V. Summarized and count only FIVE ONLY of the Following Industrial Fermentation Process [15 Marks]:

1. Downstream process.
2. Different industrial products.
3. Different kinds of bioreactors.
4. Cell disruption methods.
5. General characters of industrial tank.
6. Writ about foaming formed during fermentation process (how formed, disadvantages, and methods of treatment).

VI. Select the most correct answer in the following [5 Marks]:-

[1] The biomass product of the industrial fermentation includes				
a) Baker's yeast	b) *Spirulina*	c) *Lactobacillus lactus*	d) mushrooms	e) All points are correct
[2] Industrial fermentation process needs				
a) microorganisms	b) treated raw materials	c) bioreactors	d) products	e) All points are correct
[3] Industrial raw material must be contains..... and after treatment named				
a) C source	b) N_2 source	c) inducers	d) antifoaming	e) inhibitors
f) starter	g) inoculum	h) mash	i) Buffers	j) all points are correct
[4] Laboratory scale fermentor has .....; pilot scale has.....; semi industrial scale has ..... but the industrial production tank has ..... and the tank must be contains ..... total volume of production tank.				
a) 20-100	b) 75%	c) 1-20 L	d) 100,000 to 500,000 L	e) more than 100L
[5] Fermentation modes includes				
a) Batch	b) Fed batch	c) Continuous	d) Semi continuous	e) All points are correct
[6] Ideal factors for production of penicillin by fermentation includes.....				
a) 6.5-7 pH	b) 6-7 days	c) at 20-24□	d) All points are correct	
[7] .....responsible about the production of 1ry metabolites by microorganism				
a) decline phase	b) Idiophase (stationary)	c) lag	d) Trophophase (log)	e) All points are correct
[8] Colloid solutions used in preparation of the lyophilized spores may be				
a) serum	b) peptone	c) skimmed milk	d) sugars	d) All points are correct
[9] Inducers in natural penicillin V production is				
a) Chloride	b) Hydroxycinnamate	c) Phenyl acetic acid	d) All points are correct	
[10] Industrial fermentation products produced by genetic engineering technique named.....				
a) biomass	b) 1ry metabolites	c) 2ry metabolites	d) Enzymes	e) Recombinant	f) All points are correct

With All My Best Wishes and Good Luck

Assiut University
Biotechnology
Botany & Microbiology Department

28-12-2024
Time: Two Hours
Code No.: 317 BT

Faculty of Science
Industrial Fermentation
Final Examination of the First Term

Total marks 50

I. Complete the Correct Sentences from the Following Three Columns [5 Marks]:-

No.	Column 1	Column 2	Column 3
1	Industrial fermentation process occurs on three levels	and obtained from agriculture waste products	saccharin, starchy cellulosic, hydrocarbons, and vegetative oils
2	Mushrooms produced	Penicillin V is	Kojic acid
3	Industrial carbon source is classified into	soluble in polar substances like water, ethanol, ethyl acetate etc.	Upstream, fermentation, and downstream
4	Has $C_6H_6O_4$ molecular formula, white crystals, colorless, needle shape,	Column bags or tries reactor, at from 9-12 pH	by SSF under aerobic conditions
5	natural penicillin	in industrial bioreactors under perfect controls	produced by aerobic fermentation of *Penicillium chrysogenum*

II. Give One Word Clearing the Following Scientific Concept [2.5 Marks]:

1. ..... used for production of the biomass, 1ry metabolites, 2ry metabolites, enzymes, recombinant, and biotransformed product.
2. ..... from lyophilized spores to slant to conical flask to lap fermentor (one liter to 20 liters).
3. ..... treated raw material, cleared, sterilized, and suitable for fermentation by selected industrial .....
4. ..... are easily separate and purified, high yield and quality, cheap, easily (package, stored, and transported).

III. Short Notes about the Following [10 Marks]:

1. Pretreatment of raw materials for baker's yeast production.
2. General characters of industrial microorganisms and products.

IV. In Table Writ the Producer microorganism, Fermentation Mode, Type of Bioreactor, and Raw material FIVE ONLY in the Following [12.5 Marks]:

1. *Agaricus*
2. Penicillin V
3. Kojic acid
4. Inducers
5. Products formulation
6. Bioreactor body materials

With All My Best Wishes and Good Luck

Q3. Give the scientific term or scientific meaning for each of the following: (6 marks)

1. The most fast death factor (MFDF) causes death within few minutes/hours.
2. A group of phycotoxins consists of 2 protein amino acids and 5 non-protein monocyclic amino acids.
3. Mycotoxin which mainly targets kidney and causes its damage.
4. Fatal disease caused by ingestion of trichothecenes.
5. The detoxified bacterial toxins which retain their immunogenicity.
6. The Ergot alkaloid which is medically used in obstetrics to prevent bleeding after child birth.

Q4. Show with illustration the chemical structure of 3 only of anatoxin-a, sterigmatocystin, citrinin and lysergic acid. Mention the main producing microorganisms and refer to their toxic effects. (15 marks)

Q5. Explain the action mechanism of 4 only of the following: (15 marks)

- Diphtheria toxin.
- Cylendrospermopsin
- α-zearalenol
- Fumonisin B_1
- Okadaic acid

Best wishes

Prof. Dr. Ahmed Lotfy El-Sayed

Continue from page 1 to 2

Assiut University
Faculty of Science
Botany&Microbiology Department

Date: January 13, 2025
The time allowed: 2 hours
Total mark: _____
50

First Semester final Examination
(Microbial toxins)
Subject: Course 393B

Students: (Microbiology; Chemistry and Microbiology sections)

General Instructions: -Answer the following questions.

Q1. Choose the correct answer for each of the following: (7 marks)

1. Which toxin of the following activates adenylate cyclase enzyme in cells of intestinal mucosa?
   a. anthrax b. cholera c. diphtheria d. putrescine

2. Which one of the following is the main producer of fumonisins in corn?
   a. *Penicillium citrinum* b. *Fusarium oxysporum* c. *P. expansum* d. *F. virticilloides*

3. What does the A subunit in AB toxin stand for?
   a. accumulation b. enzymatic activity c. binding d. adhesion

4. What is the range of LD_{50} (ug/Kg) of anatoxin-a?
   a. 50-100 b. 20-50 c. 120-150 d. 200-250

5 . Which one of the following is related to amensic shellfish poisons (ASP)?
   a. okadaic acid b. saxitoxin c. domoic acid d. brevetoxins

6. Which one of the following is esterogenic metabolite?
   a. citrinin b. zearalenone c. patulin d. afl. M_1

7. Which one of the following mycotoxin groups causes alimentary toxic aleukia?
   a. aflatoxins b. ergot alkaloids c. tricothecenes d. ochratoxins

Q2. Place a tick √ or X in front of each of the following: (7 marks)

1. Aflatoxins mainly aim kidney and cause its damage. ( )
2. Citrinin causes renal diseases and contributes in kidney damage. ( )
3. Water content in grains is the limiting factor of mycotoxins formation in these grains. ( )
4. Hemolysin can be occurred in both fresh and marine water. ( )
5. Self-depuration is an effective mean to get rid of marine toxins, but it's expensive and needs long time. ( )
6. Cutaneous infection is not common form of anthrax. ( )
7. Volatile sulfur compounds and polyamines are protein bacterial toxins ( )

Continue from page 1 to 2

12) Symplastic movement of water takes place through .....
a- The cell wall
b- The plasmodesmata
c- The casparian strips
d- Through endodermis

13) Root pressure is due to
a- Active absorption
b- Passive absorption
c- Increased turgidity
d- Increased transpiration

14) The most widely accepted theory for ascent of sap is .....
a- Root pressure theory
b- Pulsatory theory
c- Capillarity theory
d- Cohesion theory

15) With rise in turgidity, wall pressure will .....
a- Increase
b- Decrease
c- Remain constant
d- Fluctuating

16) Exudation of xylem sap on cutting of a shoot is due to.....
a- Guttation
b- Root pressure
c- Transpiration
d- None of the above

17) 0.5 mole of sucrose in 0.5 littre of water, the water mole fraction= .....
a- 0.491
b- 1.965
c- 0.982
d- 0.5

18) In equilibrium, the water vapor potential at 20 C° above 1M NaCl solution equals....
a- -2.4 MPa
b- -3.6 MPa
c- -24 bar
d- -4.8 MPa

19) As the water content of a soil decreases, the hydraulic conductivity .....
a- Decreases
b- Increases
c- Does not change

20) .....are the major control point for plant water relations.
a- Epidermis
b- Stomata
c- Vessels
d- Root hairs

21) The ability of water to resist a pulling force is termed as .....
a- Hydrostatic pressure
b- Tensile strength
c- Vapour pressure
d- Osmotic pressure

Q2) **a-** Discuss the important roles of polarity and hydrogen bonds in the main biologically properties of water. **(8 Marks)**

b- How much the sap ascent by capillary action in a xylem vessel with a radius 15 μm? **(3 Marks)**

Q3) Define each of the following: (Answer Three only) **(3 x 3= 9 Marks)**

1- Factors which affect the availability of soil water to plants.
2- Root pressure.
3- Bulk flow and its relation with the plant-water absorption.
4- Transpiration pull.

Q4) Answer Two only: **(2 x 5= 10 Marks)**

a- Compare between transpiration and guttation.

b- Explain the different pathways by which water moves within the roots and quantify the root hydraulic conductance.

c- With a diagram describe the types of resistances against transpiration pathway.

Good Luck

Prof. Dr. T. Ramadan

Final Examination

Plant Water Relations
Course No.: 343B
Time allowed: 2 hours

Department of Botany & Microbiology
50 Marks
First semester 2024/2025
3rd Level (Special Botany)

Answer the following questions

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

1) Increasing solutes in a solution leads to ……
   a- Increasing its vapour pressure b- Raising its boiling point
   c- Lowering its freezing point d- a+b e- b+c

2) A cell with fully elastic wall is placed in hypertonic solution. What will **not** happen?
   a- Change in cell size and shape b- The whole cell will shrink
   c- Cytoplasm shrinks from the cell wall and undergoes plasmolysis d- Decrease in cell size

3) When a cell is placed in 0.5 M sugar solution, there is no change in it. So the external solution is called……
   a- Hypertonic b- Isotonic
   c- Hypotonic d- None of the above

4) When a cell is placed in 0.5 M solution of sugar, there is no change in its volume. But if the same cell is placed in 0.5 M solution of NaCl there will be……
   a- Decrease in volume b- Increase in volume
   c- No change in volume d- None of the above

5) Endosmosis takes place when a plant cell is immersed in……
   a- Isotonic solution b- Hypotonic solution
   c- Hypertonic solution d- HCl solution

6) A solution of 1.0 M glucose develops a pressure of -27 bars in an osmometer. What is **not** correct?
   a- Pressure potential is -27 bars b- Osmotic pressure is 27 bars
   c- Osmotic potential is -27 bars d- Solute potential is -27 bars

7) The osmotic potential of pure water is
   a- One b- Zero
   c- Less than zero d- Between zero and one

8) Sunken stomata in xerophytes……
   a- Increase transpiration b- Decrease transpiration
   c- Hinder transpiration d- Stop transpiration

9) When water enters the cell, …… is exerted on cell wall
   a- Osmotic pressure b- Suction pressure
   c- Turgor pressure d- Root pressure

10) Cell becomes turgid because of
   a- Plasmolysis b- Exosmosis
   c- Endosmosis d- Diffusion

11) The pathway in which water moves through cell wall without crossing any membrane
   a- Apoplast pathway b- Symplast pathway
   c- Vacular pathway d- Transmembrane pathway

←

٣١

V. Compare between FIVE ONLY of the Following [15 Marks]:

1. Thermophilic, psychrophilic fungi and clearing how these fungi adapted with the extreme temperature.
2. Fungicides, fungi statics, and clearing the target place inside the fungal cell.
3. White mycelium, multicellular dark sexual spores, and fruiting body in their sensitivity or resistance to the outer stress.
4. Agitated and static fungal cultures.
5. Synthesize for another and assists.
6. Parophilic and Parotolerant fungi.

VI. Select the most correct answer in the following [5 Marks]:-

[1] ..... sensory responses of fungi to contact effects					
a) Gravitropism	b) Anemotropism	c) Thigmotropism	d) Chemotropism	e) All points are correct	
[2] *Agaricus bisporus* is grow at.....pH and named					
a) Strongly acidic	b) Slightly acidic	c) Acidophilic	d) Alkalophilic	e) 5.5–6	
f) 2-5	g) 1-2	h) 11	i) All points are correct		
[3] UV radiation is effect on the fungi as					
a) teratogenic	b) killer	c) enhancer	d) inhibitors	e) mutagenic	f) all points are correct
[4] ..... defender molecule in cell wall against harmful light and help to penetrate the host cells in some pathogenic fungi.					
a) Flavin	b) Melanin	c) Carotenoids	d) Riboflavin	e) all points are correct	
[5] Growth co-factors are include					
a) vitamins	b) Amino acids	c) purines & pyrimidine's	d) sterols	e) All points are correct	
[6] *Saccharomyces cerevisiae* growth curve have .....phase					
a) three	b) five	c) seven	d) All points are correct		
[7] Chitin is .....polymers and found in.....cell walls					
a) glucose amine	b) N-acetyl glucose amine	c) glucan	d) all fungal	e) higher fungi	f) lower fungi
[8] Fungal cell walls are act as					
a) stored materials	b) Enzymes binding site	c) Filtering mechanism	d) Unfavorable conditions	d) All points are correct	
[9] Components of the fungal cell wall are differing depend upon.....					
a) Age& fungal part	b) Genus and species	c) taxonomical groups	d) All points are correct		
[10] .....is the orientation of the fungal mycelium towered or far from the source of light.					
a) Active molecules	b) Phototropism	c) Phototaxes	d) Photoreceptors	f) All points are correct	

With All My Best Wishes and Good Luck

Assiut University | 16-1-2025 | Faculty of Science
Microbiology and Chemistry &Microbiology | Time: Two Hours | Fungal physiology
Botany & Microbiology Department | Code No: 363B | Final Examination of the First Term
Total marks 50

I. Give One Word Clearing the FIVE ONLY of the Following Scientific Concept [5 Marks]:

1. ..... is degradation of glucose into two molecules of pyruvic acid in cytoplasm.
2. ..... each cell is increased in volume, weight, length and dived into two new cells.
3. ..... are fungal pigments act as defender molecules and protect the fungus against harmful effect of strong light and UV radiation.
4. .....at which the fungus can give the lowest growth and metabolic products and the points below it the fungus cannot grow.
5. .....when the fungal spores found their suitable substrates, reading all the surrounding factors and firstly are adapting with the outer nutritional and environmental factors.
6. ..... fungal zoospores in aquatic fungi go to (have positive responses) or far from the source of light (have negative responses).

III. Short Notes About THREE ONLY the Following [15 Marks]:

1. Zinc, Nitrogen, Copper and Phosphorus (classify the elements and clearing their function inside the fungal cell).
2. All the fungal relationships with higher plants.
3. Classify the factors affecting on the fungal growth (enumerate only).
4. Draw the diagram clearing the *Neurospora crassa* cell wall.

IV. If You Take One Soli Spores Suspension How You Regulate the Fungal Growth and Select FIVE ONLY of the Following Kinds of Fungi [10 Marks]:

1. Thermophilic
2. Salt loving
3. Submerged culture
4. Sugar loving
5. Surface culture
6. Alkalophilic

With All My Best Wishes and Good Luck

2- **Potential counter-adaptations by aquatic fungi may involve hiding from invertebrates:**

3- **Saprolegniasis showing the predisposing factors and modes of transition:**

The Best Wishes

Prof. Abdel-Raouf Khallil

<9

4- **Terrestrial-aquatic hyphomycetes**

Q.6: Give only one reason for each the following:- **(2 Marks)**

1- Superiority and predominance of aquatic hyphomycetes in aquatic ecosystem rather than terrestrial fungi and bacteria:-

2- The palatability of falling leaves and detritus which are colonized by aquatic fungi for aquatic invertebrates:-

Q.7: Write Briefly on 4 Only of the following:- **(8 Marks)**

1- **Food chain (Web) as affected by aquatic fungi.:**

11- Description of certain aquatic habitat which should be considered in any sampling procedure and deals with depth, dimension, geology of shores, sediment distribution, currents, inflow and outflow of water, etc.

12- The buffer zone between the warmest and coolest layers in aquatic habitat which ordinarily prevents the mixing of the two layers.

13- Aquatic fungi that are capable of very fast responses to changes in their environment since these organisms do not depend on macro-scale hyphal networks.

14- The relatively shallow water area along the shore of water streams and could be considered as a transition zone between terrestrial and aquatic habitats.

(Give your answers in the following table):-

No	Answer	No	Answer
1		8	
2		9	
3		10	
4		11	
5		12	
6		13	
7		14	

Q.5: Define Briefly Three only of the Following:- **(6 Marks)**

1- **Transient fungi:**

.....

.....

.....

.....

.....

.....

.....

.....

2- **Antagonism:** .....

.....

.....

.....

.....

3- **The light Profile of water ecosystem:** .....

.....

.....

.....

.....

9- Fungi that might arrive at the aquatic habitat and immediately start to decline in activity as a result of changes in conditions are referred as:
a- Migrants. b. Versatiles. c- Resident. d. Permanent. e. None of all.

10- Aquatic fungi that can tolerate a variable wide range of temperatures are known as:-
a. Eurythermic species. b. Mesophilic. c. Thermophilic. d. Psychrophiles. e- All of the above.

11- The sewage fungus which is usually found in polluted waters of high organic content like sewage and drainage water and may be of possible value as biological indicators of pollution.
a. *Leptomitus.* b. *Achlya.* c. *Saprolegnia.* d. Olpidium. e. *Aphanomyces.*

Q.3- Write (T) for True sentence or (F) for False sentence (Correct the wrong words; answer five only): (5 Marks)

1- Rhizophydium is responsible for mortality and population decline of frog worldwide.
(.....)

2- The simultaneous demand by two or more organisms for limited environmental resources, such as nutrients, living space, or light is referred as mutualism. ( ).

3- Rumen fungi mainly exhibited a negative effect on phytoplankton communities and altering phytoplankton dynamics throughout the season. ( ).

4- The fungal fish disease which is characterized by rough or granulomatous of the skin and white to gray-white lesions in the internal organs and different parts of the body is known as Ichthyophonosis.- ( )

5- Aquatic basidiomycetes are well adapted to their habitats, by forming oospores. ( )

6- An obligatory inter-relationship that is beneficial to both partnerships (e. g. Mycorrhizae) is known as antagonism. ( ).

Q.4: Give the scientific term which is related to TEN ONLY of the following (Put your answers in the next table):- (10 Marks)

1- Fungi which do not accomplish their whole life cycle under water, needing air exposure for reproduction (sporulation).
2- Two usually independent organisms cooperate to break down a nutrient neither one could have metabolized alone.
3- Competition between individuals which related to the species is known as:-
4- The association of organisms that live together and that exhibit well-defined nutritional or behavioral interrelationships.
5- An aquatic fungus which could be used as biocontrol agent for nematode.
6- The physical location in the environment to which an organism has adapted.
7- There is no any physiological effect between the fungal populations sharing aquatic habitat.
8- The organisms which feed on a variety of food sources.
9- It is a biological phenomenon by which an aquatic fungus produces one or more biochemicals that either positively or negatively influence the growth, survival, and reproduction of other organisms.
10- Aquatic fungi that move between aquatic and extra-aquatic habitats in haphazard rather than regular.

Department of Botany and Microbiology
Faculty of Science
Assiut Universitv

Final Exam. For the 3rd level students (Microbiology) –Jan. 2025.
Subject: Biology of Aquatic Fungi (361 B) Maximum Allowed Time: 135 Min.
Answer The Following Questions:- (Note: 6 pages should be considered)

Q.1: Give the organism (s) name which is related to Five Only:- (5 Marks)

1- The causative agent of Cryfish plague. (.....).
2- Aquatic fungi infecting cyanobacteria potentially improve the nutritional quality of cyanobacteria by adding sterols, or by rendering them edible by fragmenting large filaments or (.....)
3- Aquatic fungi that have high capability to degrade lignin (.....)
4- The aquatic fungus which is an obligate parasite on some arthropods and thereby is emphasized the great potential in the biological control of mosquitoes larvae. (.....)
5- The causal agent of shrimp Mycosis. (.....)
6- Aquatic fungi which may be among the main reasons for the disintegration of a water blooms. (.....)
7- Pythiomycosis for human. (.....)

Q.2: Circle the correct answer for 10 only (Give the fit word if it is missing):- (10 Marks)

1- Organisms that combat to capture of resources which have previously been captured by other organisms.
a. Guilds. b. Mutualistic. c. Scavenger. d. Synergistic. e- None of the all.

2- Group of metabolically related organisms that exhibit similar habitat requirements and that respond in a similar way to changes in their environment.
a. Wetlands. b. Chytrids. c. *Catenaria*. d. Saprolegniasis. e- None of all.

3- Variation of life forms, genera and species in an aquatic habitat.
a. Frequency of occurrence. b. Biodiversity. c. Population. d. All of the above.

4- A natural aquatic environment which is lacking a rapidly and continuous flow of water.
a. Migrants. b. Mesosomes. c. Thermocline layer. d. Lotic habitat. e. None of all.

5- The interaction between two different aquatic fungi at which one member benefits while the other does not benefit nor is it harmed.
a. Parasitism. b. Saprophytism. c. Anatgonism. d. Synergism. e. None of all.

6- The causative agent of gill rot disease of fish is:-
a. *Olpidiopsis.* b. *Aphanomyces.* c. *Alatospora.* d. *Plasmidiophora.* e- None of all.

7 Aquatic anamorphic fungi that actively growing and sporulating under clean and well-aerated water, they occur mostly on plant leaves in rivers or streams known as:-
a. Transeint fungi. b. Zoosporic fungi. c. Aeroaquatic fungi. d. Ingoldian fungi.
e. All of the above.

8- The aquatic fungal group producing one posterior whiplash flagellum is:-
a. Hyphochytridiomycetes. b. Oomycetes. c. Ascomycetes. d. None of the all.

13- .... diffuses either inward or outward.

a) Potassium (b) Calcium (c) Magnesium (d) Phosphorus

14- Carriers may transport .... ions or molecules per second.

a) 100-1000 (b) 10^6 (c) 10^4 (d) 20-100

15- .... are considered beneficial elements except ....

a) Cadmium (b) Cobalt (c) Aluminum (d) Selenium

16- .... transfers six electrons from ferredoxin to produce sulfide.

a) APS reductase (b) Sulfite reductase (c) Serine acetyl transferase (d) ATP sulfurylase

17- ATP-binding cassette (ABC) pump can be further characterized by

a) electroneutral (b) electrogenic (c) all of the previous

18- Nitrogen in the soil solution is readily absorbed by:

a) H^+-NO_3^- antiporter (b) H^+-NO_3^- symporter (c) channel (d) all of the previous

19- .... serves as an electron donar to the Fe in nitrogenase enzyme.

a) FADH2 (b) Ferredoxin (c) NADH+H (d) NADPH+H

20- Several compounds secreted by roots form stable chelates with iron except.

a) malic acid (b) citric acid (c) sugars (d) phenolics (e) piscidic acid

21- Phosphate is relatively unavailable to plant roots because

a) sorption capacity in soil (b) low solubility (c) all of the previous

22- .... consists of a protein shell with a core of 5400 to 6200 iron atoms.

a) Phytoferritin (b) Porphyrin (c) Flavin (d) all of the previous

---

Q2- Write on <u>five</u> of the following: .... (15 marks)

1- Supposed advantages of transpiration.
2- What makes an element essential?
3- Assimilation of oxygen to organic compound.
4- Assimilation of one of the cations.
5- Establishing symbiosis requires an exchange of signals.
6- Conversion of ammonium to amino acids.

Q3- Compare between <u>five</u> of the following: .... (10 marks)

1- Channels and carriers.
2- Contact and carbonic acid exchange theories.
3- H^+-Pyrophosphatase and Ca^{2+} pumps.
4- Symport and antiport transports.
5- H^+-ATPase and vacuolar H^+-ATPase pumps.
6- Essential and beneficial mineral element.

والله ولى التوفيق،، أ.د./ عفاف محمد حماده

كلية العلوم
جامعة أسيوط
Assiut University - Faculty of Science
Botany & Microbiology Department

جامعة أسيوط - كلية العلوم
قسم النبات والميكروبيولوجي

Mineral Nutrition
Time: 2 Hours
351 B

First Term Examination 2024 – 2025
3rd Level: Botany, Botany & Chemistry
Exam Papers: Two

Answer the following questions:

Q1- Read carefully and choose the correct answer of twenty only: .. (20 marks)

1- **Cell walls allow plant cells to build up internal .....**
a) imbibition (b) turgor pressure (c) surface tension (d) diffusion

2- **..... give rise to a phenomenon known as capillarity.**
a) Cohesion (b) Adhesion (c) Surface tension (d) All of the previous

3- **..... works down a concentration gradient.**
a) Osmosis (b) Tonicity (c) Diffusion (d) Cohesion

4- **Proteins that serve as aquaporins are always:**
a) anchored (b) peripheral (c) integral (d) All of the previous

5- **The major factors influencing the water potential in plants are .....**
a) concentration (b) pressure (c) gravity (d) all of the previous

6- **..... are tubular extensions of the plasma membrane.**
a) Plasmodesmata (b) Cytoplasms (c) Hairs (d) All of the previous

7- **Solutes move through ..... and ..... routes except for .....**
a) apoplast (b) symplast (c) channel

8- **..... principal functions of membrane proteins.**
a) Six (b) Two (c) Four (d) Nine

9- **The ..... prevents the ion from diffusing back out of the root.**
a) plasmodesmata (b) Casparian strip (c) hair (d) all of the previous

10- **The plant can complete its life cycle without ..... element.**
a) essential (b) beneficial (c) macro-nutrients (d) micro-nutrients

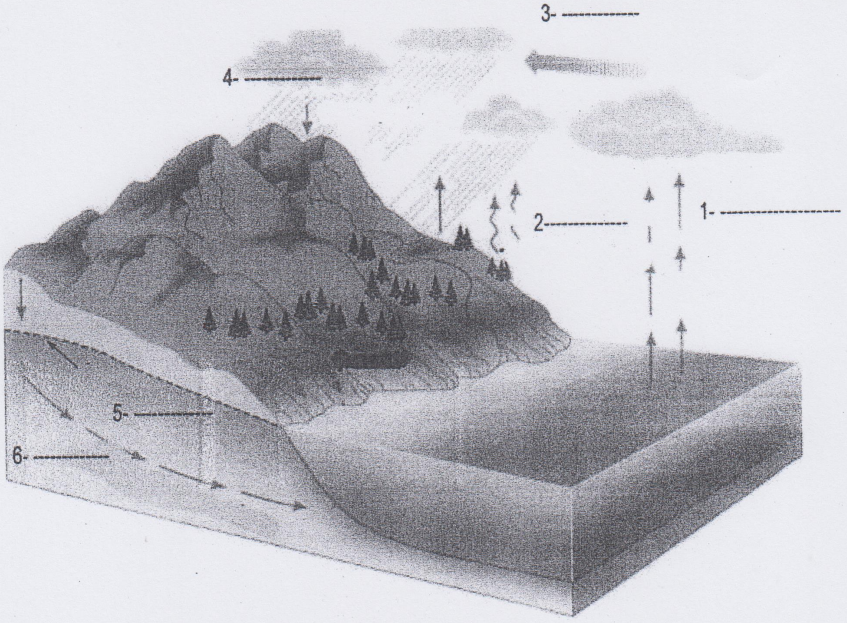
11- **There are ..... chemical elements that are apparently required for all plants.**
a) seventeen (b) three (c) fourteen (d) Twenty

12- **Nutrients that remain in ionic form.**
a) Group 1 (b) Group 2 (c) Group 3 (d) Group 4

٢٣

b) Write the name of this cycle and fill in the missing numbers.

Name of cycle----------



GOOD LUCK,,,,,

Dr. Suzan Tammam

10.....any area or region regarded as a unit for ecological observation and study of the interrelationships between organisms and their environment.

11.Conversion of solar energy by plants into chemical energy per unit area of space for unit time is called .....

12..... Chemical conversion of N_2 to more reactive forms, such as NH_3 or NO_3.

13.Biogeochemical cycle ....
.....

14.---------- is a method of animal husbandry whereby domestic livestock are used to convert grass and other forage into meat, milk, wool and other products.

Q 5: **(12.5 Marks)**

a) Put the number in each correct answer: -

1- Increasing the nutrients especially N &P in a body of water.	Competition ( )
2-Nitrogen fixation by bacteria in the root nodules of legumes.	Predation ( )
3- The relationship between remora living with a shark	Eutrophication ( )
4-An interaction between organisms or species, in which the fitness of one is lowered by the presence of another	Mutualism ( )
5-One organism, kills and eats another organism.	Commensalism ( )
6-It is a process in which large rocks are broken into small pieces and finally into soil particles	Parasitism ( )
7- Chemical conversion from nitrate (NO_3^-) back to N_2.	Weathering ( )
8-An essential element, being a constituent of many proteins and cofactors.	Denitrification ( )
9- A relationship between species, where one organism, the parasite, lives on or in another organism, the host, causing it some harm.	Phosphorus ( )
	Sulfur ( )

18.Chlorosis may result from ----------

a- Chilling	b- High temperature	c- Salinity	d- All answers are correct

19.The formula that can be calculate the temperature efficiency (I): ----------

a- I= 2(t-4.5)	b- $I = 2^{\left(\frac{t-4.5}{10}\right)}$	c- $I = 2\,X^{\left(\frac{t-4.5}{10}\right)}$	d- $I = 2^{\left(\frac{t-9.5}{10}\right)}$

20. ---------- represents the quantity of individual organisms present at each trophic level.

a-Pyramid of energy	b-Pyramid of biomass	c- Pyramid of nutrition	d-Pyramid of numbers

Q4: Give definition of the following: - **(8.5 Marks)**

1. Optimum temperature----------
---

2. Energy radiated in the form of electromagnetic waves is called ----------.

3. Abiotic factors----------
---

4. Consumers that eat only plants are called ----------

5. The layer of the planet Earth where life exists is called ----------

6. ……shows how each living thing gets food, and how nutrients and energy are passed from creature to creature.

7. Pedology……
……

8. …… the rate of generation of biomass in an ecosystem, usually expressed in g m^{-2} d^{-1}.

9. Pyramid of energy ……
……

7. The sun's radiant energy includes ----------

a-Visible spectrum only	b-Invisible spectrum only	c-Visible& Invisible spectrum	d- Ultraviolet

8. The upper end of troposphere layer is called ----------

a- Troposphere	b- Tropopose	c- Stratosphere	d- All answers are false

9. ----------relatively a young branch of biology which deals with the interacting system of organisms and their environment.

a- Ecosystem	b- Ecotype	c- Ecology	d- All answers are true

10.----------include everything that changes the local environment

a- Synecology	b- Ecosystem	c- Environmental factors	d- Ecotype

11.Organisms break down dead material into soil and return nutrients to the soil to use by plants called ----------

a- Producers	b- Decomposers	a- Consumers	d- Omnivores

12.The branch of ecology that studies the relationship of ancient plants and animals communities to their environments called ----------

a- Synecology	b- Ecosystem	c- Paleoecology	d- Ecotype

13.Biogeochemical cycles can be classed as: ----------

a- Gaseous	b- Sedimentary	c- Both a & b together	d- All answers are false

14. pH of fertile soil is ----------

a- Below 7	b- Above 7	c- Between 6-7	d- All answers are false

15.Light can affect plant functions **except**: ----------

a- Photosynthesis	b-Transpiration	c-Respiration	d- Phototropism

16.All these found in successful pollinator **except:** ----------

a- Good color vision	b- Bad memory	c- Tongue	d- All answers are correct

17.All these are from temporal variations in temperature **except:** ----------

a- At the sun rise	b- Long day plants	c- At sun set	d- At noon

5- Methods of measuring productivity:- a) ----------b) ----------

c) ----------d) ----------

6- Importance of the atmosphere:- a) ----------

b) ---------- c) ----------

7- The basis of ecology classification:- a) ----------

b) ---------- c) ----------

8- Importance of humus: - a) ----------

b) ---------- c) ----------

9- Types of pollinators:- a) ---------- b) ----------

c) ---------- d) ----------.

Q3: Choose the correct answer: **(10 Marks)**

1. The atmospheric layers contain all these answers **except**----------

a- Troposphere	b- Biosphere	c- Thermosphere	d- Stratosphere

2. Ecological productivity include ----------&----------

a-Primary productivity only	b-Secondary productivity only	c-Both (a &b) are correct	d- All answers are false

3. All answers are types of ecosystems **except**----------

a- Fresh water ecosystems	b- Chemical ecosystems	c- Ocean ecosystems	d- Terrestrial ecosystems

4. Environmental factors include ----------

a- Biotic factors	b- Edaphic factors	c- Climatic factors	d- All answers are correct

5. All answers are biotic components of ecosystem **except**----------

a- Producers	b- Rains	c- Decomposers	d- Consumers

6. All these are components of biosphere **except**----------

a- Lithosphere	b- Microsphere	c- Atmosphere	d- Hydrosphere

16	Primary productivity in an aquatic ecosystem such as a pond can be measured by Carbon Dioxide Flux.	
17	Harvest Analysis can be used to measure primary productivity for aquatic ecosystems.	
18	Radioactive tracer method estimates primary productivity in an aquatic ecosystem especially in lakes and oceans by using CO_2 uptake.	
19	Psammophytes can be grow on saline soil.	
20	Wetting – drying is from chemical weathering.	
21	Biological weathering occurs due to the bio activities of plants only.	
22	Eolian soils are transported by gravity.	
23	Young soil has an equilibrium state occurs between soil characters and the environment.	
24	Sandy soil rich in nutrients adsorbed on soil particles.	
25	The presence of the soil organisms decreases soil fertility.	
26	Reclamation of the white alkali soils by addition of gypsum.	
27	Chlorosis injury occurs due to high temperature only.	
28	Acidity increases the activity of microorganisms, particularly bacteria.	
29	Sciophilous plants can grow best in high sunlight intensities.	
30	The invisible spectrum of sunlight is useful in photosynthesis.	

Q 2: - Complete the following **(14 Marks)**

1- Net primary production (NPP) = ---------- - ----------

2- Components of ecosystem include : - a) ---------- b) ----------

3- Types of ecological weathering: - a) ---------- b) ---------- c) ----------

4- Horizons of soil profile from upper to lower: *) ----------*) ----------
--*) ----------*) ----------*) ----------

	Final theoretical exam 2024/2025	
Botany & Microbiology Department	**Biotechnology program-level 3 General Ecology (BT309) (Credit hours)**	**Time: 2 hours** **Date: Thrusday:2/1/2025** **Marks: 50**
Name:		**ID:**

Answer the following questions

Q 1: - Put (√) for true statement and put (x) for false statement& correct it: (15 Marks)

1	Food chain is more realistic accurate than a food web.	
2	A scavenger is a carnivore that feeds on the bodies of living organisms.	
3	Saturation capacity is the percentage of quantity of moisture held by the soil when fully saturated.	
4	Pyramid of biomass represents the quantity of individual organisms present at each trophic level.	
5	Photosynthesis can occur in deep ocean water.	
6	Nutritional pyramids are the graphical representations that depict the relationships and interactions between various living organisms across different trophic levels in an ecosystem.	
7	A biological assemblage or taxa that provide information about the environment based on their presence or condition is called ecological indicators.	
8	I R is more abundant in high mountains than low levels in the same place.	
9	Macro-elements required in very small amounts.	
10	A biotic portion in each cycle is an exchange pool which is a larger, slow-moving.	
11	In gaseous cycle the reservoir is the air or the oceans.	
12	Intraspecific competition occurred among members of different species.	
13	The plant zero most used, has been 9.5°C.	
14	Ozone is present in mesosphere layer.	
15	Water cycle starts from oceans only.	

١٩

Final Exam
2024/2025

Botany&Microbiology Department | **Advanced virology (381B) (Credit hours)** | **Science Faculty Time: 2 hours**

Answer the following: [Total 50 marks]

Q1: Give the definitions <u>Eight only</u> for the following: (8 marks)

a- Adjuvant b-Vaccine c- siRNA d- Acquired immune
e- Haptens f- Antibodies

j- Polycistronic transcription h- Interferon i- DICER

Q2: What meant the following abbreviations (6 marks)

ICTV

ELISA

cDNA

HBV

HIV

CRISPER

Q3: Explain and draw <u>Three only</u> of the following: (24 marks)

1- Mechanism of siRNA silence
2- Rolling circle DNA replication
3- Role of biotechnology in production of anti-HBV vaccine
4- Mode of action CRISPER-Cas9 in *Streptococcus pyogens*
5- life cycle of Polioviruses

Q4: write on <u>Two only</u> of the following: (12 marks)

1- Spreading and control of human virus infection

3-Classification of viruses according to routes of transmission

4-Baltimore classification system

Best Wishes

Prof. Naeima Yousef

6. In bacterial protein toxins, the enzymatic component is active until it is released from the native (A+B) one. ( )

7. Carcinogenic potency of sterigmatocystin is estimated as 0.4 of that of aflatoxin B_1. ( )

Q3. Give the scientific term or scientific meaning for each of the following: (6 marks)

1. Secondary metabolites which are released outside the microbial cells and are considered as primary virulence factors.
2. The most fast death factor (MFDF) causes death within few minutes/hours.
3. Closely related tetrahydropurine compounds and are classified into 4 subgroups.
4. Trichothecenes having a ketone as a functional group at C-8.
5. The secondary metabolite produced by partial metabolism of afl. B_1.
6. The Ergot alkaloid which is medically used in obstetrics to prevent bleeding after child birth.

Q4. Show with illustration the chemical structure of 3 only of anatoxin-a, Lysergic acid, aflatoxin B_1 and patulin. Mention the main producing microorganisms and refer to their toxic effects. (15 marks)

Q5. Explain the action mechanism of 4 only of the following: (15 marks)

- Cholera toxin.
- Anatoxin-a(s).
- Zearalenone.
- Fumonisin B_1.
- Domoic acid.

Best wishes

Prof. Dr. Ahmed Lotfy El-Sayed

Continue from page 1 to 2

Assiut University
Faculty of Science
Botany&Microbiology Department

Date: January 18, 2025
The time allowed: 2 hours
Total mark: _____
50

First Semester final Examination
(Microbial toxins)
Students: (Biotechnology program)

Subject: Course ت ن 315

General Instructions: -Answer the following questions.

Q1. Choose the correct answer for each of the following: (7 marks)

1. What does the B subunit in AB toxin stand for?
   a. Accumulation b. Binding c. Adhesion d. Enzymatic activity

2. Which one of the following is the main producer of fumonisins in corn?
   a. *Penicillium citrinum* b. *Fusarium oxysporum* c. *F. virticilloides* d. *P. expansum*

3. Which one of the following causes oesophageal cancer?
   a. Patulin b. Zearalenone c. Aflatoxin B_1 d. Fumonisin B_1

4. What is the range of LD_{50} (ug/Kg) of microcystins?
   a. 10-20 b. 20-50 c. 50-100 d. 100-200

5. Which one of the following causes hallucination and agitation?
   a. Lysergic acid b. Afl. M_1 c. Ochratoxin A d. Aspertoxin

6. Which one of the following toxins utilizes NAD as a substrate?
   a. Cholera b. Diphtheria c. Anthrax d. H_2S

7. Which one of the following shows specific binding to a site-5 of voltage sensitive Na^+ channels?
   a. Okadaic acid b. Domoic acid c. Nodularin d. Brevetoxins

Q2. Place a tick √ or X in front of each of the following: (7 marks)

1. Ochratoxin A is derived from Pentaketides. ( )
2. In Fumonisin B, OH groups at C10 and C15 on its hydrocarbon chain are esterified with propane tricarboxylic acid. ( )
3. Water content in grains is the limiting factor of mycotoxins formation in these grains. ( )
4. Nodularin inhibits protein phosphatase 1 and 2 in liver. ( )
5. Self-depuration is an effective mean to get rid of marine toxins, but it's expensive and needs long time. ( )

Continue from page 1 to 2

١٧

V. Choose the correct answer for 10 only of the following (10 Marks)

1. Antibacterial agent inhibits the growth of bacteria by inhibiting protein synthesis
   a. Gentamicin b. Chloramphenicol
   c. Amphotericin B d. Vancomycin
2. The stage in which the host going to be recovered
   a. Convalescence b. Decline phase c. Incubation period d. Acute illness
3. Kinases are enzymes produced by the host to dissolve the clots around the infection
   a. True b. False
4. A body fluid which has normal microbiota
   a. Blood b. Saliva c. Urine d. All the above
5. Which of the following is the causal agent of Kerion?
   a. *Aspergillus flavus* b. *Trichophyton mentagrophytes*
   c. *Candida albicans* d. *Trichophyton schoenleinii*
6. Incubation period for influenza virus is .....
   a. Two years b. Few weeks c. Two months d. Few days
7. Leucopoenia, Inflammation and Lymphadenopathy are .....
   a. Human immune cells b. Receptors
   c. Immune response d. Antigens
8. Fungal disease of the outermost layers of the skin is called .....
   a. Mycetoma b. Dermatomycotic fungi
   c. Dermatomycosis d. Fungemia
9. If we inoculated 200 test animals with different numbers of microbial cells, which one of the following is called ID50
   a. The number which killed all animals
   b. The number which infected 50 animals
   c. The number which infected all animals, but killed 100
   d. The number which infected 100 animals, but killed 30
10. A stage of HIV causing severe damage to the human immune system
    a. Advanced infection b. Acute illness
    c. Latent infection d. Asymptomatic period
11. Which of the following is required for pathogenesis in corona virus?
    a. Opa protein b. E protein c. RNA d. Spike protein

"انتهت الأسئلة"

Best Wishes **Dr. *Nemmat A. Hussein***

Assiut University
Faculty of Science
Department of Botany & Microbiology

جامعة أسيوط
كلية العلوم
قسم النبات والميكروبيولوجى

3rd level (Microbiology & Botany Students)
Pathogenic Microorganisms (397B)

Final exam: 18th Jan 2025
Time allowed: 2 hours

Answer the following questions **(50 Marks)**

I. Write on 4 only of the following (10 Marks)

1. Signs and symptoms of a respiratory tract infection
2. Normal microbiota in the oral cavity
3. How do pathogens enter the body?
4. Risk factors of Candidiasis
5. Classification of Hepatitis viruses and describe their modes of transmission

II. Give the reason(s) for 5 only of the following (10 Marks)

1. Recently, physicians became more interesting in fungal diseases that in the past time.
2. It is very difficult or even impossible to treat kuru disease.
3. Normal microbiota may cause diseases
4. *Streptococcus pneumoniae* don't cause disease, if it is swallowed.
5. Stomach harbors small number of normal microbiota
6. Bladder infection by *Escherichia coli* is more frequently in woman than man

III. Define 5 only of the following scientific terms: (10 Marks)

1. Syndromes
2. Passive vaccine
3. Subclinical infection
4. Inflammation
5. Fungemia
6. Endogenous infection

IV. Write one example for 10 only of the following: (10 Marks)

1. Causal agent of atypical pneumonia.
2. Antifungal drug inhibits ergosterol synthesis.
3. Stomach normal microbiota.
4. Microbial disease transmitted via droplets.
5. Bacterial pathogen produces neurotoxin.
6. Sign of meningitis.
7. Disease caused by *Microsporum canis*.
8. Protozoan disease
9. Geophilic pathogen
10. Virulence factor of *Neisseria gonorrhoaea*
11. Chemical barrier against microbial infection

2–Most chloroplasts in plant cell contain 100-1000 grana. ( )

3- Plastids of plant cell contain Ribosomes (70S), circular DNA, RNA and soluble enzymes of Calvin cycles are also present in ( )

4- The endoplasmic reticulum is only present in the eukaryotic cells. ( )

5- Golgi apparatus is involved in the packaging of the protein molecules before they are sent to their destination. ( )

6- The function of cell wall is modifying proteins and lipids. ( )

7- Endoplasmic reticulum provides an increased surface for various enzymatic reactions. ( )

8- Chloroplasts are the centers of synthesis and metabolism of carbohydrates. ( )

Good luck

DR/ MAYSA M. A. ALI

Assiut University
Faculty of Science
Botany & Microbiology Dept.
Date: 13/12/2024
Course code: 323 B

Final exam of: Plant Cytology
Year: 2024/2025
Time: 2 hours
Total marks: 50 marks

Answer all the following questions

(A) Write on all of the following (20 marks, 4 for each):

1- The model of **Singer and Nicolson (1972)** to explain the structure of plasma membrane

2- The chemical nature cell wall in plant cell

3- Cells Theory (Schleiden and Schwann, 1882)

4- The composition of protoplasm in plant cell

5- Function of proteins in plasma membrane of plant cell

(B) Compare between all of the following (16 marks, 4 for each):

1- Peripheral proteins & Integral proteins of plasma membrane

2- Rough & smooth endoplasmic reticulum (Function)

3- Primary cell wall & secondary cell wall of plant cell

4- Leucoplas and Chromoplast

(C) Defined all of the following (6 marks, 1.5 for each) :

1- Plasmodesmata

2- Phragmoplast

3- Vacuole of plant cell

4- Half bordered pits

(E) Use (√) or (X) for each of the following (8 marks , 1 for each :

1- Mitochondria play a role in regulating the internal environment of the cell by controlling the concentration of ions and metabolites. ( )

10

4. In humid regions the amount of rainfall ranged between ..... (1 mark)

a-10 -20 inch b- 5 -10 inch c- 40 -80 inch

5. Vertical decrease in temperature is about ..... times of the horizontal. (1 mark)

a- 10 b- 100 c- 1000

6. The interactions among organisms termed ..... (1 mark)

a- Action b- reaction c- coactions

7. Plants growing on other plants are called ..... (1 mark)

a-endophytes b- epiphytes c- Phytoplankton

8. Seeds germination while still within the fruits and attracted to the parent is termed ..... (1 mark)

a-epigeal b- viviparous c- hypogeal

9. ..... Barriers include oceans, lacks, rivers, mountain ranges and deserts. (1 mark)

a-Biological b- Physical c- Topographical

10. All diaspores may fall to the ground by ..... (1 mark)

a-wind b- gravity c-water

11. ..... developed on mud flats which are exposed to low tide. (1 mark)

a-Mangrove forest b- Monsoon forests c- Boreal forests

12. ..... The condition in which a species is unique to a particular geographic area and is not found any - where else in the world. (1 mark)

a-Biogeography b- Endemism c- Biodiversity

Good Luck

Prof. Dr. Suzan A. Sayed

	First Semester Final Examination: 2024- 2025 Biogeography Course No. 341B 50 marks		
Botany and Microbiology Department	Third Level: Botany Date: / 1 / 2025	Time allowed: Two Hours	Assiut University

Answer the Following questions:

1- Discuss briefly THREE ONLY of the following: (18 marks)

a. The principles concerning perpetuation and evolution of floras in relation to plant geography. (6 marks)

b. Köppen climate classification. (6 marks)

c. Criteria for indication of center of origin. (6 marks)

d. Types and areas of natural distribution. (6 marks)

2- Compare between each two of the following (answer THREE ONLY): (21marks)

a. Tundra and savanna grasslands. (7 marks)

b. Tropical rain forest and temperate deciduous forest. (7 marks)

c. Drought-sensitive and drought resistant plants. (7 marks)

d. Vicarious areas and relic areas. (7 marks)

3- Choose the correct answer: (11 marks)

1. ..... is defined as the range of conditions under which the species can survive. (1 mark)

   a- The habitat b- The ecosystem c- The ecological amplitude

2. Various biotypes are subjected to environmental selection and thus become ..... (1 mark)

   a-new genotypes b- endemics c- ecotypes

3. ..... are desert annuals that germinate after heavy rainfall to leach out the inhibitors and to support growth. (1 mark)

   a-Arido-passive b- Arido-active c- Arido- tolerant

Please turn the page