with aplanogametic isogamy.
11. ..... reproduce by protonema.
12. ..... is a prokaryotic alga with a central heterocyst.
13. ..... contains asexual spores with four flagella.
14. ..... is a filament with reticulate chloroplast.
15. ..... reproduce by synzoospores.
16. ..... is known by metaboly.

Question #2: Write on 10 only of the following (With Drawing):

Q2		25

(a) *Gongorisra* stage.

.....
.....
.....
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.....

(b) Heterocyst

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Assiut University
Faculty of Science
Department of Botany
and Microbiology

جامعة أسيوط
كلية العلـــوم
قسم النبـــات
والميكروبيولوجى

Introduction to Biotechnology (BT201)
Final exam January 2025.

Time: 2 hrs.
Marks: 60

Read all questions and manage time carefully. Answer only 6 questions, each one starts in a new sheet of paper (10 marks for each question).

1. **a.** Define what biotechnology is, what is its ultimate goal? Mention some prominent achievements via biotechnology in relation to its history.
   b. The evolution of biotechnology would be classified in three stages, name them and write a short note on each of them.

2. **a.** Name the different types of biotechnology based on color.
   b. Mention the different techniques, which are usually used in biotechnology.

3. **a.** The applications of biotechnology are multiple and diverse in all life aspects, describe them.
   b. Glucose is the direct substrate for fermentation; Track briefly the pathway how it is biosynthesized (photosynthesis) and oxidized (respired and fermented).

4. Tissue culture is an efficient technique usually used in biotechnology:
   a. Summarize how it is conducted and its advantages.
   b. Totipotency and plasticity are the basis of tissue culture, define and give an account.

5. **a.** Clarify briefly why biotechnology (advantages, benefits)? And why not biotechnology (disadvantages, harms and ethical issues)?
   b. What are the differences between somatic and zygotic embryogenesis?

6. Hybridization and cloning are occurring since ancient times:
   a. Describe and compare them, give examples and name benefits.
   b. What are the GMOs; follow how they are produced.

7. **a.** Explain how Dolly was produced, hybridization or cloning?
   b. Name and elucidate the different types of cloning.

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29 12

Best wishes, Prof. Dr. Refat Abdel-Basset

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Q3: Put (√) or (X) for <u>15 ONLY</u> of the following sentences:- (15 Marks)

1. *Aspergillus niger* is used as model organism in biological researches. ( )
2. Sclerotia of *Claviceps purpurea* germinate forming each a large number of deep violet with long stalks round ascostroma of clestothecia. ( )
3. Ergometrine is a therapeutic compound that found in the fungal hyphae and sclerotia and is used to hasten labor and prevent postpartum bleeding. ( )
4. *Cordyceps* is one of necrotrophic parasites (on ants) of plectomycetes. ( )
5. *Aspergillus terreus* is used for production of Japanese sake. ( )
6. *Leveillula taurica* containing one ascus ascomata with myceloidal-like appendages and conidia are solitary. ( )
7. Secondary mycelia of basidiomycota characterized by binucleate mycelia and the clamp connections. ( )
8. In Heterobasidiomycetes, basidiocarps rarely formed. ( )
9. *Aspergillus flavus* is the anamorph of *Aspergillus petromyces.* ( )
10. Ergotism a disease produced when humans when food or animals or birds when feed on infected grains or grain products with *Claviceps purpurea.* ( )
11. Appendages solid and dichotomously branched tips ascomata with more than one ascus is characteristics of *Microsphaera* ascocarp. ( )
12. *Aspergillus niger* produces cholestrol-lowering drug. ( )
13. *Curvularia* produces dark conidia with only transverse septa. ( )
14. Chromoagar medium is used as a differentiation medium for the genus *Candida.* ( )
15. Aflatoxin B is an alkaloid given to women in the third stage of labor to prevent hemorrhage. ( )
16. *Cochliobolus* produces filiform ascospores. ( )

Q4: Write on <u>FOUR ONLY</u> (with drawings if possible) of the following:- (10 Marks)

1. Sexual and asexual life cycle of honey dew disease.
2. Different sexual sporocarps produced by fungi.
3. The main differences between ascomata of Erysiphales.
4. Economic importance of yeasts.
5. The difference between

   A. Unitunicate and bitunicate asci. **B.** Telomorphs of *Penicillium, Geotrichum* and *Alternaria.*

Good Luck

Dr. Elhagag Ahmed Hassan

Assiut University Faculty of Science Botany & Microbiology Dept		جامعة أسيوط كلية العلوم قسم النبات والميكروبيولوجى
Fungi (261B)	Final exam (Jan 2025)	Time: 2 hours
Botany students (2nd level)	Total Degree: 50	

Answer the following questions

Question 1: Select the correct term for each statement and write the term only in the answer sheet. (15 degree, one for each)

Synnemata- Karyogamy- Sporodochia – Trichomycetes – Pseudoplasmodium - Intracellular - Obligate saprobes - Mycorrhizae - Heterotrophes –Aplanospores - Planogametic copulation – Pleomorphic – Thallospores – Homothallic – Interbiotic

1	Fungi that enters in partnership or share benefit with plant roots.
2	Contains fungi that occur primarily in the gut of arthropods as commensals
3	They unable to manufacture their own food from inorganic material.
4	Spores are produced by transformation of pre-existing cells of the thallus.
5	Aggregation of uninucleate naked cells in Myxomycota.
6	Mycelia that penetrates into the host cells.
7	The fungal reproductive cycle that involves asexual and sexual phases.
8	They are mainly live on dead organic matter and cant infecting of living organisms.
9	Asexual non-motile sporangiospores.
10	Fungal thallus that attached to many hosts through the rhizomycelium.
11	Acervulus-like body, in which the compact mass of conidiophores develops on a cushion-like mass of hyphae.
12	If a single mycelium is capable of reproducing sexually.
13	Fusion of two naked, free gametes, one or both of which may be motile.
14	A large, erect reproductive structure bearing compact conidiophores fuse together to form a strand resembling a stalk
15	Fusion of the two nuclei brought together by plasmogamy to form a diploid (2n) nucleus or Zygote.

Question 2: Disscuss in brief Two points only the following (10 degree, 5 for each)

1. Types of vegetative reproduction in fungi.
2. Formation of primary and secondary plasmodium in the club root disease.
3. Life cycle of *Allomyces* sp.
4. Plasmogamy types in fungal sexual reproduction.

With my best wishes

Dr. Ghada Abd-Elmonsef Mahmoud

Q.4 Choose the correct answer (A, B, C, or D), write the correct answer if it is missing:- (Answer 14 points only) (14 Marks)

1- Which of the following statement is false about fungi?
A. Unicellular or multicellar microorganisms. B. Fungi produce their own food.
B. Some fungi are edible. D. Fungi grow on dead and decaying substances.

2- The fungi which derive their food directly from dead organic matter are known as
A. Predators. B. Decomposers. C. Mutualists. D. Parasitic fungi.

3- What is the name of the special hyphal tips through which parasitic fungi absorb nutrients directly from the cytoplasm of the living host?
A. Haustoria. B. Mildew. C. Constricting ring. D. All of the above.

4- What is the cell wall of true fungi made up of?
A. Chitin. B. Glucans. C. Mannans. D. Peptidoglycan.

5- Fungi which do not produce sexual spores where the sexual reproduction is lacking are known as
A. Myxomycota. B- Zygomycotina. C- Ascomycotina. D- None of all.

6- The highly resistant structures which are produced by some fungi under unfavorable conditions are referred as:-
A- Chlamydospores. B- Cell wall. C- Zoospores. D- Antibiotics.

7- Copulation of two motile, unequal size and morphologically similar gametes is referred as
A- Anisogamy. B- Oogamy. C- Fragmentation. D- Heterogamy.

8- The fungal cell is uniquely characterized by the presence of
A- Lomasomes. B- Smooth endoplasmic reticulum. C- Both a&b D- Cell wall.

9- The naked multinucleate protoplasmic mass which represents the somatic structure in some slime molds (Myxomycota) is referred as:-
A- Pseudoplasmodium. B- Plasmodium. C- Basidiospores. D- Mycotoxins.

10- Aggregation of large, erect and compact sporophores (compound conidiophores) are referred as
A- Pycnidia. B- Synnema. C- Acervulus. D- Ascospores.

11- The endogenous sexual spores which are produced by some higher fungi are known as:-
A- Arthrospores. B- Zygospores. C- Cleistothecium. D- None of all.

12- The fungal thallus which is entirely converted into reproductive structures is known as:-
A- Heterothallic. B- Saprophytic. C- Eucarpic. E- None of all.

13- Mycorrhiza, a relationship between fungi and roots of higher plants is:-
A- Parasitic relationship. B- Saprophytic relationship.
C- Epiphytic relationship. D- None of all.

14- The small particles which located in pockets between the cell wall and the plasma-membrane of the fungal cell are known as:-
A- Mesosomes. B- Trichomes. C- Zoospores. D- Ascogonium.

15- Yeasts are unlike bacteria in being
A- Unicellular. B- Multicellular. C- Prokaryotic. D- Eukaryotic.

16- Fungi which reproduce only by asexual means, and produce conidia:-
A. Are unable to undergo mitosis. B. Are members of the Deuteromycota.
C. Lack an anamorphic phase. D. All of the above.

Good luck *Prof. Abdel-Raouf Khallil*

9- Fungi in which the sexual stages are unknown and sexual spores are lacking.

10- The basidium that is divided into more than one cell by transverse or longitudinal setpa.

11- The main sterol found in the plasma membrane of fungi.

12- The fungal species in which a single mycelium is capable of reproducing sexually.

A Table for your answers:

1		2	
3		4	
5		6	
7		8	
9		10	
11		12	

Q3: Choose (T) for True sentence or (F) for False sentence) and correct the wrong words whenever possible (Answer 12 POINTS ONLY):- (12 Marks)

1- Members of Basidiomycota produce sexual spores that are usually borne in groups of eight inside a sac-like structure ( )

2- Ascocarps may be present or absent in the Ascomycota. ( )

3- Thallospores are produced by transformation of pre-existing cells of the fungal thallus and are detached by decay of the hyphae, or disarticulation of the thallus. ( )

4- Members of Basidiomycota produce sexual spores that are usually borne in groups of eight inside a sac-like structure.

5- Any fungus where a sexual stage has not been observed is not classified in the division Deuteromycota. ( )

6- Cleistothecia represent the special structures in which conidiophores may be produced singly or united in the base (free in the top) in saucer-shaped structure. ( )

7- The fungal taxa related to Oomycetes produce zoospores with single posterior whiplash flagella. ( )

8- The cell wall of slime molds (Myxomycota) is made of chitin. ( )

9- The female gametes are represented by haploid nuclei within definite structures known as ascogonia in Zygomyceteous fungi. ( )

10- Imperfect (anamorphic) fungi produce thick-walled sexual spore known as zygospores.( )

11- Anteriorly tinsel uniflagellum is the characteristic features for Oomyceteous fungi. ( )

12- The ostiolate flask-shaped conidiomata are known as perithecium. ( )

13- Apothecium is a globose (spherical), completely closed fruit body with no special opening to the outside and contain scattered asci. ( )

14- Fungi obtain their nutrients from other living or dead organisms. ( )

2	Primary plasmodium	Secondary plasmodium
3	Sexual spores of Ascomycotina	Sexual spores of Basidiomycotina
4	Oogonium	Ascogonium
5	Hetero-basidiomycetinae	Eubasidiomycetinae
6	Myxomycota	Eumycota

Q.3: Give the Scientif term for 10 ONLY of the following(Use the provided table for your answers):- (10 Marks)

1- The wide, open, saucer-shaped or cup-shaped sexual fruit body produced by some fungi.
2- Asexual, imperfect or conidial state of a fungal species.
3- The closed spherical sporocarps which are produced by some members of Ascomycota, in which the asci are usually scattered.
4- The amoeboid naked mass of multinucleate protoplasm lacking a definite form.
5- The fungal spores concerned with the fungal dispersal.
6- The fungal spores concerned with fungal with fungal survival.
7- The entire thallus converts into one or more reproductive bodies. Therefore, the vegetative and reproductive phases do not occur together.
8- The life cycle in which the main form of the life cycle is diploid.

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Department of Botany and Microbiology
Faculty of Science, Assiut University

Final Exam. For the 2rd level students – Jan., 2025.
Academic Program: Botany and Microbial Biotechnology
Subject: Mycology (207 BT) **Maximum Allowed Time: 120 Min.**

Answer the Following Questions (Illustrate your answers whenever possible)

Q.1: Define briefly with labeled illustrations TWO ONLY of the following:- (4 Marks)

1- Arthrospores:

2- Stroma:

3- Cleistothecium:

Q.2: Give only one difference between each of the following (5 points only):- (10Marks)

1	Gametangial copulation	Gametangial contact

Q4: Answer SIX ONLY of the following: **(30 Marks - 5 Marks each)**

a) Which of the secondary tissue are produced by the activity of vascular cambium? Describe with the help of diagrms the process of interxylary phloem formation?

b) Classify xylem depending upon the position of protoxylem in the vascular bundles? Define and describe with drawing different types of vascular bundles characteristic of Angiosperms.

c) Classify buds depending upon their location on the plant body and their nature? Give their function?

d) Write an account of underground stems? Mention the purpose of their modifications?

e) What is the function of vascular tissue system? Write an account of adaptation of structure to function of this system?

f) Define bark? Mention its types? Name two products obtained from it? Mention their uses? What happened if the bark is removed? Why?

g) Classify the tissues of continues cell formation depending upon their origin, function and locations in the plant body. List the characteristic features of it?

h) Define venation? Describe with drawing different types of venation found in Angiosperm.

Q5: Write in Table the scientific expression for each of the following : (1/2 Mark for each)

a) Gives cortex, pericycle, medullary ray and pith.

b) Accumulate on the perforated cross walls of sieve tubes.

c) Mechanical living supporting tissue.

d) Encloses the growing point of the root.

e) A simple unspecialized permanent tissue.

f) A protective tissue originated from secondary meristem.

g) A simple permanent tissue originated from secondary meristem.

h) A permanent dead tissue support woody plants in late stage of life.

i) Arises from the parenchyma cells between bundles.

j) Stoma with numerous subsidiary cells around the guard cells.

"Good Luck"

Prof. M.A. Elnagdy

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Assiut University, Faculty of Science, Botany & Microbiology Department		جامعة أسيوط - كلية العلوم قسم النبات والميكروبيولوجي
First Term Exam, Jan. 2025 Plant Morphology and Anatomy (221B) 2nd level Students, Faculty of science (Biotechnology)		Exam Date: 20/ 1/ 2025. Time allowed: 2 hours. Total Marks: 50 Marks.

Answer All the following questions:

Q1: Give reasons for each of the following: **(6 Marks)**

a) In some plants the leaves are adapted to catch and digest insects.

b) Parenchyma is considered simple and primitive tissue.

c) Water conducting elements are hard and strongly lignified.

d) Modifications of stem in some plants into thorn (spiny stem) and phylloclade (leafy stem).

e) Sieve tubes have specialized perforated cross walls and sometimes loss their function.

f) Formation of annual rings in some old plants.

Q2: Give in table one difference at least with drawing if possible between each of the following: **(4 Marks)**

a) Vascular tissue of Gymnosperms and vascular tissue of Angiosperms.

b) Gramine stoma and Anisocytic stoma.

c) Chlorenchyma and Sclerenchyma.

d) Heart wood and Sap wood.

Q3: Draw with labelled diagrams 5 only of the following: **(5 Marks)**

a) Any three types of epidermal outgrowths.

b) Any three types of a simple unspecialized tissue.

c) Any three types of a simple tissue of secondary origin help in support of woody plants.

d) Diagrammatic Transverse section in monocot. stem.

e) Pattern of lignification in xylem vessels.

f) Two types of simple tissue support fast growing organs of plants.

Final Exam
2024/2025

Botany&Microbiology Department | Virology (281B) (Credit hours) | Science Faculty | Time: 2 hours

Answer the following: [Total 50 marks]

Q1: Complete the following: (10 marks)

1- The visible symptoms of viruses on plant are ……, ……., ……. and ……

2- Virus-like symptoms with other causes are ……..,……,…… and……

3- Plant viruses normally infect plants only through……

4- Capsid is responsible for ……..

5- Nucleocapsid is ……

6- Presence of an envelope confers instability on the virus as they are……..
……

Q2: Illustrate the target from the cryptogram and solve the following:(10 mark)

R/1: 1.1/16 + 0.8/16 + 0.7/16: U/E: S/Ap

Q3:Give the definitions for the following: (10 marks)

1-Necrosis 2-Chlorosis 3-Hyperplasia 4-Prions 5-Pseudovirion
6-mosaic 7-circulative transmission 8-Latent period 9-plant free virus
10-Virology

Q4: write on four only of the following: (20 marks)

a-Factors affecting virus transmission by contact
b-Transmission of Plant Viruses
c-Control of plant virus diseases
d-Tobamovirus group
e-Rhabdovirus group

Best Wishes

Prof. Naeima Yousef

3. What are the functions of the structure 1? (1 Mark)

4. What are the functions of the structure 2? (1 Mark)

5. Which structure is responsible for dermal necrosis? (1 Mark)

6. Which of the above structures is water soluble and water insoluble portions? (1 Mark)

7. Which type of staining can be applied for diagnosis of bacteria in Figure A & B? (1 Mark)

Good Luck

Prof Dr. Mohamed Hemida Abd-Alla

Q5. Look at the diagrams provided (A and B) and answer the following:

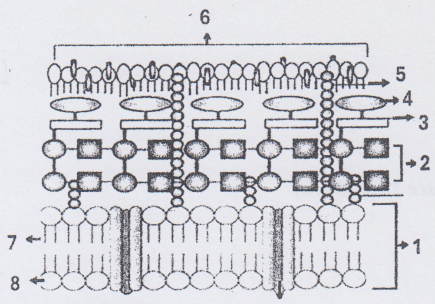

Figure A

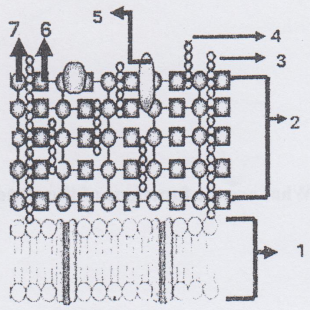

Figure B

1. **Identify each of the labeled structures from 1-9 in Figure A and from 1-7 Figure B in the following table: (4 Mark)**

#	Figure A	Figure B
1		
2		
3		
4		
5		
6		
7		
8		
9		

2. **Give the scientific names of bacteria depicted on Figure A & B? (1 Mark)**

Q4. Complete the following sentences with the correct answer. (10Marks)

1. The cross-linking of peptidoglycan chains in Gram-positive bacteria involves a ..... bridge
2. The enzyme .....catalyzes the formation of peptide bonds between amino acids in peptidoglycan.
3. The amino acid at position 3 in the peptide side chain of Gram-negative bacteria is .....
4. The enzyme..... removes terminal D-alanine residues during peptidoglycan synthesis
5. The antibiotic..... inhibits the recycling of the lipid carrier bactoprenol.
6. The antibiotic..... ..... is a structural analog of D-alanine and inhibits cell wall synthesis
7. The acid-fast cell wall of *Mycobacterium* contains a large amount of .....
8. A blue-black colony with a metallic green sheen on EMB agar is characteristic of.....
9. Endoflagella is characteristics of characteristic of.....
10. The plasmid which makes the host more pathogenic is.....

Q3. Define each of the following scientific terms: (10Marks)

Scientific term	Definition
1. Thermal Death point	
2. Transformation	
3. Transduction	
4. Growth Factors	
5. Disinfection	
6. Antispesis	
7. Ionizing radiation	
8. Complex Medium	
9. Photoautotrophs	
10. Generation time	

Q2. For each of the following, state the position, composition, and function:- **(10Marks)**

Name	Position	Composition	Function
1.Volutin			
2. Gas vacuole			
3. Magnetosome			
4. Chlorosome			
5. Ribosome			

Assiut University
Faculty of Science
Botany & Microbiology Department
Student: Microbiology/Chemistry & Microbiology
First semester final exam

Date: January 12, 2025
The time allowed: 2 hours
Total mark:50

Bacteriology: B 271

General Instructions: -Answer all the following questions.

Q1. Place a tick √ in the correct answer. (10Marks)

1. What is the main characteristic presence in Archaea that differentiates them from Bacteria?

a. Ether-linked lipids b. Organelles c. Linear chromosome d. Nuclear membrane

2. Which scientist is known for developing antiseptic surgery techniques?

a. Joseph Lister b. Robert Koch c. Louis Pasteur d. Edward Jenner

3. Which type of dye contains negatively charged chromogens?

a. Acidic dyes b. Fluorescent dyes c. Neutral dyes d. Basic dyes

4. Which type of inclusion body is composed of poly-beta-hydroxybutyrate?

a. Protein b. Lipid c. Nucleic acid d. Phosphate

5. Which structure allows bacteria to adhere to surfaces?

a. Flagella b. Pili c. Fimbriae d. Sheath

6. Which structure helps bacteria resist phagocytosis by white blood cells?

a. Flagella b. Cytoplasm c. Capsule d. Gas vacuoles

7. What structure forms around the isolated nucleoid and cytoplasm during early sporulation?

a. Exosporium b. Spore coat c. Forespore d. Cortex

8 What does the peptide side chain in peptidoglycan typically end with?

a. L-alanine b. L-lysine c. D-glutamic acid d. D-alanine

9.Which bacteria require a low concentration of oxygen (2% to 10%) for growth?

a. Obligate aerobes b. Facultative anaerobes c. Microaerophiles d. Aerotolerant anaerobes

10. What is the primary energy source for chemolithotrophs?

a. Light b. Organic compounds c. Inorganic compounds d. Carbon dioxide