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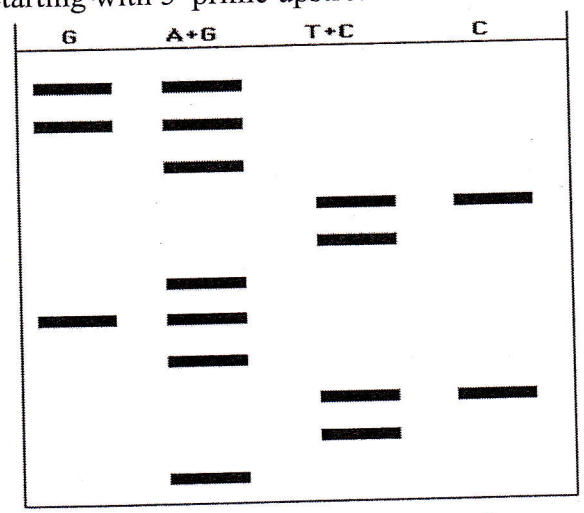
| كلية العلوم جامعة أسيوط | **Assiut University – Botany and Microbiology department**<br>**Final Exam (2024) for 2nd level students**<br>**Molecular Biology (212 B)**<br>**Time allowed: 2h** **Total Marks:50** | جامعة أسيوط |

**Answer the following questions (3 PAGES)**

**I. Write on all the following:** **(21 Marks)**

1. The main features of a vector used in gene cloning.
2. In a DNA molecule, the number of base pairs linked together by double hydrogen bonds equals **half** the number of that joined by triple hydrogen bonds, if there are 300 cytosine bases in the DNA molecule, give the following: (a) number of purine bases, (b) Percentage of pyrimidine bases, and total number of bases in the molecule.
3. How can you detect the insertion of the target gene in the vector?
4. From the following diagram, write the name of the technique and interpret the illustrated results starting with 5′ prime upstream.




5. The main requirements for the primer for effective PCR reaction.
6. How can we benefit from the universal genetic code in the synthesis of human insulin using bacteria?
7. What is the effect of UV irradiation on the structure of the DNA and how the cell can repair the damage?

**II. Give one difference between 6 only of the following:** **(9 Marks)**

1. Gene structure in Eukaryotes and Prokaryotes
2. Plasmid & Cosmid.
3. Different models of DNA
4. Rho- dependent & Rho-independent transcription termination.
5. Transition and transversion mutation.
6. Ribosomes in Prokaryotes and Eukaryotes.

7. Silent and non-sense mutation.
8. A and P sites in the ribosomes.

**III. Give the biological function of <u>10 only</u> of the following:** **(10 Marks)**

| | | | | | |
|---|---|---|---|---|---|
| **1** | Restriction enzymes | **2** | Transformation | **3** | Reverse transcriptase |
| **4** | Gel electrophoresis | **5** | DNA Polymerase I | **6** | Histone proteins |
| **7** | tRNA anticodon | **8** | Spliceosomes | **9** | Dideoxynucleotides |
| **10** | AUG codon | **11** | Aminoacyl-tRNA synthetase | **12** | DNA glycosylase |

**IV. Choose the correct answer for <u>20 only</u> of the following:** **(10 Marks)**

**1. What does AGGGTT means?**

a. The initiation code of translation
b. The origin of transcription
c. The hexametric sequence of telomere
d. The hexametric sequence of telomerase

**2. In the Eukaryotic gene, the untranslated region occurs either upstream or downstream.**

a. True
b. False

**3. Which of the following is called palindromic sequence?**

a. 5'-GGATCC-3'
5'-CCTAGG-3'
b. 5'-GGATGG-3'
3'-CCTACC-5'
c. 5'-GGATCC-3'
3'-CCATGG-5'
d. 5'-GGATCC-3'
3'-CCTAGG-5'

**4. Which of the following has not a role in gene expression.**

a. Replication
b. Transcription
c. Translation
d. All are important.

**5. Lac-Z is .....**

a. The enzyme participates in transcription process.
b. The gene of blue colour in non- recombinant plasmid.
c. The enzyme responsible for joining Okazaki fragments.
d. The gene of white colour in recombinant plasmid.

**6. Polyadenylation takes place in .....**

a. Primary transcript at downstream.
b. Mature mRNA at upstream.
c. Gene beside promoter.
d. The termination of replication.

**7. The DNA replication is continuous in one strand and discontinuous in the other.**

a. True
b. False

**8. Separation of the two strands of DNA is catalyzed by .....**

a. Helicase
b. Ligase
c. Gyrase
d. restriction enzyme

**9. If the sequence of template strand is 5′-GCTAAGTA-3′, what is the complementary sequence of mRNA to be transcribed?**

a. 3′-GCTAAGTA-5′
b. 3′-CGAUUCAU-5′

c. 5′-CGAUUCAU-3′ d. 3′-CGATTCAT-5′

**10. ..... modifies the bacterium's own GAATTC sites, so they are not targets of EcoRI.**

a. Ligase b. Endonuclease c. Methylase enzyme d. Esterase

**11. Circular chromosome is present in .....**

a. Plasmid b. Mitochondria c. *E. coli* d. All the above

**12. The bacterial DNA .....**

a. is monocystronic b. has operons c. has exons d. All the above

**13. When the amino group of adenine is changed to imino group, the process is known as .....**

a. Tautomerism b. Deamination c. Depurination d. Transition

**14. What is the role of the probe in Southern blotting?**

a. To detect and bind to DNA template b. To amplify DNA

c. To transfer DNA from gel to membrane d. To digest DNA

**15. The purpose of DNA denaturation in Southern blotting is.....**

a. To make it more easy to handle b. To add a radioactive label

c. To destroy DNA c. To make single stranded DNA

**16. Sanger sequencing reaction is carried out in .....**

a. Two tubes b. Four tubes c. Six tubes d. Eight tubes

**17. When the codon is altered to code a different amino acid, the mutation is .....**

a. Silent b. Nonsense c. Missense d. None of the above

**18. A type of mutation that affect every codon beyond the point of mutation is .....**

a. Point mutation b. Frameshift mutation

c. Chromosome mutation d. Silent mutation

**19. Which of the following statements is accurate for PCR?**

a. Automated PCR machines are called thermal cyclers.

b. A thermostable DNA polymerase is required.

c. Millions of desired DNA copies can be produced from microgram quantities of DNA.

d. All the above.

**20. Which of the following is the first and the most important step in PCR?**

a. Annealing b. Primer extension c. Denaturation d. None of the above

**21. In translation, this is not an essential component**

a. Amino acid b. Ligase c. mRNA d. Anticodon

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***Best wishes..... Prof. Nemmat A. Hussein & Dr. Mohamed Gomaa***

Assiut University
Faculty of Science
Botany Department

Date: May 30 , 2024
Time allowed: 2 hours
Total mark: _____
50

First Semester final Examination
(Bacteriology)
Students: (Biotechnology)

Subject: Course 203BT

**General Instructions:-Answer ONLY FIVE QUESTIONS of the following. Use well labeled diagrams where appropriate. Write your answer in space provided. (10 Marks each question).**

**Q1. Place a tick √ in the correct answer. (1/2 mark each)**

1. A distinguishing feature of archea is that they:
   a) have cell contain peptidoglycan
   b) have pseudomurine
   c) have cell wall containing mycolic acid
   d) have cell wall containing dipicolinic acd acid

2. Which of the following structures is never present in a prokaryotic cell?
   a) cell wall
   b) magnetosomes
   c) ribosome
   d) membrane-bound nucleus

3. The rigidity and shape of the bacterial cell is due to the:
   a) Cell membrane
   b) Peptidoglycan layer
   c) The lipopolysaccharide
   d) The teichoic acid layer

4. A gliding motion is a characteristic of
   a) *Spirillum*
   b) *Bacillus*
   c) *Spirochetes*
   d) *Cytophaga*

5. Most of pathogenic bactria are called:
   a) Mesophiles
   b) Thermophiles
   c) Psychrophiles
   d) Halophiles

6. UV radiation is antimicrobial because
   a) The radiation generates significant amounts of heat within the given cell
   b) The energy causes thymine dimmers in the DNA molecule.
   c) The radiation generates magnetic poles which denature the cellular components
   d) The radiation produces reactive hydroxyl radical

7. For growth, a mutant bacterium requires that an amino acid not required by the wild parental strain be added to the growth medium is called
   a) chemolithotoph
   b) auxotroph
   c) heterotroph
   d) chemorganotroph


**Continue from page 1 to 6**

8. Chemotaxis is
   a) the use of an inorganic chemical as an energy source
   b) the form of energy that powers the bacterial flagellum
   c) an increase in the internal osmolarity of a cell
   d) movement by a bacterium in response to a chemical stimulus

9. Which of the following substances is not truly a trace element required for growth of bacteria?
   a) Cobalt
   b) Molybdenum
   c) Copper
   d) Iron

10. The interpeptide bridge of Gram-positive bacteria connects
   a) Diaminopimelic acid to D-alanine
   b) L-lysine to D-alanine
   c) L-lysine to D-glutamate
   d) Diaminopimelic acid to D-lysine

**Q2. State the position, Composition and Function of each of the following: (10 Marks)**

| Name | Position | Composition | Function |
|---|---|---|---|
| **a. Pili** | | | |
| **b. Gas vesicle** | | | |
| **c. Carboxysome** | | | |
| **d. Chlorosome** | | | |
| **e. Capsule** | | | |



**Continue from page 1 to 6**

**Q3. a. What is meant by chemoautotrophic bacteria? ( 2 Mark)**

**b. Describe four groups of chemoautotrophic bacteria (8 marks)**



**Continue from page 1 to 6**

**Q4. Give reasons for each of the following (10 Marks):**

a. **Why psychrophilic bacteria have the ability to cause food spoilage in refrigerator?(4 Marks)**

b. **Why thermophilic bacteria are able to live and adapt temperature above 45 $^{0}$C?(3 Marks)**

c. **Why obligate anaerobic bacteria killed by exposure to oxygen?(3 Marks)**



**Continue from page 1 to 6**

**Q5. Compare and contrast between cell wall of Gr+Ve and G-Ve? (10 Marks)**



**Continue from page 1 to 6**

**Q6. Compare and contrast between vegetative and endospore cells. (10 Marks)**

| Property | vegetative | Endospore |
|---|---|---|
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**Continue from page 1 to 6**

Department of Botany and Microbiology
Faculty of Science
Assiut University

Final Exam. For the 2nd level students (Microbiology and Chem.&Micro. ), May 2024.
Subject: Systematic Mycology 1 (261 B) Maximum Allowed Time: 135 Min.

## Answer The Following Questions:- (Note: 5 pages should be considered)

**Q.1: Name and describe briefly with illustration the five general ways in fungi by which the compatible nuclei are bring together:-** (5 Marks)

**Q.2: At what stage do slime molds lack a cell wall and at what stage do they have cell walls?.** **(2 Marks)**

**Q.3: What are differences in sporangium and zoospore development and/or release between *Pythium* and *Phytophthora* (Illustrate your answer)?** **(3 Marks)**

**Q. 4: Differentiate a rhizomycelium from a true mycelium. Which order(s) of Chytridiomycota has rhizomycelium and which has true mycelium?** **(3 Marks)**

**Q.5: What are two ways that the Entomophthorales differ from members of the Mucorales?.** **(2 Marks).**

**Q.6: Circle the correct answer and write the correct answer if it is missing :-** **( 7 Marks)**

**1- The dichotomously branching of suspensor appendages is characteristic feature for**

a- *Phycomyces* b- *Absidia* c- *Zygorhynchus* d- None of all (.....)

**2- The oogonium and its attending antheridiidial branch originating on the same hypha is called**

a- Amphygynous b- Diclinous c- Exigynous d- Monoclinous e- None of all (.....)

**3- The fungal reproductive units which are produced by transformation of pre-existing cells of the thallus is referred as**

a-Zoospores b- Conidia c- Sporangia d- Thallospores f-None of all (.....)

**4- Fungi which are characterized by multiflagelated zoospores**

a- *Olpidium* b- *Synchytrium* c- Myxomycota d- Oomycota e- None of all (.....)

**5- The fungal thallus attaching several hosts**

a- Epibiotic b- Endobiotic c- haplobiontic d- None of all (.....)

**6- Sporangioles (containing 2-6 spores) and non-collumellate sporangia are the main the characteristic features of:-**

a- *Rhizopus.* b- *Pilobolus.* c- *Thamanidium.* d – *Absidia.* e- All of the above.

**7- Elongated merosporangia are the main diagnostic feature for:-**

a- *Cunninghamella.* b- *Saprolegnia.* c- *Syncephalastrum.* d- *Blakselea*

**Q.7: Give the scientific term or the organism name which is related to 10 only of the following (Put your answers in the next table):- (10 Marks)**

**1- The order in which the hyphae are constricted at regular intervals and one of the related genus is known as the sewage fungus.**
**2- The fungal species which is characterized by sexual spore's suspensors with circinate filaments.**
**3- The obligate parasite fungus inhabiting the body cavity of *Mosquito* larvae.**
**4- The chytrid thallus in which the zoospores are released through a lid remaining attached to one edge of the papilla.**
**5- The aggregation of unicellular, uninucleate naked amoeboid cells which represents the vegetative structure of some slime moulds.**
**6- Fusion between motile male gamete and immotile female one.**
**7- A fungal species which could be used as bioagent for nematode control.**
**8- The fungal species which produce two forms of zoospores in their life cycle.**
**9- Oospores in which there is no space between oospore wall and oogonium wall.**
**10- The repeated emergence of the secondary or principal zoospore in some fungal spp.**
**11- Clavate zoosporangium and the included zoospores are released by disintegration of sporangial wall.**
**12- The antheridial branch originating from the oogonial cell above the basal septum.**

**(Give your answers in the following table):-**

| No | Answer | No | Answer |
|---|---|---|---|
| 1 | | 2 | |
| 3 | | 4 | |
| 5 | | 6 | |
| 7 | | 8 | |
| 9 | | 10 | |
| 11 | | 12 | |

**Q. 8: Define briefly four only of the following, illustrate and name the related organisms whenever possible (Answer four points only): (8 Marks)**

**1- Antheridiol:**

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

2- **Merosporangium:**

3- **Polyplantism:**

4- **Centric oospores:**

5- **Pseudoconidia or Chlamydospores (Define only one)**

6- **Amphigynous antheridia:**

**Q.9: Give Only One Difference between each of the following (5 points only) ( 10 Marks)**

| | Primary plasmodium | Secondary plasmodium |
|---|---|---|
| 1 | | |

| | | |
|---|---|---|
| 2 | **Gonapodiaceae** | **Monoblepharidaceae** |
| 3 | **Pythiaceae** | **Albuginaceae** |
| 4 | **Subgenus: *Euallomyces*** | **Subgenus: *Brachy-Allomyces*** |
| 5 | ***Zygorhynchus*** | ***Phycomyces*** |
| 6 | ***Plasmopara*** | ***Peronospora*** |

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***The Best Wishes (Prof. Abdel-Raouf Khallil & Dr. Ghada Abdel-Monsef)***

Assiut University
Faculty of Science
Botany & Microbiology Department
Jun. 2024

Course code: 232B
Course: **Taxonomy of flowering plants**
2nd Semester – Final Exam
Time: 2 Hours

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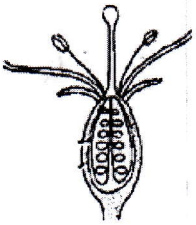
## The first question:- (18 marks)

**Choose the correct answer, put your answer in the table: - (1.0 mark each)**



1. **Ovary of the corresponding picture is called: -**
   a. inferior b. superior c. semi-superior d. semi-inferior
2. **The arrangement of sepals & petals in bud is known as:-**
   a. aestivation b. placentation c. duration d. modification
3. **If the sepals become colored like petals, it is called as:**
   a. sepaloid petals b. petaloid calyx c. tepals d. perianth
4. **non-functional stamens are called as:**
   a. stamenal tube b. fertile stamen c. staminodes d. none of the preceding
5. **A condition when filaments & anthers are fused is known as:-**
   a. syngenesious b. synandrous c. syncarpels d. adelphous
6. **When dichasial cyme ends into monochasial cyme, it is called as:-**
   a. biparous b. cincinus c. verticillaster d. uniparous
7. **In raceme, the flowers arranged in succession called:-**
   a. basipetal b. acropetal c. centrifugal d. separate
8. **Cymose inflorescence with many lateral branches bearing flowers is:-**
   a. monochasial b. dichasial c. polychasial d. verticillaster
9. **Fruit with single seed and pericarp fused with testa is called:-**
   a. caryopsis b. achene c. urticle d. nut
10. **Legume type of fruit is usually found in the family:-**
    a. Compositae b. Apiaceae c. Gramineae d. Fabaceae
11. **The edible part of banana is:-**
    a. meso- & endocarp b. epi- & mesocarp c. epicarp d. pericarp
12. **The seedless fruits are called:-**
    a. endocarpic b. schizocarpic c. parthenocarpic d. noncarpic
13. **The correct scientific name of Mango (المانجو) plant:-**
    a. *Mangifera sp.* b. *Mangifera indica* c. *Mangifera indica* L. d. all the preceding
14. **Four o'clock family that characterized by a petaloid tepals is:-**
    a. Lamiaceae b. Apiaceae c. Fabaceae d. Nyctaginaceae
15. **The plant family that characterized by papilionaceous flowers is called:-**
    a. Fabaceae b. Caesalpiniaceae c. Mimosaceae d. Brassicaceae
16. **Which of the following plants is belonging to family Chenopodiaceae:-**
    a. *Papaver somniferum* b. *Bougainvillea glabra* c. *Spinacia oleracea* d. *Gypsophila elegans*
17. **The plant family that characterized by umbel inflorescence and inferior ovary is called:-**
    a. Apiaceae b. Oleaceae c. Rosaceae d. Scrophulariaceae
18. **Which of the following plants is belonging to subfamily Rosoideae:-**
    a. *Rosa sp.* b. *Prunus armeniaca* c. *Pyrus malus* d. all the preceding

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| 18 | |

**The second question:-** **(17 marks - 1.0 mark each)**

Put (√ ) beside the correct answer and put (X) beside the wrong answer:-

| | |
|---|---|
| Apocarpous condition refers to the presence of many united carpels | ( ) |
| Axile placentation present in unilocular, bicarpellary ovary | ( ) |
| Isostemenous stamens arranged in two whorls, outer whorl is opposite petals | ( ) |
| spiral arrangement is a primitive character | ( ) |
| Colored bract called spathe is associated with spadix | ( ) |
| Corymb with successive lateral branches develops on same side | ( ) |
| Syconium is a dichasial cyme, which is reduced into two scorpioid cymes | ( ) |
| Berry is a fruit which is commonly dry | ( ) |
| Siliqua fruit splits open along two sutures, from apex to base | ( ) |
| The aggregate fruit develops from a single flower | ( ) |
| Takhtajan proposed a phylogenetic system for plant systematic | ( ) |
| Brassicaceae is characterized by cross-like petals | ( ) |
| The stem of family Cyperaceae is hollow, rounded | ( ) |
| Scrophulariaceae sometimes has 5-bilabiate petals (upper & lower lip) | ( ) |
| *Gossypium barbadense* is belonging to family Malvaceae | ( ) |
| *Nerium oleander* is belonging to family Apocynaceae | ( ) |
| *Phoenix dactylifera* is belonging to family Arecaceae | ( ) |

**The third question:-** **(15 marks)**

**(i) Draw an illustration showing (4) types of racemose inflorescence ( 2 marks)**

**(ii) Compare the following categories :- ( 4 marks)**

**a. - Rosoideae & Pyroideae**

**b. Mimosaceae & Fabaceae**

**(iii) Describe the floral characteristics of family Papaveraceae with floral diagram. Enumerate 2 of the important plants. ( 5 marks)**

**(iv) Give 1 botanical name and family of oil seed, vegetable, pulse, cereal & medicinal plants. ( 5 marks)**

(ملحوظة : الاسم العربي للنبات ليس له درجات)

Best Wishes

Prof. Momen Zareh

Assiut University
Faculty of Science
Botany and Microbiology Department

جامعة أسيوط
كلية العلـــوم
قسم النبـــات والميكروبيولوجى

Course name: **Enzymes and Hormones** Course number: **252 B**

**Final Exam., May 2024** **(50 Marks)**

| الإسم: | رقم الجلوس: |
|---|---|

I- **Choose the correct answer** (10 Marks, one point free):

| | |
|---|---|
| **1.** | The term apoenzyme is applicable to<br>(a)- Protein primary structure (b)- Protein part of an enzyme<br>(c)- Organic coenzyme (d)- Inorganic cofactor of the enzyme |
| 2. | All the following equations are correct except:<br>(a)- E + S ↔ ES complex → E + P (b)- E + I ↔ EI complex → E + I<br>(c)- E + I ↔ EI complex→ XXX (d)- E + S + I ↔ ES + EI → E + P + EI |
| 3. | Oxygen is essential for production of (a)- GA3 (b)- IAA (c)- ethylene (d)- a and c. |
| 4. | A chemical compound that inhibits an enzyme-catalyzed reaction by binding to its active site is called (a)- inhibitor (b)- allostric inhibitor (c)- competitive inhibitor (d)- none of the above. |
| 5. | Enzymes that catalyze intramolecule rearrangement within a single molecule are:<br>(a)- transferases (b)- isomerases (c)- hydrolases (d)- a and b. |
| 6. | ATP synthase locates in (a)- thylakoid membranes (b)- cristae of mitochondria<br>(c)- a & b (d)- neither a nor b. |
| 7. | Lyases catalyze (a)- non-hydrolytic addition (b)- non-hydrolytic removal (c)- hydrolytic cleavage (d)- a and b. |
| 8. | Denaturation of enzymes occurs (a)- at un-optimum pHs (b)- at freezing temperatures<br>(c)- as disruption of hydrogen, electrostatic and hydrophobic bonds (d)- a and c. |
| 9. | All enzymes have:<br>(a)- Same pH and temperature optima<br>(b)- Same pH but different temperature optima<br>(c)- Different pH but same temperature optima<br>(d)- Different pH and different temperature optima |

الدرجة من خمس صفرات !

| | |
|---|---|
| 10. | (a)- Ethylene (b)- ABA (c)- GA (d)- Auxin is inhibited upon oxidation to phaseic acid. |
| 11. | An allosteric enzyme possesses:<br>a) An active site and an allosteric site b) Active site only<br>c) Allosteric site only d) Two allosteric sites |
| 12. | Dormancy of buds is induced by (a)- ethylene (b)- auxins (c)- abscisic acid<br>(d)- a or c |
| 13. | Dormancy of seeds is broken by (a)- ethylene (b)- abscisic acid (c)- auxins<br>(d) a and b. |
| 14. | IPP is the key compound in the synthesis of (a)- GA (b)- cytokinin (c)- ethylene<br>(d)- a and b. |
| 15. | IPP (a)- starts by 2 acetic acid molecules (b)- is 5 carbon atoms compound (c)- oxidizes to mevalonic acid – (d)- all of them. |
| 16. | (a)- Gibberellins (b)- ABA (c)- Ethylene – (d)- Cytokinins overcome dwarfism in plants. |

**II. Put a (√) in front of the correct sentence or (X) in front of the wrong one; correct the underlined word(s) only, if wrong (5 Marks, one point free):**

| | | |
|---|---|---|
| 1. | Higher Km values (Michaelis-Menten constant) mean **higher** affinity of an enzyme to its substrate | |
| 2. | Every enzyme-catalyzed reaction attains a steady state due to<br>**saturation** of its active sites. | |
| 3. | The compounds that inhibit the enzyme activity **and similar** to their substrates are called uncompetitive inhibitors | |
| 4. | Every enzyme code consists of the letters "EC" (Enzyme Commission) followed by **four numbers separated by periods**. | |
| 5. | **Ligases** are polymerizing enzymes | |

| | | |
|---|---|---|
| 6. | Metabolic regulation takes place by **coarse and fine** adjustment | |
| 7. | Specificity of the enzyme to its substrate is classified into **three** types. | |
| 8. | The movement of auxin is **lateral** movement | |
| 9. | The most common form of naturally occurring cytokinin in plants today is called **zeatin** which was isolated from corn (*Zea mays*). | |
| 10. | **Photoperiodism** divides flowering of plants to long-day (short-night), short-day (long-night) or neutral plants. | |
| 11. | In gravitropism, auxin moves towards the cells on the bottom side of the root, such high concentrations suppresses growth on the **lower** side. | |
| 12. | Exogenous application of ethylene **accelerates** leaf senescence. | |
| 13. | **ABA** is synthesized in all types of cells that contain chloroplasts or other plastids. | |
| 14. | Free ABA can be **activated** by covalent conjugation with some simple sugar molecule such as glucose. | |
| 15. | Hormones are synthesized in **certain** cells and transport to sites of action | |
| 16. | All free forms of phytohormones are **more** active than the bound ones | |

**III. Write down the scientific term best expresses the following information (10 marks, one point free):**

| | | |
|---|---|---|
| 1. | Enhancement of the enzyme activity by a product in a reaction cascade | |
| 2. | A site, other than the active site, at which a chemical compound binds and enhances or inhibits the feed forward or feedback of an enzyme-catalyzed reaction | |
| 3. | .....changes in an enzyme protein molecule can occur in response to interactions with other molecules such as substrates, substrate analogs or coenzymes. | |
| 4. | In response to one sided light, plants undergo curvature towards the light source; this is called..... | |
| 5. | The type of inhibition that slows the production line when products begin to build up. | |
| 6. | The enzyme class "EC.3", which uses water as part of its catalyzed reactions is called .... | |
| 7. | One of the recent growth promoting hormones is .... | |
| 8. | The energy in Kcal/mole required to convert one mole of substrate is known as..... | |
| 9. | Moles of substrate converted to product per second per mole of the active site of the enzyme | |
| 10. | A biological catalyst works only at physiological conditions | |
| 11. | Fruits formation without fertilization or seeds. | |

**IV. Rearrange the following events by adding the relevant number in the empty brackets (5 marks):**

1. **In an enzyme catalyzed reaction**, the events occur in the following order: ( ) Conformational changes of the active site - ( ) collision of substrate molecules with enzymes - ( ) fitting of substrate molecules into the active sites – ( ) activation energy is lowered - ( ) [ES] complex - ( ) E +P.

2. **In acid growth**, the events occur in the following order: ( ) Turgor pressure presses the loose cell walls to enlarge - ( ) Auxins activate proton pumps - ( ) Secretion of $H^+$ outside the cell - ( ) Cells become turgid - ( ) acidic pH activate expansins - ( ) Expansins loosen cell wall components by hydrolysis.

3. **In germination**, the events occur in the following order: ( ) Water imbibition – ( ) Secretion of hydrolases from the aleurone layer - ( ) GA3 release from the embryo - ( ) Hydrolysis of food reserves - ( ) germination - ( ) Utilization of hydrolysates (sugars, amino acids, etc.).

4. **In abscission**, compounds are formed in the following order: ( ) abscisic acid – ( ) Hydrolases form separation layer - ( ) ethylene - ( ) Phellogen formation.

5. **In leaf senescence,** ( ) Old leaves fall - ( ) cytokinins induce younger leaves to act as sinks for metabolites ( ) – Old leaves starve - ( ) Chlorophyll, proteins and DNA degrade in old leaves

**V. Fill in the spaces utilizing the relevant number(s) (5 marks):**

a. tropisms b. parthenocarpy c. leaf epinasty d. flowering e. apical dominance f. abscission

g. amylase secretion h. cell division, i. metabolic sinks, j. fruit ripening, k. delay of scenecence

l. senescence. m. stomatal closure

1. Auxins induce .....
2. Gibberellins induce....
3. Cytokinins induce .....
4. Ethylene induces .....
5. Abscisic acid induces.....

24
5
19

**Best wishes,**

**Prof. Dr. Refat Abdel-Basset**

Assiut University
Faculty of Science
Botany & Microbiology
Department

Paper exam second Level
Course Code: 291 B
General Microbiology
Allowable Time: 2 hour

## Answer All the Following Questions:

**I. Answer by True (T) or False (F) in the Following Statements [10 Marks "One mark for each"]:**

| | |
|---|---|
| **1.** Conversion of diaminopimelic acid into lysine by *Aerobacter* decarboxylase. | (T) & (F) |
| **2.** Tea is a Leaves-based fermented food, while cheese is a Dairy-based fermented food. | (T) & (F) |
| **3.** Antibiotics classified according to their mode of action, chemistry, and origin. | (T) & (F) |
| **4.** By-products from industries are employed in fermentation because of their lower cost. | (T) & (F) |
| **5.** Ideal volume of the medium in growth vessels must be 1/5 for good aeration. | (T) & (F) |
| **6.** Fermentation process can be done by fungi only under anaerobic conditions. | (T) & (F) |
| **7.** Saprophytic fungi obtain their foods from their host or living organisms. | (T) & (F) |
| **8.** Surface fungal cultures give homogenous growth. | (T) & (F) |
| **9.** All fungi prefer same temperatures. | (T) & (F) |
| **10.** Cu is a macroelement for synthesizes the fungal cytochromes and enzymes activity. | (T) & (F) |

**II. Select the most correct answer in the following [10 Marks "One mark for each"]:-**

**11. Effect of light on fungi includes fungal**.....

**a)** morphology and physiology **b)** movement **c)** development **d)** all choices are correct

.....

**12. Production of glycerol is usually done by chemical synthesis or fermentation processes using**.....

**a)** *E. coli* **b)** *Asperigllus niger* **c)** *Penicillium notatum* **d)** *Candida glycerinogenes*

.....

**13. All bioprocess have** ..... .....**limiting points.**

**a)** One **b)** two **c)** three **d)** four

.....

**14. You can detect and determine the fungal growth rate by**..... **method.**

**a)** Soil method b) Mineral oil c) dry weight d) Total sterols

.....**Look Back**.....

**15. Aspergilli growth curve have ... ..... growth phases**

**a)** three **b)** seven **c)** four **d)** five

.....

**16. Mixed pickle is a sort of ..... fermented food.**

**a)** Vegetable-based **b)** Bean-based **c)** Fish-based **d)** all choices are correct

.....

**17. *Saccharomyces cerevisiae* mainly used in industry to produce.....**

**a)** Baker yeast and Ethanol **b)** Amino Acids **c)** Methanol **d)** All are correct

.....

**18. Today most citric acid is produced by microorganisms particularly .....**

**a)** *Aspergillus niger* **b)** *Saccharomyces cerevisiae* **c)** *Penicllium* sp. **d)** *Rhizopus*

.....

**19. The addaptation phase (lag phase) in the fungal growth curve includes ..... .....**

**a)** adaptation **b)** digestive enzymes excretions **c)** nutrient uptake **d)** all choices are correct

.....

**20..The relationshipes between fungi and other living organisms includes.....**

**a)** parasitic **b)** saprophytic **c)** symbiotic **d)** all choices are correct

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**III. Answer <u>ONLY SIX</u> the following questions (with drawing as possible) (30 marks each):**

1. **Illustrate with drawing sporangium, sporangiole, and monospores.**
2. **Briefly explain the sexual reproduction of Oomycetes.**
3. **Describe the Different Types and Production Processes of Baker Yeasts.**
4. **Illustrate the life cycle of Rhizopus.**
5. **Show the difference between bacterial cell, bacteriophage and Flu(influenza).**
6. **Illustrate only Two External Factors affecting fungal growth.**
7. **Illustrate the Growth Curve of the Bacteria and Unicellular Fungi.**
8. **Give short notes on the details of the bacterial cell components.**
9. **Write on the aspects of inoculation or the aspects of vaccine.**

**Good luck**

**Khalid A. Hussein, Ph.D.**

**Department of Botany and Microbiology**
**Faculty of Science, Assiut University**

**Final Exam. For the 2rd level students – June, 2024.**
**Academic Program: Botany and Microbial Biotechnology**
**Subject: Mycology (207 BT)** **Maximum Allowed Time: 120 Min.**

**Answer the Following Questions (Illustrate your answers whenever possible)**

**Q1. Choose (T) for True sentence or (F) for False sentence):-** **(12 Marks)**

1- Members of Basidiomycota produce sexual spores that are usually borne in groups of eight inside a sac-like structure. ( )
2- Pseudoplasmodium is defined as the aggregation of unicellular, uninucleate naked amoeboid cells which represents the vegetative structure of some slime molds. ( )
3- The asci arising singly and directly from zygote, the sex organs are absent and hence no ascocarps are developed in Zygomyceteous fungi. ( )
4- 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. ( )
5- The cell wall of slime molds (Myxomycota) is made of chitin. ( )
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 female gametes are represented by haploid nuclei within definite structures known as ascogonia in Zygomyceteous fungi. ( )
8- The fungal taxa related to Oomycetes produce zoospores with single posterior whiplash flagella. ( )
9- Imperfect (anamorphic) fungi produce thick-walled sexual spore known as zygospores.( )
10- Anteriorly tinsel uniflagellum is the characteristic features for Oomyceteous fungi. ( )
11- The ostiolate flask-shaped conidiomata are known as perithecium. ( )
12- Apothecium is a globose (spherical), completely closed fruit body with no special opening to the outside and contain scattered asci. ( )

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

| 1 | Cleistothecium | Perithecium |
|---|---|---|
| | | |
| 2 | Primary plasmodium | Secondary plasmodium |
| | | |

| | | |
|---|---|---|
| 3 | Ascomycotina | Basidiomycotina |
| | | |
| 4 | Chytridiomycota | Hyphochytridiomycota |
| | | |
| 5 | Hetero-basidiomycetinae | Eubasidiomycetinae |
| | | |
| 6 | *Plasmodiophora* | Octomyxa |
| | | |

**Q.3: Choose the correct answer (A, B, C, D or E ):-** **(13 Marks)**

**1- Fungi which do not produce sexual spores where the sexual reproduction is lacking are known as**

**A-Myxomycota B- Zygomycotina C- Ascomycotina D- Mastigomycotina E- None of all**

**2- 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 E- None of all.**

**3- Copulation of two motile, unequal size and morphologically similar gametes is referred as**

**A- Anisogamy B- Oogamy C- Fragmentation D- Heterogamy E- None of all**

**4- The fungal cell is uniquely characterized by the presence of**

**A- Lomasomes. B- Smooth endoplasmic reticulum C- Both a&b D- Cell wall E- None of all.**

**5- 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 E- None of all**

**6- Aggregation of large, erect and compact sporophores (compound conidiophores) are referred as**

**A- Pycnidia B- Synnema C- Acervulus D- Ascospores E- None of all**

**7- The endogenous sexual spores which are produced by some higher fungi are known as:-**

**A- Arthrospores B- Zygospores C- Cleistothecium D- Basidiospores E- None of all**

**8- The fungal thallus which is entirely converted into reproductive structures is known as:-**

**A- Heterothallic B- Saprophytic C- Endobiotic D- Eucarpic E- None of all**

**9- Mycorrhiza, a relationship between fungi and roots of higher plants is**

A- Parasitic relationship B- Saprophytic relationship C- Epiphytic relationship

D- Pathogenic relationship E- None of all

10- 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 E- None of all.

11- The copulation between two unequal size motile gametes is termed:-

A- Oogamy B- Somatogamy C- Spermatization D- Anisogamy E- None of all

12- The main sterol found in the plasma membrane of fungi is:-

A- Cholesterol B- Ergosterol C- Fatty acids D- Triglycerides E-None of all

13- Yeasts are unlike bacteria in being

A- Unicellular B- multicellular C- Prokaryotic D- Eukaryotic E- None of all

## Q.4: Give the Scientif term for 10 ONLY of the following:- (10 Marks)

1- The symbiotic relationships between fungi and roots of higher plants.
2- The amoeboid naked mass of multinucleate protoplasm lacking a definite form.
3- The fungal spores concerned with fungal with fungal survival.
4- Asexual, imperfect or conidial state of a fungal species.
5- The entire thallus converts into one or more reproductive bodies. Therefore, the vegetative and reproductive phases do not occur together.
6- The fungal species in which a single mycelium is capable of reproducing sexually.
7- The life cycle in which the main form of the life cycle is diploid.
8- The wide, open, saucer-shaped or cup-shaped asexual fruit body.
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 spores concerned with the fungal dispersal.

### A Table for your answers:

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

**Q.5: Define briefly with labeled illustrations TWO ONLY of the following:- (5 Marks)**

**1- Stroma:**

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**2- Gametangial copulation:**

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**3- Different types of mycelia of Basidiomycotina:**

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**4- Sexual spores in both Ascomycota and Basidiomycota:**

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***Good luck***

***Prof. Abdel-Raouf Khallil***