Assiut University **Faculty of Science** **Botany & Microbiology Dept.**		جامعة أسيوط كلية العلوم قسم النبات والميكروبيولوجى
Mycology (2) exam. (362B)		**Time: 2 hours**
29th June 2021		**3rd level students**

ملحوظة : يتم طمس (تسويد) الاجابة المختارة بإستخدام القلم الجاف فقط:-

Part I: Final Exam — 50 marks

Q1: Choose the correct answer:

1. **Which of the following powdery mildews fungi producing ascoma surrounded by appendages with coiled end**
   a. *Erysiphe* b. *Phyllactenia*
   c. *Uncinula* d. *Microsphaera*
2. **Aflatoxins are a serious problem because:**
   a. They are produced by the most common fungus, *Aspergillus niger*
   b. They are carcinogenic
   c. They cause nephrotoxicosis
   d. None of the above
3. **In Basidiomycota, dikaryon mycelium means that each cell has**
   a. Single haploid nucleus b. Single diploid nucleus
   c. Two haploid nuclei d. Two diploid nuclei
4. **Which of the following fungi produces citric acid**
   a. *A. niger* b. *A. ochraceus*
   c. *A. fumigatus* d. None of the above
5. **Which of the following spore is haploid uninucleate**
   a. Basidiospore b. Teleutospore
   c. Aeciospore d. Uredospore
6. **Which of the following fungi used in manufacture of cheese**
   a. *P. chrysogenum* b. *P. camemberti*
   c. *P. marnefii* d. *P. expansum*
7. **The fungus producing single conidia and several asci ascoma with myceloidal appendages**
   a. *Uncinula* b. *Podosphareae*
   c. *Erysiphae* d. *Leveillula*
8. **A fungus reproduced by arthrospores**
   a. *Cordycepioideus* b. *Geotrichum candidum*
   c. *Erysiphe* d. None of them

9. **A human disease caused by *Candida albicans***
   a. Penicillosis
   b. Endophthalmitis
   c. Aspergillosis
   d. Keratits
10. **Lichens are associations between fungi and …..**
   a. Fungi
   b. Bacteria
   c. Plant roots
   d. Algae
11. **The ergot fungus *Claviceps purpurea* cause …….. of infected cells**
   a. Hyperplasia
   b. Hypertrophy
   b. Necrosis
   d. Both a & b
12. **The middle part of *Aspergillus* conidiophore**
   a. Stipe
   b. Vesicle
   c. Soot cell
   d. Conidia
13. **The teleomorph of *Aspergillus flavus***
   a. *Neosartorya*
   b. *Emericella*
   c. *Petromyces*
   d. None of them
14. **Asexual spores produced by Ascomycetes are ……**
   a. Conidia
   b. Ascospores
   c. Basidiospores
   d. Sporangiospores
15. **Ascomycetes which closely associated with insects and kill insects under appropriate environmental conditions**
   a. Entomopathogenic fungi
   b. Nematophagous fungi
   c. Coprophilous fungi
   d. None of them
16. **All the following are asexual fruiting bodies produced by ascomycetes <u>EXCEPT</u>**
   a. Acervuli
   b. Conidiomata
   c. Sporodochia
   d. Apothecia
17. **Which of the following fungi produces cholestrol-lowering drug?**
   a. *Aspergillus niger*
   b. *Penicillium citrinum*
   c. *P. chrysogenum*
   d. *Microsphaera*
18. ***Penicillium* species with symmetrical penicilli belong to Subgenus**
   a. Penicillium
   b. Biverticillium
   c. Furcatum
   d. Aspergilloides
19. **The plectomycetes asci is characterized by**
   a. Globose or ovoid and scattered
   b. Clavate and arranged
   c. Clavate and intermixed with paraphyses
   d. None of them
20. **Ascocarps may be ……..**
   a. Present or absent in the Ascomycota
   b. Known as a pycnidium
   c. Known as a sporodochium
   d. Known as an acervulus
21. **Fungi belonging to Deuteromycetes are:**
   a. Lacking teleomorph
   b. Lacking anamorph
   c. Lacking dimorph
   d. Producing ascospores
22. **The majority of fungi**
   a. Reproduce by ascospores
   b. Get their nutrients from living organisms
   c. Are filamentous
   d. None of them
23. **Yeasts are characterized by ……**
   a. Riboflavin production
   b. Budding
   c. Symbiotic fermentation
   d. All of them

24. **A type of reproduction in which a new cell develops from an outgrowth (projection) is called.**
    a. Ascospore formation b. Binary fission
    c. Chlamydospore d. Budding
25. ***Pseudoallescheria boydii* belongs to order**
    a. Eurotiale b. Microascales
    c. Hypocreales d. Dipodoascaceae
26. **Mycelia are septate in both**
    a. Basidiomycetes and Oomycetes b. Zygomycetes and Ascomycetes
    c. Oomycetes and Zygomycetes d. Basidiomycetes and Ascomycetes
27. **Flask shaped asexual fruiting bodies**
    a. Perithecia b. Pycnidia
    c. Sporodochia d. Sclerotia
28. **Fungal structure form pseudoparenchyma tissues which organized together into sterile fruiting bodies**
    a. Sclerotia b. Cleistothecia
    c. Acervulus d. Pycnidia
29. **Which fungus ferments sucrose under anaerobic and semiaerobic conditions?**
    a. *Penicillium* b. *Taphrina*
    c. *Aspergillus* d. *Saccharomyces*
30. **Arthropods associated pyrenomycetes fungus**
    a. *Cordycepioideus* b. *Aspergillus*
    c. *Erysiphe* d. *Microsphaera*
31. **Sexual reproduction in *Schizosaccharomyces***
    a. Budding b. 8-ascosporic asci
    c. 4-ascosporic asci d. 8- ascosporic ascomata
32. **Saprophytic fungi grown on woody substrates**
    a. foliicolous fungi b. lignicolous fungi
    c. corticolous fungi d. coprophilous fungi
33. **Rounded ascocarp composed of loosely organized network of hyphae with no natural opening or ostiole, enclosing randomly dispersed asci.**
    a. cleistothecium b. gymnothecium
    c. Perithecium c. apothecium
34. **Cup shaped ascomata is characteristics for**
    a. Discomycetes b. Plectomycetes
    c. Pyrenomycetes d. Saccharomycetes
35. ***Galactomyces geotrichum* belongs to family .....**
    a. Pleosporaceae b. Dipodoascaceae
    c. Microascaceae d. Erysiphaceae
36. **All of the following fungi producing ascomata <u>EXCEPT</u>**
    a. *Candida* b. *Penicillium*
    c. *Aspergillus* d. *Uncinula*
37. **Fungi that can live as both filamentous and yeast stages**
    a. Dimorphic b. Heterotrophic
    c. Holocarpic d. Autotrophic

38. **The fungus characterized by loose hyphal fruiting bodies containing spherical asci, each ascus enclose 8 ascospores**

a. *Talaromyces* b. *Eupenicillium*
c. *Eurotium* d. *Emericella*

39. **The group of fungi possessed thin-walled prototunicate asci which typically dissolve at maturity within a completely enclosed ascocarp, a cleistothecium**

a. Pyrenomycetes b. Discomycetes
c. Plectomycetes d. Saccharomycetes

40. **Common smut of corn is caused by**

a. *Puccinia graminis* b. *Ustilago maydis*
c. *Tilletia caris* d. *Microsphaera*

41. **A biotrophic fungus causing leaf curl disease of peach**

a. *Uncinula* b. *Candida*
c. *Talaromyces* d. *Taphrina*

42. **Sexual stage in *Taphrina***

a. Naked ascus b. Perithecium
c. Cleistothecium d. Apothecium

43. **The causal agent for a group of diseases collectively termed as Candidiasis**

a. *Candida albicans* b. *Emericilla nidulans*
c. *Saccharomyces cerevisiae* d. *Microsphaera*

44. **A fungus which used for production of Japanese sake**

a. *Aspergillus terreus* b. *Penicillium chrysogenum*
c. *Aspergillus oryzae* d. None of them

45. **Which of the following penicillia cause green rot of citrus fruits?**

a. *P. italicum* b. *P. expansum*
c. *P. citrinum* d. *P. digitatum*

46. **The fungus producing conidial chain and several- asci ascoma with myceloidal appendages**

a. *Uncinula* b. *Podosphareae*
c. *Erysiphae* d. none of them

47. **Ascoma having appendages with bulbous bases and acute ends are characteristic for ……..**

a. *Uncinula* b. *Phyllactinia*
c. *Erysiphe* d. *Microsphaera*

48. **The well-known animal pathogen belong to Ophiostomatales**

a. *Candida albicans* b. *Pseudoallescheria boydii*
c. *Sporothrix schenckii* d. Both of them

49. **Which of the following fungi is used in production of lovastatin:**

a. *Emericella nidulans* b. *Aspergillus oryzae*
c. *Penicillium citrinum* d. *Aspergillus terreus*

50. **Which of the following penicillia cause skin infections to AIDS patients?**

a. *Penicillium chrysogenum* b. *P. marneffei*
c. *P. citrinum* d. *P. allii*

Part II: Mid-term & oral exams:- (30 Marks)

Q1: Choose (T) for True sentence or (F) for False sentence:

51. *Aspergillus niger* is used as model organism in biological researches.
52. *Aspergillus fumigatus* is the anamorph of *Aspergillus petromyces.*
53. *Claviceps purpurea* is the causal agent for ergot disease in rye.
54. Spoilage of apple fruits is caused by *Penicillium expansum.*
55. *Erysiphe* characterized with cleistothecium containing numerous asci with mycelial like appendages.
56. Not all *Aspergillus* teleomorphs producing cleistothecia.
57. Ergometrine is therapeutic compounds found in sclerotia of *Claviceps purpurea.*
58. *Eurotium* is the teleomorph of *Talaromyces.*
59. *Hypocrella* grows on scale insects.
60. *Sphaerotheca pannosa* characterized with one ascus ascocarp.
61. *Cordycepioideus* fungus is restricted for the infection of termites.
62. Appendages solid and dichotomously branched tips ascomata with more than one ascus is characteristics of *Microsphaera* ascocarp.
63. The smut fungi are pathogenic organisms with the symptoms of black, dusty masses of teleutospores resembling soot that formed in diseased plants.
64. *Urocystis tritici* spores are formed in groups.
65. *Sphacelotheca sorghi* cause covered smut of sorghum.
66. *Tilletia caris* cause bunt of wheat.

67. *Urocystis cepulae* cause common smut of corn.

68. *Tolyposporium ehrenbergii* cause long smut of sorghum.

69. *Leveillula taurica* containing one ascus ascomata with myceloidal-like appendages.

70. Secondary mycelia of Basidiomycota characterized by binucleate mycelia and the Clamp connections.

71. In Heterobasidiomycetes, basidiocarps rarely formed.

72. Autoecious fungi complete their life cycles on two plants.

73. *Uromyces faba* characterized by one cell teleutospore.

74. Teleutospore of *Puccinia graminis* contains two cells.

75. *Phragmidium subcorticum* characterized by one cell stalked teleutospore.

76. The ascomata of *Podosphaera* is characterized with one ascus ascocarp with coiled appendages.

77. *Melampsora lini* characterized by sessile teleutospores.

78. Basidiocarp originates from tertiary mycelia.

79. Holobasidia are single cell structure.

80. Basidiomycetous fungus *Filobasidiella neoformans* is a serious human pathogen, particularly in AIDS patients.

Good Luck

Prof. Dr. Mohamed Abdel-Sater Dr. Elhagag Ahmed Hassan

Final -Term Exam
2020/2021

Botany and Microbiology Department

Plant biochemistry (352 B)
Third Level (Credit hours)

Time: 2 hours

Q1) Choose the correct answer (Final exam): ***(50 Marks)***

1- The root nodules of legumes contain a pink pigment which has high affinity for oxygen is
a) Nod haemoglobin b) Leghaemoglobin
c) Haemoglobin d) Bacterial haemoglobin

2- The process of conversion of soil NO_3^- to N_2 is called
a) Nitrification b) Denitrification
c) Ammonification d) Nitrogen fixation

3- *Anabaena, a* N_2 fixer is present in the root pockets of
a) *Marselia* b) *Salvinia*
b) *Pistia* d) *Azolla*

4- From root hairs, rhizobia penetrate deep into cortex of host root through,
a) Cortical cell wall b) Infected threads
c) Plasmodesmata d) All of the above

5- Conversion of nitrite to ammonia is mediated by transfer of,
a) Six electrons b) Four electrons c) Two electrons d) None of the above

6- Which of the following is a component of nitrogenase?
a) Fe-protein b) Fe Mo-protein
c) Both (a) and (b) d) None of the above

7- Which of the following trace elements is associated with prosthetic group of nitrite reductase?
a) Mo b) Mn c) Fe d) Ca

8- In which of the following, nitrogen is present in organic form?
a) Atmospheric nitrogen b) Nitrates and nitrites
c) Ammonia d) None of the above

9- Splitting of dinitrogen molecule into free nitrogen atom in biological N_2 fixation is carried out by
a) hydrogenase b) nitrogenase
c) dinitrogenase d) nitrate reductase

10- Plants absorbs N_2 in the form of
a) Nitrites (NO_2^-) b) Nitrates (NO_3^-)
c) Ammonium (NH_4^+) d) All of the above

11- Plants cannot absorb molecular N_2 in the atmosphere because
a) N_2 has double bonds making it highly stable b) Abundance in the atmosphere inhibits absorption
c) N_2 has triple bonds making it highly stable d) None of these

12- The conversion of amino acids to ammonium by soil decomposers is called
a) Ammonification b) Mineralization
c) Deamination d) Both a and b

13- Leghaemoglobin creates
a) Anaerobic condition for optimum activity of nitrogenase
b) Aerobic condition for optimum activity of nitrogenase
c) Required oxygen concentration for optimum activity of nitrogenase
d) Suitable environment for nodule formation

14- What is the most common way that nitrogen fixation occurs?

a) Lightning
b) Nitrogen fixing bacteria
c) Fossil fuel combustion
d) Forest fires

15- Which of the following is a component of acid rain?

a) Ammonium
b) Denitrifying bacteria
c) Nitrogen oxides
d) Organic nitrogen

16- Which process releases dinitrogen gas (N_2) back into the atmosphere?

a) Denitrification
b) Nitrogen fixation
c) Decay
d) Nitrification

17- Once bacteria have fixed nitrogen, it can be taken up by plants and animals, where it is used in the production of

a) Nitrogen oxides
b) Carbohydrates
c) Proteins
d) Energy

18- Organic nitrogen is converted back to inorganic nitrogen like ammonium through the process of

a) Nitrogen fixation
b) Nitrification
c) Decay
d) None of the choices

19- Which process in the nitrogen cycle turns dead plants and animals into ammonium?

a) Fixation
b) Nitrification
c) Assimilation
d) Ammonification

20- Which process in the nitrogen cycle takes extra nitrogen from the soil and puts it back into the air?

a) Fixation
b) Nitrification
c) Assimilation
d) Ammonification
e) Denitrification

21- In what way is nitrogen important to life on Earth?

a) It is used in making DNA
b) It is used to make chlorophyll in plants
b) It is used in amino acids and proteins
d) All of the above

22- In which form is nitrogen taken up by non-legume plants?

a) Nitrogen gas from the air
b) Nitrates from the soil
c) Protein from the soil

23- Dinitrogenase reductase is a

a) Monomer
b) Dimer
c)Trimer
d) Tetramer

24- The reaction of glutamate and NH_4^+ to yield glutamine is catalyzed by

a) Uridylyltransferase
b) Adenylyltransferase
c) Glutamate synthase
d) Glutamine synthase

25- Around what percentage of the Earth's atmosphere is nitrogen?

a) 2%
b) 14%
c) 30%
d) 78%

26-Photosynthesis is

a) Catabolic process
b) Anabolic process
c) Amphibolic process
d) None of the above

27- The number of O_2 molecules released per photon of light in photosynthesis is called as,

a) Quantum requirement
b) Quantum yield
c) Photosynthetic yield
d) Respiratory yield

28- Reaction centre of pigment system II is,

a) P-680
b) P-690
c) P-700
d) P-663

29-The reduced form of nicotinamide adenine dinucleotide is:

a) $NADP^+$
b) NAD^+
c) $NADH_2$
d) $NADPH_2$

30- Starch inter Krebs cycle in the form of

a) Citric acid b) Acetyl CoA c) Pyruvic acid d) Succinyl CoA

31- The head piece of ATP- synthease (CF_1) in thylakoids consists of how many different polypeptides?

a)Two b) Three c) Four d) Five

32- Which of the following is common in both aerobic and anaerobic respiration?

a) Alcoholic fermentation b) Glycolysis c) Kerbs cycle d) Light reaction

33- In mitochondria succinate dehydrogenase is located in

a) Matrix b) Outer membrane c) Inner membrane d) Stroma

34-Which of the following is released during conversion of succinate to fumurate in TCA cycle?

a) CO_2 b) $FADH_2$ c) H_2O d) ATP

35- Acceptor of acetyl coenzyme A in Krebs cycle is

a) Citric acid b) Fumaric acid c) Oxalo acetic acid d) Succinic acid

36- Photosystems are functional pigment groups located on the

a) Proteins of the plasma membrane b) Thylakoids membranes

c) In the stroma of the chloroplasts d) The fluids of vacuoles

37- Conversion of Xylulose-5p to Ribulose-5P catylyze by

a) Epimerase b) Isomerase c) Amylase d) Oxidase

38- Stacks of thylakoids is called

a) Stroma b) Photosystem c) Matrix d) Granum

39- The assimilatory power formed in light reaction are

a) ATP&$NADPH_2$ b) ATP c) $NADH_2$ d) $FADH_2$

40- How many different polypeptides in the tail piece of ATP- synthease (CF_0) in thylakoids?

a) Seven b) Three c) Four d) Six

41- Oxygen released in photosynthesis during

a) Light reaction b) Krebs cycle c) Dark reaction d) Electron transport

42- Which of the following does not occur in cyclic electron transport &photophosphorylation?

a) O_2 evolution b) Photolysis of water

c) Formation of reduced NADPH d) All of the above

44- In chloroplasts, photodynamic damage is prevented by

a) Chlorophyll-b b) Carotenoids c) Pheophytin d) Phycobillins

45- The oxygen released during photosynthesis comes from the

a) Splitting of water molecules b) Formation of ATP

c) Formation of glucose d) Splitting of carbon dioxide molecules

46- Cellular respiration starts by glycolysis in the

a) Cytoplasm b) Chloroplast c) Stroma d) Matrix

47-The first stable compound of Calvin cycle is

a) Phosphoglyceric acid c) Malic acid

b) Glucose d) Phosphoglyceraldehyde

48- Splitting of fructose 1,6 diphosphate to 2 molecules of phosphoglceraldhyde is catalyzed by

a) Epimerase b) Diastase c)Aladolase d) Invertase

49-Which of the following is NOT a produce of the light dependent reaction

a) Oxygen b) sugar c) NADPH d) ATP

50- How many chlorophylls molecules are required to fix one molecule of CO_2?

a) 3000 b) 2000 c) 2500 d) 4000

Q2) Choose the correct answer (Mid Term+ Oral + Activity): ***(30 Marks)***

51-Nitrate reductase takes place chiefly in,

a) Roots b) Green leaves
c) Both (a) and (b) d) None of the above

52-The enzyme nitrate reductase is inducible type of enzyme which is found in cells in,

a) Cytosol b) Chloroplasts c) Leucoplasts d) All of above

53- Conversion of nitrite to ammonia is mediated by transfer of,

a) Six electrons b) Four electrons
c) Two electrons d) None of the above

54-Nitrite reductase is a single polypeptide that contains

a) One prosthetic group b)Two prosthetic groups
c) Three prosthetic groups d) None of the above

55-Nitrogen fixation is the process of conversion atmospheric nitrogen into,

a) Nitrates b) Nitrites c) Ammonia d) Inorganic nitrogenous compounds

56-The rhizobia enter into roots of leguminous host plant through,

a) Epidermal cells b) Root hairs c) Meristematic region d)Zone elongation

57- Attachment of rhizobia to root hairs of host plant tack place due to exchange of signals between the two partners that include,

a) Production of some Nod factors by rhizobia
b) Secretion of some chemicals such as flavonoids and betaines by roots
c) Activation of specific sugar binding protein (lectins) on root hairs by Nod factors
d) All of above

58-Conversion of nitrate into ammonia is a,

a) Reductive process b) Oxidative process
c) Amination process d) None of the above

59-Nitrogen fixation is the conversion of

a) N_2 to N b) N_2 to NH_3 c) N_2 to NO_3^- d) N_2 to urea

60-Nitrosomonas and nitrobacter are

a) Ammonifing bacteria b) Nitrogen fixing bacteria
c) Denitrifying bacteria d) Nitrifing

61- How many molecules of ATP are required to fix one molecule of nitrogen?

a) 12 b) 20 c) 6 d) 16

62- Nitrification happens in the _____

a) Air b) Soil c) Ground water d) Plants

63- What type of reaction is used to dominate most amino acids?

a) ATP dependent ligation b) Transamination
c) Oxidation d) Condensation

64- Important enzymes involved in nitrogen fixation are

a) Nitrogenase and hydrogenase b) Nitrogenase and hexokinase
c) Nitrogenase and peptidase d) Nitrogenase and hydrolyase

65- Which of the following is a living organism that is part of the biological N fixation process?

a) Nitrosomona b) Rhizobium c) Nitrogenase d) Leghemaglobin

66- Accessory pigments absorbs light energy and transferred by resonance to

a) Chlorophyll-a b) Chlorophyll-b c) Chlorophyll-c d) Pheophytin

67- Photolysis of water and O_2 evolution (Oxidation of water) are catalyzed by the presence of

a) Mn^{++} b) Zn c) S d) none of the above

68- The final product in respiration is:

a) Glucose b)Water c) Oxygen d) FADH2

70- Net ATP produced in glycolysis is

a) 2ATP b) 12ATP c) 6ATP d) One ATP

71- Mitochondria contain

a) Cristae b) Grana structure c) Stroma d) Photosystem

72-Which an enzyme catalyzed the carboxylation of CO_2 to phosphoglyceric acid

a) Aldolyase b) Rubisco c) amylase d) oxidase

73- Electrons acceptor of photosystem I is

a) Ferrodoxin b) Plastocyanin c) Plastoqunine d) Cytochrome b6

74- Molecule of chlorophyll is composed of

a) Hydrophilic head b) Tail c) Both a&b d) Iron

75- Photons of light when striking chlorophylls molecules can be

a) Transmitted b) absorbed c) reflected d) none of the above

76- Green algae and higher plants contain

a) Chlorophyll-a &Chlorophyll-b b) Chlorophyll-a & Chlorophyll-c

c) Chlorophyll-a & Chlorophyll-d d) All of above

77- Light harvesting complexes (LHCI and LHCII) in two photosystems consist of ,

a) Reaction centre I & II b) antenna pigments associated with proteins

c) Cytochrome b6f d) none of the above

78- Photosystem II is located predominantly in the

a) Unstaked regions of thylakoid membrane b) Stacked regions of the thylakoid membrane

b) Stroma d) None of the above

79- The enzyme responsible for photophosphorelation in thylakoids membranes is

a) Peroxidase b) Catalase c) ATPase d) Diastase

80- Dark reactions of photosynthesis occur in

a) Granal thylakoid membranes b) Stromal lamella membranes

c) Stroma outside photosynthetic lamellae d) Periplastidial space

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Good luck

Dr. Abeer Radi *Dr. Fatma Farghaly*

Faculty of Science
Assiut university

Second Semester exam. (2020-2021), Ecology of algae (374 B)
Botany and Microbiology Department
Time allowed: 2hours

Question no (1) Final Exam (50 marks)

Q1:Shade(T) for true statements or (F)for False statements (1Mark each) for the following statements.

1	phytoplankton are primary producers of organic matter in aquatic habitats.
2	Epiphytic algae are found upon or inside the surface of the earth
3	Alginates are found in the cell wall of the diatoms
4	Net primary production of algae can be measured by monitor the amount of organic matter produced per unit time
5	Iodine extracted from the Phaeophyta
6	Cyanophyta improve the aeration of swamp soils and fix atmospheric nitrogen.
7	Trentepohliaceae, penetrates into the stomata of tropical plants as a semi parasitic algae
8	Algae live in mutulastic association with embryos inside salamander egg capsules.
9	Lithophytic algae are those algae grown on other plants and bigger algal members
10	The growth of algae, especially blue green algae, spoil plaster, brick work and ships
11	Estuaries among the most productive natural habitats in the world.
12	Epizoic algae grow in semi-permanent to permanent snow or ice in polar regions of the world
13	Lichens can be used in ozone depletion, making dyes,perfumes
14	Light is principal factor limiting algal productivity
15	Both pH and dissolved oxygen increase when vigorous photosynthesis occurs in productive waters
16	Different microalgal classes have significantly different light requirements for growth and photosynthesis

	Magnisum is very important for algal productivity and growth
18	Some symbiotic algal relationships are obligate For example, lichens
19	Alga enters into a symbiosis relationship is character by its high growth rate
20	The fresh and marine algae which found in attached condition are called Benthophytes
21	Algae is a collective term of all those chlorophylls bearing organism which contain transport system
22	Silicon is absolute requirement element for diatoms and for some sp. of chrysophyceae
23	Diatoms have been used in forensic medicine,
24	Sea weeds (Laminaria, Fucus, Ascophyllum are used as food for domestic animals
25	Algae is a collective term of all those chlorophylls bearing organism which are thalloid
26	Cell wall of chlorophyta made of pure or mixed carbohydrates
27	Epactiphytes are those algae grow on rock
28	Snow algae grow along the shores of lakes and ponds
29	pH concentration has no effect on algal assemblage and growth
30	Herbivores by aquatic invertebrates affect algal populations and their occurrence
31	Bicarbonate is the common carbon source for algae which are photolithotrophic
32	Algae can use various nitrogen sources such as atmospheric nitrogen as an important source of their productivity
33	Algae can be used in sewage water purification and treatments
34	The algae occur in saline waters are known as 'halophytes
35	Grazing affecting The organic carbon produced from algae
36	Cryptophytes fix the atmospheric nitrogen in the soil to enrich the fertility of the fields
37	Some of Aerial epiphytic algae are semi-parasitic
38	Iodine uptake and accumulation in marine algae are temperature dependent

57	Virus can live in symbiosis relationship with algae in their habitats
58	Dinoflagellates and blue-green algae generally photosynthesize and grow better at low photon flux densities (PFD).
59	The sharp drop in phytoplankton in summer may be caused by high grazing
60	We can used algae in production of fuel and cosmotic
61	The penetration of light influences the distribution of oxygen and nitrogen in the aquatic system
62	Direct sunlight is too strong for most algae
63	Sulphur is absolute requirement element for the growth of diatoms
64	The availability of iron affect algal distribution and occurrence
65	The depth of the photic zone can be affected greatly by seasonal turbidity

Good luck

Prof. Awatief F. Hifney

39	The high growth of plankton may lead to death of fish either directly or indirectly
40	Both of phycobilliprotein and other cellular protein degraded in P-deprived cell of many algae
41	Iron is present in ionic form in water bodies and its quantity for algae is limited in alkaline soils.
42	*Cephaleurous* infections on tea and coffee plants called red rust disease
43	Epizoic algae are growing, dispersed in water and unattached to solid objects
44	The algae of the estuarine are three major types aerialepiphtic algae, sea weeds and benthic
45	Fungal piece in the symbiotic relationship with algae called "photobiont"
46	Magnesium is very important for photosynthesis and for increasing the algae biomass
47	Symbiotic algae live in direct association inside salamander egg capsules
48	Many algae produce growth substance and antibiotic which affect the soil flora
49	Phosphorus deficiency affect algal growth and productivity
50	Phycobiont live inside Paramecium cytoplasm and provide it with movement and protection .

Question no (2): (Mid term ,activity and oral exam (30marks))

Shade(T) for true statements or (F) for False statements (2Mark each) for the following sentences.

51	Endophytic algae are those algae live inside the animals
52	Aerial epiphytic algae found on Rocks
53	Productivity means the amounts of algal biomass produce in special time per unit area
54	Epilithic. Are those algae living on surface of rocks
55	Soil algae are algae found on living aquatic animals such as shells, fishes
56	The green colour of green sea sludge comes from algal chloroplasts

Assiut University - Faculty of Science - Botany and Microbiology Dept.

Second Semester (2020 – 2021)

Course Title: Microbial Metabolism (Code: B-392)

Date: 7/7/2021 Time: 2 hours Total marks: 80 marks

Part 1: Final exam (50 marks)

Q1) Shade the correct answer; A, B, C or D:(1 marks each)

1- ..... knows as antifreeze compound in psychrophilic fungi

a) Sugar alcohol b) Ethanol c) D-xylose d) Citric acid

2- Cellular respiration means .....

a) Catabolism of glucose b) Catabolism of lipid

c) Catabolism of amino acid d) Catabolism of nucleic acid

3- During fermentation the total amount of ATP produced from one molecule of glucose is.....

a) 2 ATP b) 4 ATP c) 8 ATP d) 10 ATP

4- Entner-Doudoroff pathway common in .....

a) Gram (+) bacteria b) yeast c) fungi d) Gram (-) bacteria

5- In fungi, the amino group is removed and then excreted in the form of.....

a) NH_3 b) NO_2 c) NH_2-CO-NH_2 d) NO_3

6- Amino acids must be ..... before entering any of the pathways of glucose catabolism

a) Hydrolysis b) Activated c) Deaminated d) Break down

7- Pentose Phosphate Pathway (PPP) takes place in .....

a) Plasma membrane b) Cytosol c) Mitochondria d) Vacuole

8- Entner-Doudoroff (ED) pathway Occurs in.....

a) Prokaryotes b) Eukaryotes c) Yeast d) Plants

9- Carnitine carries transport .....into mitochondrial matrix

a) Amino acids b) protein c) Nucleic acids d) Fatty acids

10- Phosphorylation of glucose carried out by using .....

a) NADH b) ATP c) ADP d) FAD

11- .....knows as hexose monophosphate shunt.

a) Glycolysis b) Pentose Phosphate Pathway c) citric acid cycle
d) Entner-Doudoroff pathway

12- Activation of Fatty Acids performed by ..... synthetase

a) Acetyl CoA b) ATP c) Acyl CoA d) Enoyl CoA

13- Ribose 5-phosphate produces during.....

a) Pentose Phosphate Pathway b) Fermentation
c) Entner-Doudoroff pathway d) β-oxidation

14- During anaerobic respiration final electron acceptor is .....

a) O_2 b) H_2 c) Organic molecules d) NO_3^-

15- Pyruvate and glyceraldehyde-3-phosphate are final product of .....

a) Pentose Phosphate Pathway b) Fermentation
c) Entner-Doudoroff pathway d) β-oxidation

16- The final product of Oxidative Phosphorylation is .....

a) NADH b) ATP c) ADP d) $FADH_2$

17- Ubiquinone is oil-soluble, vitamin-like substance presents in .....

a) Gram (+) bacteria b) Gram (-) bacteria c) Yeast
d) Archaebacteria

18- During fermentation ..... are used to produce alcohol or lactic acid

a) 2ATP b) 2FADH c) 2NADH d) 2ADP

19- Glycine carbon skeleton breaks down to produce .....

a) Ketones bodies b) Pyruvate c) Acetyl CoA d) Protein

20- The electron transport chain in the mitochondrion is the site of.....

a) Glycolysis b) Fermentation c) Respiration
d) Oxidative Phosphorylation

21- Non-carbohydrates which function as sole carbon source, they must be convert to glucose by a process called.....

a) Glycogenesis b) Glucose synthesis c) Gluconeogensis

d) Lipid synthesis

22- The final product of Embden–Meyerhof–Parnas (EMP) pathway……..

a) 2 NADH b) 2 acetic acid c) 2 Pyruvic acid

d) 2 citric acid

23- The final product from β-Oxidation of fatty acid is……

a) Acetic acid b) Acyl Co c) Enoyl CoA d) Acetyl CoA

24- During triacylglycerol catabolism glycerol is oxidized by ……and the TCA cycle

a) β-Oxidation b) electron transport chain c) Glycolysis

d) Fermentation

25- Acyl CoA synthetase reaction occurs on……

a) Plasma membrane b) Cytosol c) Mitochondrial membrane

d) Cytoplasm

26) Gluconeogenesis converts pyruvate to ……..

A) glucose-6-phosphate B) glycerate 3-phosphate

C)glucogenic amino acids D) glycerol

27) Plants and bacteria can convert fatty acids into ……

A) glyoxylate B) glucose C) citric acid D) fumarate

28) Calvin Cycle is used……

A) cyanobacteria B) purple C) green bacteria D) All of them

29) …….. have been shown to use Reductive TCA cycle

A) Green photosynthetic bacteria B) some thermophillic bacteria

C) reducing sulfate bacteria D) all of them

30) Microbial ammonium assimilation is catalyzed by …… at low concentration of NH_3?

A) glutamate dehydrogenase and glutamine synthetase B) protease

C) glutamine synthetase and glutamate synthase D) ATP citrate lyase

31) In photosynthesis process, carbon dioxide is reduced in……

A) Cyclic photophosphorylation B) Noncyclic photophosphorylation

C) Calvin cycle D) Light reactions

32) Incorporation of atmospheric N_2 to NH_3 occurs via the process of

A) assimilatory nitrate reduction. B) transamination

C) nitrogen fixation. D) deamination.

33) A ..... bond is formed when an amino group of one amino acid joins the acid group of another.

A) covalent B) peptide C) glycosidic D) hydrogen

34) CO_2 is combined with ribulose bisphosphate that immediately splits to form ..... in the presence of ribulose bisphosphate carboxylase

A) acetyl-CoA B) glyoxylate

C) two 3-phosphoglycerate molecules D) Carbamyl Phosphate

35) Amino acids may be synthesized from.....

A) Entner-Douderoff pathway intermediates B) Kreb cycle intermediates

C) Pentose phosphate pathway intermediates D) All of them

36) Anabolism removes water by a process called .....

A) Hydrolysis B) Dehydration synthesis

C) Phosphorylation D) Cellular respiration

37) How many amino acids are there?

A) 20 amino acids B) 15 amino acids C) 12 amino acids D) 30 amino acids

38) Which part of ATP contains the most energy?

A) ADP B) ribose C) adenine base D) phosphate

39) The end products of noncyclic photophosphorylation are

A) O_2, ATP, and NADPH. B) carbon dioxide, and H_2.

C) water, ADP, and NADP. D) ADP, and ribulose.

40) Whole point of photosynthesis is to produce (as an end product)

A) ATP B) Ribulose diphosphate C) Oxygen D) Glucose

41) Most reactions that produce energy in a cell utilize..... as the main reaction type

A) catalysis B) oxidation C) reduction D) hydrolysis

42) All of the following produce oxygen as a product of photosynthesis except

A) cyanobacteria. B) Plants. C) purple sulfur bacteria. D) algae.

43) During the reduction phase of the Calvin cycle, phosphoglycerate is reduced to .....utilizing .....as the reduction source.

A) phosphoglyceraldehyde; NADH B) ribulose 1,5 - bisphosphate; NADH

C) phosphoglyceraldehyde; NADPH D) ribulose 1,5 - bisphosphate; NADPH

44) What kind of chemical reactions result in the synthesis of a protein from amino acids?

A) Catabolic reactions B) Oxidation reactions

C) Anabolic reactions D) Metabolic reactions

45) Photosynthesis in purple bacteria occurs in.....

A) choroplast B) thylakoid C) chlorosomes D) intracytoplasmic memberane

46 Reductive Acetyl CoA pathway Found in .....

A) anaerobic bacteria B) cyanobacteria C) archaea D) anaerobic bacteria and archaea

47) Dicarboxylate/4-hydroxybutyrate forms an extra molecule of acetyl-CoA, with.....

A) pyruvate synthase B) 4-hydroxybutyryl-CoA dehydratase C) PEP carboxylase D) pyruvate synthase and PEP carboxylase

48) urea, nucleotides or amines not used in protein synthesis and can be acted upon by ..... to release the ammonia

A) deaminases B) decarboxylases C) aminotransferases D) all of them

49)All nonessential amino acids (except tyr) are derived from.....

A) Pyruvate B) Oxaloacetate C) 3-phosphoglycerate D) All of them

50) A large amount of ATP, protons and electrons are required to reduce just one molecule of nitrogen gas in the presence of ..... enzyme

A) Nitrogenase B) nitrate reductase C) nitrite reductase D) deaminases

Part 2: Mid-term, Oral, Activity "30 marks"

Q2): Shade (T) for True statements or (F) for False statements: (2 marks each)

51. Succinyl-CoA is reduced to 4-hydroxybutyrate in Dicarboxylate/4-hydroxybutyrate cycle ( )
52. Glutamine is considered as nitrogen donor for amino sugars biosynthesis. ( )
53. The reaction center of heliobacteria (P840) contains Bchl g ( )
54. Proteins available in the environment are acted upon by proteases releasing peptides that are further broken down to amino acids. ( )
55. Light harvesting pigments in oxygenic photosynthesis is chlorophyll ( )
56. Ammonium assimilation is a process where bacteria utilize nitrate as a nitrogen source and synthesize it into organic nitrogen. ( )

57. Nitrate assimilation is known the process of incorporating ammonia nitrogen incorporation into glutamate and glutamine. ( )

58. The synthesis of carbamyl phosphate catalyzed by the enzyme nitrate reductase. ( )

59. Each acetyl group that enters Kerbs Cycle, three molecules of NADH and one molecule of FADH2 are produced ( )

60. Proteins and peptides, can be utilized by fungi once extra cellular lipases have degraded them into amino acids ( )

61. Fermentation is a series of chemical reactions used by all aerobic organisms to generate energy through the oxidation of acetate into carbon dioxide and ATP. ( )

62. Exergonic reaction means it consumes more energy than produce ( )

63. Protein catabolism is the breakdown of proteins into amino acids and simple derivative compounds, for transport into the cell through the cytoplasm. ( )

64. Fungi utilize nitrate, ammonia and some amino acids by direct uptake across the hypha membrane. ( )

65. Lipid catabolism builds stored material when the nutrient present in high concentrations ( )

The end.....with best wishes .....

Dr. Sanaa Mohamed Fahmy **Dr. Maysa Mohamed Ahmed**

Assiut University Academic Program: Microbiology + Chemistry & Microbiology
Faculty of Science Final Term Exam Studying Year : 2020/ 2021
Department: Botany & Microbiology Course Code B 369
Course Title: Industrial Microbiology Forth & third levels, Second semester
Total Degree: 50 + 30 marks Jun 2021 Allowable Time: Two hours

Part One: Final exam. (50 marks)

Q I. Choose the correct answer from the following answers: (30 marks, one for each)

1- Preparation of mash in any fermentation process is a step of:
a) Up-stream process. b) Med-stream process.
c) Down-stream process. d) Separation process.

2- One of important characters in industrial microbe is:
a) Ease in handling. b) Ability to grow rapidly.
c) Corrosion resistant. d) Ease in sterilization.

3- The suitable raw material for a fermentation process has:
a) High concentration of the target compound. b) Ease in cleaning.
c) None ability to mutation. d) Suitable volume.

4- Formulation and viscosity characteristics is a factor for selection of:
a) Fermentor b) Raw material
c) Industrial microbe d) Fermentation mode.

5- Control in contamination is an important character of:
a) Raw material b) Prepared mash
c) Industrial microbe d) Fermentor.

6- Yeast dried at 90°C can be used as:
a) Fresh baker yeast b) Active dry baker yeast
c) Instant active dry baker yeast d) Fodder yeast.

7- Active dry Baker yeast is:
a) Biomass product b) primary metabolic product
c) Secondary metabolic product d) Enzymatic product.

8- The suitable inoculum yeast volume in baker yeast production is:
a) 1-2 % b) 4-7 %
c) 5-10 % d) 10-20 %

9- Sugar level during baker yeast production must be ranged from:
a) 1-5 % b) 10-15 %
c) 20-25 % d) 30-35 %

10- Baker yeast can be added to animal feed for:
a) Remove microbial contamination b) Remove mycotoxins
c) Decrease carbohydrates d) Increase their flavor.

11- The moisture content of fresh baker yeast produced by any company is:
a) 4 – 6 %
b) 10 – 15 %
c) 20 – 25 %
d) 60 – 65 %.

12- The better preservation of the dry yeast activity is achieved by replacement of air with:
a) Nitrogen
b) Hydrogen
c) Oxygen
d) Sulfur, before using vacuum packing.

13- The suitable sugar concentration at the beginning of ethanol production cycle is:
a) 1 – 5 %
b) 7 – 10 %
c) 15 – 17 %
d) 18 – 22%.

14- Suitable temperature for ethanol fermentation depending on:
a) Sugar concentration
b) Yeast strain
c) Ethanol concentration
d) Fermentation mode.

15- Suitable pH in prepared mash for ethanol production is:
a) 2 - 3
b) 4 – 5
c) 8 – 9
d) 9 – 10.

16- Theoretically ethanol yield from fermentable sugar by fermentation nearly equal to:
a) 25 %
b) 50 %
c) 75 %
d) 100 %.

17- Acetic acid formed during ethanol fermentation in the presence of:
a) $NaNO_3$
b) CO_2
c) Oxygen
d) $MgSO_4$.

18- Acidity at the beginning of vinegar production cycle is:
a) 0.5 – 1.5
b) 2.5 – 3.5
c) 5.5 – 6.5
d) 8.5 – 9.5

19 - Acidification of one gram of ethanol by acetic acid bacteria yield:
a) 1.26
b) 2.26
c) 3.26
d) 4.26, gram of acetic acid.

20- Speed of acidification during vinegar production cycle nearly equal to:
a) 0.01 – 0.015 %/ hour
b) 0.10 – 0.15 % /hour
c) 0.10 – 0.15 %/ 2 hours
d) 1.0 – 1.5 % / hour

21- Hydrogenation of progesterone by *Streptomyces lavandulae* formed:
a) 11α-hydroxy-4 pragene-3- one
b) 17α-hydroxy-4 pragene-3- one
c) 20-hydroxy-4 pragene-3- one
d) 21-hydroxy-4 pragene-3- one

22- Dehydrogenation of testosterone by *Trichurus* species formed:
a) Δ^1 dehydrotestosterone
b) Δ^4 dehydrotestosterone
c) Δ^6 dehydrotestosterone
d) Δ^{11} dehydrotestosterone

23) Cortisone can be transferred to prednisone by microbial:
a) Hydrogenation
b) Dehydrogenation
c) Hydroxylation
d) Epoxidation.

24) Epoxidation of a steroid hormone lead to increase the:
a) Activity
b) Production level
c) Productivity
d) Solubility

25) Simple side chain degradation of progesterone by a fungal strain formed:
a) Cortisone
b) Cortisol
c) Testosterone
d) Epicortisone

26) The suitable carbon source for penicillin production is:
a) Glucose b) Molasses
c) Lactose d) Fructose.

27) Separation of penicillin from fermented mash can be achieved by ethyl acetate at pH:
a) 2 – 3 b) 6 – 7
c) 8 – 9 d) 10 - 11

28) Penicillin is eluted from the fungal extract through purification column by:
a) Ethyl acetate b) Nitric acid
c) Acetone d) Cholroform

29) The mode of action of cephalosporin is the inhibition of:
a) Bacterial cell wall b) Bacterial cell membrane
c) Bacterial protein synthesis d) Bacterial DNA

30) The mode of action of streptomycen is the inhibition of protein synthesis through binds:
a) 20 ribosomal subunits b) 30 ribosomal subunits
c) 50 ribosomal subunits d) 70 ribosomal subunits.

Q II. Answer by True (T) or False (F) on the following statements

(20 marks, one for each)

31. Follow up of fermentation is one step of med-stream processes in industrial fermentation.
a) T b) F

32. One of important characters in industrial microbe is the economic volume.
a) T b) F

33. Selection of raw materials for any fermentation process depend on sterilization requirements.
a) T b) F

34. Rapid growth rate, palatability, and genetically stable are the important characters of a yeast strain that can be used for baker yeast production.
a) T b) F

35. Glucose at 18-20 % is the only nutrient for the production of baker yeast.
a) T b) F

36. Alkaline medium is a suitable one for baker yeast production.
a) T b) F

37. The ideal drying method of fresh baker yeast is using the Plate and Frame filter.
a) T b) F

38. Separation of ethanol from fermented mash achieved by distillation.
a) T b) F

39. Treatment of sugarcane juice for ethanol production achieved by only dilution into suitable concentration.
a) T b) F

40. In ethanol fermentation, aeration is very important during fermentation.
a) T b) F

41. Vinegar production is highly aerobic and exothermic fermentation.
a) T b) F

42. Vinegar must be storage in bottle of plastic material, completely filled and tightly with cork.
a) T b) F

43. Vinegar is used for decrease the soil acidity in hard water areas.
a) T b) F

44. Microbial transformation technology is the best method for the production and improvement of steroid hormones.
a) T b) F

45. Hydrogenation of a steroid hormone increases their activity.
a) T b) F

46. Cortisol is 11α, 17 α, 21 trihydroxyprogestrone.
a) T b) F

47. The mode of action of penicillin is the inhibition of bacterial cell protein synthesis.
a) T b) F

48. Cephalosporin has a 4-member cyclic amide.
a) T b) F

49. Tetracycline is consist of amino-sugars linked glycosidically.
a) T b) F

50. Production of each antibiotic from the B-lactam group achieves by fermentation under aerobic conditions.
a) T b) F

Part Two: Med term, Semester work & Instead of Oral exam.

(30 marks)

Q III. Choose the correct answer from the following answers:

(20 marks, one for each)

51) Industrial biotechnology is known as
a) White biotechnology b) Red biotechnology
c) Green biotechnology d) Gray biotechnology

52) Isolation of the target metabolite from the fermented mash is a step of:
b) Up-stream process b) Med-stream process
c) Down-stream process d) Separation process.

53) One of the important characters in the industrial fermentor is:
a) Ease in handling b) Ability to grow rapidly
c) Corrosion resistant. d) Suitable for microbe.

54) The ideal fermentation strategy for baker yeast production is:
a) Batch fermentation b) Repeated feed batch fermentation
c) Surface culture fermentation d) Continuous fermentation.

55) Moisture content of active dry baker yeast is:

a) 1-2 %
b) 4-6 %
c) 10-15 %
d) 20-25 %.

56) Production of backer yeast is:

a) Partially aerobic process
b) Highly aerobic process
c) Facultative aerobic process
d) Anaerobic process

57) Transfer and storage of compressed baker yeast is achieved at:

a) 0 - 5°C.
b) 20 - 25°C
c) 30 - 35°C
d) 40 - 45°C

58) Ethanol % of the theoretical value in batch fermentation technique nearly equal to:

a) 50 – 60 %
b) 65 – 70 %
c) 85 – 90 %
d) 100 %.

59) Aeration is very important in ethanol bio-production at:

a) Preparation of mash
b) Propagation process
c) Production process
c) Distillation process.

60) Glycerol production during ethanol fermentation occurred at pH:

a) 4 – 5 %
b) 6 - 7 %
c) 8 – 9 %
d) 10 – 11 %.

61) Clarification of vinegar achieved by using bentonite at:

a) 0.01 %
b) 0.1 %
c) 1.0 %
d) 1.1 %.

62) Vinegar is natural acetic acid at:

a) 9 – 10 %
b) 7 - 8 %
c) 6 -7 %
d) 4 – 5 %.

63) Hydroxylation of progesterone to cortisol classified as:

a) Mono-hydroxylation
b) Di-hydroxylation
c) Tri-hydroxylation
d) Hydrogenation.

64) Progesterone can be transferred to testosterone by microbial:

b) Hydrogenation
b) Dehydrogenation
c) Hydroxylation
d) Side chain degradation.

65) Epoxidation of a steroid hormone lead to formation of the:

b) 1α, 2α epoxido- compound
b) 4α, 5α epoxido- compound
c) 14α, 15α epoxido- compound
d) 16α, 17α epoxido- compound

66) Production of penicillin by *Penicillium chrysogenum* achieved at:

b) 10°C
b) 25°C
c) 45°C
d) 55°C.

67) For production of penicillin G, the precursor must be added to the medium named:

a) Pentanyl-alcohol
b) Heptyl-alcohol
c) p-Hyroxy acetic acid
d) Phenyl-acetic acid.

68) Most of polypeptide antibiotics produced by:

a) Alge
b) Fungi
c) Yeasts
d) Bacteria.

69) The mode of action of tetracycline is the inhibition of:
a) Bacterial cell wall
b) Bacterial cell membrane
c) Bacterial protein synthesis
d) Bacterial DNA

70) The mode of action of lincomycins is the inhibition of protein synthesis through binds:
a) 20 ribosomal subunits
b) 30 ribosomal subunits
c) 50 ribosomal subunits
d) 70 ribosomal subunits.

Q IV. Answer by True (T) or False (F) on the following statements
(10 marks, one for each)

71. The preparation of raw material is one of the down-stream processes in industrial fermentation.
a) T
b) F

72. Industrial biotechnology is industrial technology based on biology.
a) T
b) F

73. The suitable temperature for baker yeast production is nearly 30°C.
a) T
b) F

74. Active dry baker yeast is completely similar to instant active dry baker yeast.
a) T
b) F

75. Sugar cane molasses can be used for ethanol production without any treatment other than dilution to suitable concentration.
a) T
b) F

76. Fermentation of sugarcane molasses at 20 % sugar produced ethanol at 10: 10.2 % in fermented mash.
a) T
b) F

77. Date vinegar produced by acidification of fermented date juice using *Acetobacter aceti.*
a) T
b) F

78. Epoxidation of a steroid hormone increases their activity.
a) T
b) F

79. Streptomycin is consist of amino-sugars linked glycosidically.
a) T
b) F

80. Bacitracin is a tetracycline antibiotic produced by bacteria.
a) T
b) F

لاحظ: الإمتحان يحتوي علي 80 سؤال (درجة واحدة لكل سؤال) يقع في 6 صفحات

Good Luck...

Prof. Dr.: A. A. Zohri & Prof Dr: S. S. El-Maraghy

Assiut University Faculty of Science Botany and Microbiology Department	Host parasite relationship (B 366) Time allowed: 2 hours 2020-2021

Section I Final exam" 50 marks"

Q1 Shade the Correct Answer; A, B, C or D (One mark each)

1 The ability of the pathogen to cause a disease is called: A) Virulence B) Infection C) Pathogenesis D) Pathogenicity.

2 Following are the symptoms of plant diseases due to the appearance of the visible pathogen except: A) Mildews B) Wilts C) Rusts D) Smuts

3 The type of defense that minimize crop losses without restricting disease development. A) Disease escape B) Tolerance C) Immunity D) Resistance

4 An organism kills host tissues in advance of penetration is called:

A) Biotroph B) Necrotroph C) Autotroph D) Saprotroph

5 One of the following is not associated with hypertrophy:

A) Dwarfing B) Club root C) Warts D) Leaf curl

6 Organisms which always obtain their food in nature from living tissues on which they complete their life cycle are called:

A) Saprophyte B) Necrotroph C) Biotroph D) Autotroph

7 The rapid death and collapse of very young seedlingis called:
A) Canker B) Dry rot C) Scab D) Damping off

8 All of the following are considered dormant organs of pathogen serve as a source of survival except: A) Sclerotia B) Mycelial fragments C) Chlamydospores D) Oospores

9 The establishment of parasitic relationship between host and the parasite is called: A) Pathogenicity B) Pathogenesis C) Invasion D) Infection

10 The relationship between the parasite and the host is known as:
A) Parasite B) Pathogenicity C) Parasitism D) Penetration

11 Symptoms associated with Atrophy or Hypoplasia is called:
A) Witches brooms B) Cankers C) Dwarfing D) Club root

12 Antagonism is defined as: A) One organism is injured by another. B) One organism is benefit by another. C) Two organisms are injured D) Nothing from all mentioned before.

13 The capacity of a pathogen to invade and grow in its host is known as: A) Aggrssiveness B) Tolerance C) Elicitors D) disease escape

14 The following are animate causes of plant diseases except:

A) Flowering plants B) Protozoa C) Nematodes D) Atmospheric impurities

15 The death of tissues is called A) Necrosis B) Chlorosis C) Chromosis D) Pathogenesis

16 The propagules of the pathogen to be attached on their host surface have on their surface: A) Chlamydospores B) Appresorium C) Haustoria D) Mucilagenous sheath

17 Fungal spores first germinate forming: A) Stomata

B) Appresorium C) Haustoria D) Germ tube

18 The events constituting disease cycle is called: A) Pathogenesis.

B) Pathogenicity. C) Pathology D) Pathogen

19 In indirect penetration the germ tubes enter the host through:

A) Wounds. B) Intact plant surfaces. C) Floral parts. D) Root hairs.

20 The Science of Plant Pathology or Phytopathology has the following major objectives except: A) Study the causes of plant diseases. B) Study the mechanism of mitotic division in the cell. C) Study the host-pathogen relationship. D) Study the methods of controlling the disease.

21 Entry through non- cutinized surfaces is represented by one only of the following: A) Flowers. B) Stometa C) Lenticles D) Wounds

22 The propagules that initiate the infection are called: A) Sufficent inoculum B) Primary inoculum C) Secondary inoculum D) Inoculum

23 The natural opening which serve as a venues of entry for plant pathogens is: A) Lesions B) Injury C) Lenticle D) Wounds

24 The following are the most common necrotic symptoms except: A) Leaf spots B) Blights C) Wilts D) Damping off

25 The time lapsing between inoculation and appearance of symptoms is called: A) Invasion period B) Incubation period C) Resistant period D) Survival period

26 Organisms that derive the materials they need for growth from non-living materials is called; A) Parasites B) Halophytes C) Saprophytes D) Necrotroph.

27 The plant recovers as soon as the conditions (suplly of water) become favorable this type of wilting is called: A) Physiological wilt B) Pathological wit C) Histologial wilt D) Parasitical wilt

28 In absence of their cultivated host, animate pathogens must find alternate source of: A) Infection B) Penetration C) Incubation D) Survival.

29 Pythium debaryanum can infect 127 different plants within different families, it has: A) Narrow host range B) Wide host range C) Restricted host range D) Specific host range

30 The following suggestions have been put forward to explain why germ tube enters the host except: A) some germ tubes are negatively phototrophic. B) Thigmotropism. C) Chemotropism. D) Geotropism

31 The propagules that cause the spreading of the disease are called: A) Sufficent inoculum B) Primary inoculum C) Secondary inoculum D) Direct inoculum

32 All types of harmful changes in the plants is called: A) Disease B) Immunity C) Resistance D) Pathogenicity

33 All of the followings are examples of obligate Parasite except: A) Rust B) Pythium C) Smuts D) Powdery mildews.

34 The extreme degree of susceptibility in which rapid death of the host cells of infection site is called: A) Hypersensitivity B) Invasion C) Colonization D) Infection

35 Under ideal conditions of experiment where every advantage is given to the pathogen, inoculum potential that can cause successful infection is: A) high density of inoculum B) low density of inoculum C) even one spore D) Large number of spores

36 Some fungal spores germinate by producing other spores, e.g., teliospores produce A) Conidia B) Ascospores C) Basidiospores D) Zoospores

37 The germ tube of the pathogen attached itself on the host surface by special structure called: A) Infection thread B) Infection hypha C) Appressorium D) Penetration hypha

38 Spores of Tilletia sp. only germinate A) after exposure to temperature below 10 C B) as soon as they are fully formed C) until the following spring D) until the chains of spores are broken

39 The following are non-cutinized organs in plants except:

A) flowers B) Seedlings C) Buds D) wounds

40 Club root of cabbage is caused by A) Pythium deparyanum

B) Plasmodiophora brassicae C) Plasmopara viticola
D) Perenospora destructor

41 It denotes that the pathogen cannot establish parasitic relationship with the host A) Immunity B) Resistance C) Tolerance

D) Susceptibility

42 Varying symptoms characterizing a disease are collectively called: A) Symbiosis B) Antagonism C) Systemic infection D) Syndrom

43 Galls are symptoms associated with: A) Overgrowths B) Hypotrophy C) Atrophy D) Hypoplasia

44 Some pathogens are host specific because: A) Spores germinate only in presence of nutrients exuded by the host B) Spores germinate only in presence of nutrients exuded by the pathogen C) Many fungal pathogens must grow first before penetration D) Many fungal pathogens need fast multiplication before penetration

45 The only way of direct penetration occurs in case of : A) parasitic Higher plants B) Fungi C) Bacteria D) Viruses

46 Entry of fungal pathogen through stomata is considered: A) Direct penetration B) Indirect penetration C) Complicated penetration D) Simple penetration

47 Injuries and wounds caused by insects cannot be penetrated by A) Biotroph B) Necrotroph C) Hemibiotroph D) Autotroph

48 Yellowing due to lake of light is called: A) Clorosis B) Chromosis C) Etiolation D) Discoloration

49 The first four steps in pathogenesis in order are: A) Infection – Inoculation – Penetration – Invasion B) Inoculation – Infection - Penetration – Invasion C) Inoculation – Infection – Invasion - Penetration D) Inoculation – Penetration - Infection – Invasion

50 Once the stimulation for germination has been received by the spore, it goes towered the formation of A) Hyphae B) germ tube C) appressorium D) Haustorium

Section II Midterm, Oral, Activity "50 marks"

Q2 Write (T) for true statements or (F) for false statements :(2marks each)

51 ( ) Mildew is one of the symptoms due to appearance of the visible pathogen.

52 ( ) Leaf curl is a symptom associated with overgrowths.

53 ( ) Invasion is the spreading of the pathogen through the host.

54 ( ) When a spore germinates it generally produces a germ tube.

55 ( ) Necrotroph used to describe a parasite that kills host tissues in advance of penetration.

56 ( ) Unfavorable intensity of light is considered as one of the animate causes of plant disease.

57 ( ) All non-infectious diseases are transmissible.

58 ( ) Direct penetration occurs through intact plant surfaces.

59 ( ) In non-specialized pathogens like *Pythium,* a high density of inoculum is needed for success infection.

60 ( ) The pathogen should be susceptible for the success of infection.

61 ( ) Usually the obligate parasite are host specific.

62 ( ) Symptoms associated with overgrowths include Warts.

63 ( ) Hemibiotrophs obtain their food in nature from living tissues on which they complete their life cycle

64 ( ) In direct penetration pathogen exerts its own efforts to break the host barriers.

65 ( ) The word rust means sooty or charcoal-like powder.

66 ( ) Flowers are with non-cutinized surface through which pathogen can penetrate directly.

67 ( ) Indirect penetration can occur through injuries or wounds.

68 ( ) The germination process of spores is being stimulated by diffusion of secretions from the pathogen.

69 ( ) The infective propagules coming in contact with the living host are known as inoculum.

70 ( ) The environmental conditions should be favorable for the host for the success of infection.

71 ( ) Disease escape is the ability of a susceptible plant to avoid the damaging disease stress because of the way it grows.

72 ( ) Recognition system means the pathogen grows from the point of entry to varying extents without showing adverse effect on tissues.

73 ( ) Pathogens are the organisms that derive its nutrients for growth from living plant.

74 ( ) Aggrssiveness describes the capacity of a pathogen to invade the host.

75 ( ) Chlorosis is the yellowing resulted from infection by viruses, fungi, and bacteria.

WITH MY BEST WISHES

Prof. A. Y. Abdel-Malek

Department of Botany and Microbiology Faculty of Science Assiut University		Microbiology (Third level) - 2020/2021 Final Examination of Microbial Enzymes (394 B) Second Semester – 2 hours

Part I: Final Exam "50 Marks"

Q1: Put (T) for True statements or (F) for False statements: (1 mark each)

1-The active site is formed by groups of Fatty acids	( )
2-Enzymes of cellular respiration being located in Nucleus	( )
3-In induced fit hypothesis, a change in the configuration of an enzyme's active site induced by Substrate	( )
4-From enzymes properties, the specificity of binding depends on the precisely defined arrangement of Atoms at the active site.	( )
5-Q10 is the doubles or triples increase with every 20C rise in temperature.	( )
6-In reversible inhibition, an inhibitor attaches to the enzyme by Covalent bond	( )
7-In feedback inhibition, a metabolic reaction is blocked by Products	( )
8-In paper industry used xylanase enzyme for the bleaching.	( )
9-Enzymes accelerate reactions by decreasing ΔG.	( )
10-Wounds treated with lipase enzyme	( )
11-Cancer treated with L-asparagenase enzymes	( )
12-In diagnoses, high amylase in the blood serum indicate Acute pencreatites	( )
13- Enzymes facilitate the formation of the transition state by decreasing EC number	( )
14-*Thermus aquaticus* produces DNA polymerase	( )
15-In EC numbers the digit 3 represents the reaction posation	( )
16-*Aspergillus niger* used in production of the digestive enzymes	( )
17- Isomerase enzyme plays a role in bleaching of wheat and soybean flours	( )
18-*Aspergillus flavus* used in industries of cheeses	( )
19-In fuel production used protease enzyme	( )
20-Pectinase belongs transferases class	( )

Q2: Choose the correct answer; A,B,C or D: (1.5 marks each)

	A	B	C	D
21-Enzymes of DNA polymerase being located in	Mitochondria	Cytoplasm	Nucleus	All of them
22-The Allosteric site is formed by groups of	Amino acids	Fatty acids	Organic acids	All of them
23-The active site is typically a ------ on the surface of the protein	Pocket	Groove	Cleft	All of them
24-In irreversible inhibition, an inhibitor attaches to the enzyme by --------bond	Covalent	Hydrogen	Peptide	Ester
25-In paper industry used ---------- enzymes for the bleaching	Hemicellul-ase	Protease	Amylase	All of them
26-In corn syrup used ----------	Cellulose	Protease	Amylase	All of them
27-Autism treated with----------	Cellulose	Protease	Amylase	All of them
28-In diagnoses, high creatine kinase in the blood serum indicate ----------	Acute pencreatites	Hepatites	Myocardial infarction	All of them
29-The main factors that change the speed of enzymatic reactions are	Temperature	pH	inhibitors	All of them
30- enzymes can be denatured under extreme	High temp	Low pH	High pH	All of them
31- Active enzymes bound to their cofactors are called.	Holoenzymes	Apoenzyme	Coenzyme	No of them
32-EC6 is----------class	Isomerase	Hydrolase	Ligase	Transferase
33- Cellulase produced industrially by	*Bacillus subtilis*	*Saccharomyces cerevisiae*	*Trichoderma konigi*	*Rhizomucor miehi*
34-Eduard Buchner win Nobel prize in discovering the term	Vital force (ferments)	Enzyme	Yeast extract (zymase)	No of them
35-In linweaver-Burk, Vmax not changed in	Competitive	Non-competative	Uncompetitive	All of them
36-In linweaver-Burk, Km not changed in	Competitive	Non-competative	Uncompetitive	All of them
37-Increase sweetness of glucose by	Isomerase	Hydrolase	Lyase	Transferase
38-*Aspergillus oryzae* used in industries of	Cheeses	Papers	Textiles	Leathers
39-*Pyrococcus furiosus* produces	Amylase	Protease	Xylanase	DNA polymerase
40- Lipoxygenase belong-----class	Isomerase	Hydrolase	Oxido-reductase	Lyase

Part II: Mid term, Oral, Activity "30 Marks"

Q3: Put (T) for True statements or (F) for False statements: (1.5 marks each)

41-An enzyme speeds up a reaction by lowering the EA barrier.	( )
42-Enzymes have one (or more) active sites in their structure that have great specificity.	( )
43-EC 3 *Hydrolases* join two molecules with covalent bonds.	( )
44-EC numbers are four digits developed for nomenclature of enzymes, based on its mechanism.	( )
45-Enzyme regulation, the study of biochemical reaction rates (reaction velocity) catalyzed by an enzyme.	( )
46-K_m is the substrate concentration required for an enzyme to reach one-third its maximum velocity.	( )
47-Michaelis and Menton reported a mathematical relationship between substrate concentration and rate of product formed (or substrate consumed).	( )
48-Exoenzymes needed for biochemical pathways and function in inside the cell.	( )
49-Constitutive enzymes inducible, produced only in presence of specific substrates.	( )
50-In non-competitive inhibitors: Inhibitors do not enter the active site, but bind to allosteric site causing active site shape change.	( )
51-Apoenzymes are smaller than their substrate and have globular Shape.	( )
52- Prosthetic groups loosely bound to proteins.	( )
53-Cosubstrate groups tightly bound to proteins.	( )
54-***Vmax*** is the substrate concentration required for an enzyme to reach one-half its maximum velocity.	( )
55-Catalysts are substances that reduce the activation energy of a chemical reaction	( )
56-Catalysts are not consumed in the reactions they catalyze.	( )
57-There are two main models that explain the formation of the enzyme-substrate complex: the lock & key model and the induced fit model.	( )
58-Most enzymes act in pH between 2 and 5	( )
59-Some enzymes need other associated molecules to work. These molecules are called enzyme coenzymes and they can be mineral salts, or organic molecules.	( )
60- Many vitamins are enzyme cofactors that cannot be synthesized by the organism and must be obtained from the diet.	( )

Good luck ***Prof Dr. Hassan Hasaan***

Assiut University **Faculty of Science** **Botany & Microbiology Department**		**Second Semester: June 2021** **The time allowed: 2 hours** **Total marks: 50 +30 Marks** **Course: Plant Pathogenic Fungi (364 B)**

Answer the following questions: Q1A, Q1B (Final) and Q2 (Midterm + Oral + Activity)

Part I: Final Exam: Q1A: Choose the correct answer A, B or C (30 marks)

1. Biological control of *Rhizopus* on stored peaches and nectarines has been achieved by.....
   Ⓐ ***Aspergillus*** Ⓑ **Mycorrhizal fungi** Ⓒ **Yeasts**
2. The ergot bodies consist of a mass of vegetative fungal hyphae surrounded by.....
   Ⓐ **Grains** Ⓑ **Rind** Ⓒ **leaves**
3. *Pythium* vesicles contain 100 or more .....
   Ⓐ **Encyst spores** Ⓑ **Zoospores** Ⓒ **Resting spores**
4. *Phytophthora infestans* develop ..... on the lower leaf surfaces.
   Ⓐ **Water soaking** Ⓑ **Browning and rotting** Ⓒ **White bloom**
5. *Sclerospora graminicola* caused downy mildews on.....
   Ⓐ **Cereals** Ⓑ ***Helianthus*** Ⓒ **Cucurbits**
6. The pathogen is a non-mycelial, unicellular, holocarpic biotrophic chytrid fungus
   Ⓐ ***Phytophthora infestans*** Ⓑ ***Spongospora subterranea*** Ⓒ ***Synchytrium endobioticum***
7. Appearance of soot like mass of the fungal pathogen spores on host infected parts.
   Ⓐ **Rust disease** Ⓑ **Smut disease** Ⓒ ***Nectria* canker**
8. Black mold of onion caused by.....
   Ⓐ ***Taphrina deformans*** Ⓑ ***Aspergillus niger*** Ⓒ ***Aspergillus flavus***
9. Indirect losses of infected grape by *Plasmopara viticola* can result from premature defoliation of vines due to.....
   Ⓐ **Foliar infections** Ⓑ **Water-soaked** Ⓒ **Winter injury**
10. Zoospores of *Albugo candida*..... on host epidermis before infection.
    Ⓐ **Formed sporangium** Ⓑ **Divide meiotically** Ⓒ **Encyst**
11. The small sporangiophores and sporangia of *Plasmopara viticola* make up ..... growth
    Ⓐ **Soft rot** Ⓑ **Powdery mildew** Ⓒ **Downy mildew**
12. *Rhizopus* hyphae secrete pectinolytic enzymes, which break down and dissolve the ..... of the plant cells.
    Ⓐ **Pectic substances** Ⓑ **Cellulose** Ⓒ **Lignin**
13. *Pythium* antheridium produces ....., which enters the oogonium.
    Ⓐ **Nuclei** Ⓑ **Fertilization tube** Ⓒ **Spherical oogonia**
14. The anamorph of *Taphrina* is a single- celled budding yeast named .....
    Ⓐ ***Lalaria*** Ⓑ ***Pichia*** Ⓒ ***Candida***

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15. Fungal spores are disseminated by wind and infect the shoot of plant.

Ⓐ **Soil-borne disease** Ⓑ **Seed-borne disease** Ⓒ **Air-borne disease**

16. *Claviceps purpurea* develops a stage in flowering head part commonly called .....

Ⓐ **Honey dew** Ⓑ **Auxins** Ⓒ **Enzymes**

17. Young shoots infected by *Plasmopara viticola* are .....and become thickened and distorted.

Ⓐ **Rotting** Ⓑ **Stunted** Ⓒ **Wrinkled**

18. Dwarf bunt of wheat caused by.....

Ⓐ ***Tilletia contraversa*** Ⓑ ***Urocystis cepulae*** Ⓒ ***Tilletia barclayana***

19. *Phyllactinea corylea* causes Powdery mildew of..... .....

Ⓐ **Oak** Ⓑ **Peach** Ⓒ **Apple**

20. Infected peach leaves by *Taphrina deformans* are .....

Ⓐ **Deformed** Ⓑ **Puckered and curled** Ⓒ **Both A & B**

21. Resting Sporangia of *Synchytrium endobioticum* divide meiotically and germinate producing .....

Ⓐ **Zoospores** Ⓑ **Prosporangia** Ⓒ **Zygote**

22. .....is the development of necrotic spots resulting from rapid death of cells.

Ⓐ **Hypersensitivity** Ⓑ **Susceptibility** Ⓒ **Resistance**

23. *Plasmodiophora brassicae* stimulates abnormal growth of affected parts, resulting in …

Ⓐ **Swollen clubs' roots** Ⓑ **Malformed leaves** Ⓒ **Powdery scab**

24. Powdery mildew fungi tend to grow.....on plant surfaces.

Ⓐ **Epiphytically** Ⓑ **Superficially** Ⓒ **Both A & B**

25. Conidiophores with short stipe of one or more cells, conidiogenous cell and a chain of conidia are called.....

Ⓐ **Ovulariopsis** Ⓑ **Oidium** Ⓒ **Oidiopsis**

26. Apple fruits infected by *Venturia inaequalis* are less marketable due to .....

Ⓐ **Reduce fruit quality** Ⓑ **Black fungal lesions** Ⓒ **Both A & B**

27. ..... are the classic mushrooms and toadstools, composed of highly complex fruiting bodies.

Ⓐ **Uredinomycetes** Ⓑ **Ustilagomycetes** Ⓒ **Hymenomycetes**

28. *Pythium* species cause seedling.....

Ⓐ **Emergence** Ⓑ **Blight** Ⓒ **Soft rot**

29. Infections on young peach leaves by *Taphrina deformans* occur at temperatures of ....

Ⓐ **5-10 °C** Ⓑ **10-21°C** Ⓒ **7 °C**

30. Life cycle of *Phytophthora infestans* is.....

Ⓐ **Polycyclic** Ⓑ **Monocyclic** Ⓒ **Both A & B**

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Q1B: Answer (T) for True sentences or (F) for False sentences (20 marks)

31. High plant resistance with low susceptibility is approaches immunity.
32. The pathogen advances through the tissues of host to varying extent is colonization.
33. Holocarpic: denoting a fungus in which the entire thallus is differentiated into a reproductive sporangium when mature.
34. Irregular brown depressions are formed in potato tubers infected by black warts diseases.
35. A mixture of copper sulfate and hydrated lime was soon shown to be effective against the late blight of potato.
36. Resting sporangia of *Synchytrium endobioticum* divide meiotically and germinate producing prosporangia in which uniflagellate zoospores (n) are produced.
37. Inflorescences and flowers of Crucifers become thickened due to hypertrophy and hyperplasia of affected cells by *Albugo candida.*
38. *Peronospora parasitica* causes downy mildews on onion.
39. Berries infected with *Plasmopara viticola* turn light brown and soft, and under humid conditions are often covered with the downy-like growth of the fungus.
40. The optimum temperature for downy mildew of grape development is 25° to 28°C.
41. *Uncinula* appendages are simple and straight with bulb- like base.
42. *Plasmodiophora brassicae* infects susceptible host plants through root hairs.
43. *Spongospora* fungus is a vector of the potato mop-top virus.
44. *Taphrina deformans* causes the meristematic cells at root tip to proliferate quickly and randomly.
45. Loose smut of oat caused by *Ustilago avenae* is seedling infection.
46. The appressorium is a fungus structure that takes the nutrients from the plant.
47. Dutch elm disease results in the blockage of the xylem tissue within the tree.
48. Basidiomycetes are also key decomposers and include the soft rot fungi.
49. The crop should be stored and shipped at a temperature low enough to slow down the development of any infections.
50. The fertilized oogonium in *Pythium* life cycle produces a thick- walled oospore of which germinate directly or forming zygospores.

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Part II: Exam of Midterm + Oral + Activity

Q2: Answer (T) for True sentences or (F) for False sentences **(30 marks)**

51. *Taphrina deformans* ascospores often bud in a rather yeast-like manner.
52. *Aspergillus* causes blue and green mold rot of citrus and other fruits.
53. *Aspergillus flavus* infects corn kernels and groundnuts while still in the field.
54. The powdery mildew disease on older leaves appears at first as large white patches that cause little distortion but may eventually become necrotic.
55. *Rhizopus* soft rot occurs on fruits and vegetables.
56. Heterothallism is sexual reproduction occurs by fusion of cells from different sexes.
57. Oospore of Pythiaceae formed inside host tissue.
58. Downy mildew symptoms on the upper vine leaves can be seen as a delicate, dense, white to greyish, cotton-like growth.
59. Remove dead grape leaves and berries from vines and the ground after leaf drop are effective for controlling powdery mildew disease.
60. Zygomycetes may be characterized by usually having septate mycelia.
61. *Rhizopus* cause head rot of sunflower.
62. Affected fruit tissues by *Rhizopus* are firstly infected by yeasts and bacteria.
63. Seedlings infected by *Pythium* had emerged often showed water soaking and shriveling.
64. Infection by *Albugo portulacae* is spread by either oospore-infected seed or by mechanical movement of sporangia.
65. *Phytophthora nicotianae* causes black shank of tobacco.
66. Thallus of holocarpic fungus is differentiated into a reproductive cell when mature.
67. The zoospores of *Phytophthora infestans* released from sporangia are uniflagellated.
68. The fungus *Plasmopara viticola* causes direct yield losses by rotting shoots and roots.
69. Very long crop rotation with non-cruciferous crops is one of the club root disease management.
70. Aggressiveness is the capacity of a pathogen to invade and grow only outside host plant.
71. Ustilagomycetes are plant pathogens which can only grow and reproduce on their host species causing rusts diseases.
72. Rust of peanut caused by *Puccinia arachidis.*
73. The aecial stage in *Puccinia* life cycle occurs on lower surface of wheat leaves.
74. Loose smut of wheat and barley by *Ustilago nuda* is embryonic infection.
75. The Basidioma of Hymenomycetes have pores or gills, which are lined with basidia.
76. Black to dark grey-brown lesions on the plant surface of leaves is the symptom of apple scab.
77. *Venturia inaequalis* sexual reproduction occurs by basidiospores.
78. Saprophytes are organisms which derive their nutrition from dead organic matter.
79. Some pathogens survive as dormant mycelium in seeds or other host propagative structures.
80. *Rhizopus* fungal hyphae grow outward the fleshy organs through the wounds.

With My Best Wishes Dr Nivien Allam Nafady***