First Semester Exam (2023-2024)

Assiut University

Faculty of Science

Botany and Microbiology Department

Palynology 431B

Time: 2 hours

Total score: 50 marks

Q1: True or False (20 marks):

1. The term 'palynomorphs' refers to pollen grains, spores and certain microscopic plankton organisms in fossil form only.

2. In Erdtman's 1969 system, the term "Sexine" is evident.

3. The ectexine is always lamellate in mature pollen grains of gymnosperms.

4. The principal stratification (ectexine, endexine, and intine) of the gymnosperm pollen wall is identical to that of angiosperms.

5. The perine is very thin, transparent, wrinkled and much wider layer found in gymnosperms.

6. The most common type of pollen composition in flowering plants is tetrads.

7. Pollen grains with a polar axis longer than the equatorial diameter are called prolate.

8. The number 655 refers to hexadizonoporate in NPC classification.

9. Apocolpium index is the ratio of the distance between the apices of two ectocolpi to its polar diameter.

10. Anther dehiscence goes through endothecium expansion then septum degenerating then stomium splitting, respectively.

11. Pollen wall development requires contributions from both the sporophytic and gametophytic tissues.

12. Pollen mother cells are encased in a matrix known as callose wall.

13. Pollen wall development goes through plasma membrane undulation, then primexine deposition, then probacula formation, respectively.

14. The intine is formed by the end of uninucleate stage.

15. Tapetosomes are specialized organs developed at tapetum and are originated from plastids.

16. In dioecious plants cross pollination becomes indispensable.

17. The flowers are large or if small they are grouped to form a large mass in Entomophily.

18. Internal foramen is a more or less continuous layer within the outer sexine/ectexine composed of laterally connected parts of columellae.

19. The sporopollenin composition is fully understood.

20. A pollen grain with one pore at its distal pole can be considered as a heteropolar grain.

Q2: Illustrate with diagrams only 2 of the following (10 marks):

1. Pollen wall stratification (the two models).

2. Steps of Megagametogenesis.

3. Pollen grains of gymnosperms and spores of pteridophyta.

4. Microsporogenesis.

Q3: Discuss only 3 of the following (15 marks):

1. Edges of apertures.

2. Pollen wall development.

3. Five types of ornamentation with elements larger than 1 μm.

4. Dichogamy.

5. Three applications of palynology.

Q4: Give the meaning of the following codes according to the NPC-system (5 marks):

a. 136 **b.** 102 **c.** 655 **d.** 343 **e.** 764

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With my best wishes

Mostafa Aboulela

Assiut University – Faculty of Science
Department of Botany and Microbiology

Course: Biological Control (B 499)
Date: January, 03, 2024
Time allowed: 2 hours

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Serial	Choose the correct answer .....(Total marks=50)		
1	Sublancin is a microbial metabolite with antagonistic activity towards:		
	a- Leaf hoppers	b- Gram +ve bacteria	c-Nematodes
2	A member of iturin family with strong antifungal and hemolytic activities		
	a- Bacillomycin-D	b- Amylase	c- Ethanol
3	Ribosomally synthesized component of the biofilm matrix of *Bacillus subtilis*		
	a- Tas-A	b- Nemin	c- Chitin
4	A bacterial metabolite acts against filamentous fungi		
	a- Fengycin	b- Mitochondria	c- Penicillin
5	Lipopeptide compounds produced by *Bacillus amyloliquefaciens* are active against		
	a- Sclerotinia sclerotiorum	b- Nematode eggs	c- House fly
6	*Ampelomyces quisqualis* can be applied to control:		
	a- Blue rot of citrus	b- Root rot	c- Powdery mildews
7	Grey rot of strawberries can be controlled by spraying plants with:		
	a- Zoophthora radicans	b- *Gliocladium roseum*	c- Arbuscular mycorrhizae
8	*Epicoccum nigrum* can produce antimicrobial compounds such as:		
	a- Streptomycin	b- Flavipin	c- Alternariol
9	*Bacillus subtilis* is an effective biocontrol agent against:		
	a- *Ecchornia* sp.	b- Crown gall disease	c- Damping off diseases
10	One of the following can be used as a biofertilizer		
	a- Sclerotium rolfsii	*b- Zoophthora radicans*	*c- Pseudomonas aeruginosa*
11	Bacillomycin-D exhibits antibiosis against:		
	a- Cereal aphids	b- Mealy bugs	c- *Fusarium oxysporum*
12	*Sclerotinia* and *Sclerotium* species can be attacked by:		
	a-*Alternaia citri*	b- *Coniothyrium minitans*	c- *Fusarium solani*
13	Mosquito larvae cabe contolled biologically by:		
	a- *Peronospora*	b- *Coelomomyces* sp.	c- Aphids
14	Induced systemic resistance in plants can be enhanced by treatment with:		
	a- Botrytis cinerea	*b- Trichoderma viride*	*c- Phytophthora*
15	*Ampelomyces quisqualis* produces a lot of conidia oozing from:		
	a- Perithecia	b- Sporangia	c- Pycnidia
16	Fungal pathogens of insects penetrate their hosts with the aid of:		
	a- Hyphagens	b- Exoskeleton	c- Chitinases
17	Each trichospore produced by *Smittium culisetae* is provided with:		
	a- Three flagella	b- Two cilia	c- One appendage
18	*Entomophthora verulenta* can be formulated in a phosphate buffer containing:		
	a- Zygospores	b- Ascospores	c- Zoospores
19	Red Palm weevil can be controlled biologically by:		
	a- *Beauveria bassiana*	b- *Saprolegnia*	c- *Coelomomyces*
20	One of the fast growing green colored fungi active in mycoparasitism is:		
	a- Aspergillus niger	b- *Trichoderma virens*	c- *Pseudomona*
21	Non septate, elongated, unicellular conidia are produced by phialides of:		
	a- Metarhizium	b- *Arthobotrys*	c- *Catenaria*

22	Sympodially produced conidia can be observed on Rachis-like cells of:		
	a- *Beauveria bassiana*	b- *Streptomyces*	c- *Ampelomyces*
23	Several insects are killed by some toxic metabolites of *Metarhizium* such as:		
	a- Gibberellic acid	b- Destruxins	c- Epicoccin
24	On culture media, colonies of *Paecilomyces lilacinus* is		
	a- Blue	b- Purple	c- Green
25	Sickle-shaped (curved) conidia are produced by a nematophagus fungus called:		
	a- *Sclerotium*	b- *Harposporium*	c- *Alternaria*
26	Nematodes can be trapped and killed by some fungi belonging to:		
	a- *Fusarium*	b- *Ampelomyces*	c- *Arthrobotrys*
27	A bioagent used for protection of trees against crown gall disease:		
	a- Agrobacterium radiobacter	*b- Agrobacterium tumifaciens*	*c- Aspergillus ochraceus*
28	Late blight of potato can be controlled biologically by certain species of:		
	a- *Coniothyrium minitans*	b- *Chaetomium*	c- *Myrothecium*
29	Iturin-A, Surfactin and fungycin are bioactive compounds produced by:		
	a- *Bacillus amyloliquifaciens*	b- *Sclerotinia* sp.	c- *Pythium oligandrum*
30	*Trichoderma harzianum* attack plant pathogens by several weapons including:		
	a-Toxins and lytic enzymes	b-Rhizoids	c- Zoospores
31	*Sclerotinia* species form dark colored sclorotia that germinate producing:		
	a- Apothecia	b- Perithecia	c- Cleistothecia
32	Copepod (fish lice) is the secondary alternative host in the life cycle of:		
	a- *Coelomomyces*	b- *Streptomyces*	c- Adult mosquitoes
33	*Coniothyrium minitans* is formulated as water dispersible granules containing:		
	a- Pycnospores	b- Azygospores	c- Rhizoids
34	Plant diseases caused by *Rhizoctonia solani* can be controlled by:		
	a- *Rhizopus*	b- *Trichoderma*	c- *Aspergillus*
35	A compound produced by *Bacillus subtilis* showing antibiosis against *Pythium* species		
	a- Gliotoxin	b- Mycosubtilin	c- verrucarin
36	*Monacrosporium cionopagum* attacks nematodes by:		
	a- Resting sporangia	b- Adhesive branches	c- Zoospores
37	Villose conidia with hair-like appendages are produced in old cultures of:		
	a- *Zoophthora radicans*	b- *Colletotrichum* sp.	c- *Conidiobolus coronatus*
38	*Smittium culisetae* is highly lethal to:		
	a- Anopheles larvae	d- Arachnids	c- Aphids
39	Overgrowth of bioagents on plant pathogenic fungi is called:		
	a-Mycoparasitism	b-Synergism	c-Mutualism
40	Zwittermicin-A is an antibiotic produced by:		
	a-*Bacillus cereus*	*b-Phytophthora* species	c- *Streptomyces* species
41	*Trichoderma harzianum* can be sprayed for protection of plants against infection by:		
	a- Anthracnose	c- *Sclerotinia* species	c- *Monacrosporium*
42	*Entomophthora muscae* is the main pathogen of:		
	a- Potato plants	b- Date palm weevil	c- House flies

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43	An entomopathogenic fungus produces capilliconidiophores:		
	a- *Streptomyces*	b- *Neozygitis*	c- *Conidiobolus*
44	One of the endoparasitic fungal species that destroys nematodes		
	a- Streptomyces	b-Catenaria anguillulae	c-Entomophthora
45	Adhesive networks are produced by some predaceous fungi such as:		
	a- *Streptomyces* spp.	*b- Arthrobotrys oligospora*	c-Vesicular mycorhizae
46	A bacterial bioagent contains compounds toxic to the caterpillars, mosquitoes:		
	a- *Cercospora* sp.	*b- Bacillus thuringiensis*	*c- Pythium oligandrum*
47	Non-constricting rings are formed on prostrate hyphae of:		
	a-Rhizoctonia solani	*b-Dactylaria candida*	*c-Trichoderma harzianum*
48	Formation of fungal traps is stimulated by compounds in nematode body such as:		
	a- Chaetomin	b- Nemin	c- Abscisic acid
49	Sporangia of *Catenria* are formed within nematode body and produce		
	a- Biflagellate zoospores	b- Uniflagellate zoospores	c- Non-motile spores
50	*Dactylaria candida* and *Nematoctonus* produce adhesive knobs that can kill:		
	a- *Escherichia coli*	b- white fly	c- Nematodes

========== End of Questions ==========

Best wishes,

Professor Dr. Ahmad M. Moharram

1st Semester Final Exam for Soil microbiology B491 (2023-2024)
Time allowed: 2 hours
Score (50 marks)
الاختبار مطبوع على وجهي الورقة

Question 1: Label the correct sentence with (√) and wrong one with (x), and rewrite the sentence correctly if it is wrong. (10 marks)

A. Chitin is a complex carbohydrate of galacturonic acid units. ( )

B. Starch is a carbohydrate consisting of a large number of glucose units joined by β-(1-6) bond. ( )

C. The mineral portion of the soil is divided according to the particle size into silt and clay. ( )

D. Lignin is an insoluble complex of vanillin, ferulic acid, guaiacol and catechol. ( )

E. The main hexoses (C6) in hemicellulose are glucose, xylose and galactose. ( )

Question 2: Choose the correct answer. (10 marks)

A. …… is methane-forming bacteria.

a. *Sarcina* b. *Clostridium*

c. *Methanosarcina* d. *E. coli*

B. ..... can readily be taken by the plants and are beneficial to agriculture.

a. Sulphates b. Hydrogen sulphide

c. Elemental sulphur d. Sulphuric acid

C. Antibiotic producer soil microorganisms, that are similar to both bacteria and fungi is.....

a. *Actinomyces* b. *Rhizoctonia*

c. Nematodes d. None of them

D. The enzyme that responsible for breakdown of starch into glucose is.....

a. Glucosidase b. Gluconase

c. Glucoamylase d. Pullulanase

E. ..... exhibited the best role in cementing and binding of soil particles.

a. Virus b. Algae

c. Fungi d. Prion

Question 3: Identify only 5 of the following: (10 marks)

a) Phosphorus solubilization b) Ammonification c) Soil pH

d) Autotrophic bacteria e) Environmental factors f) Soil ecosystem

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Question 4: Give a short account on only 4 of the following: (10 marks)

a) Pectin structure and degradation.
b) Sulphur cycle in nature.
c) Soil as a living system.
d) Symbiotic nitrogen fixation.
e) Soil microbes and soil structure.

Question 5: Write in details on only 2 of the following. (10 marks)

a) Cellulose degradation in soil.
b) Biodegradation of keratins.
c) Biochemistry of methane production.

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With my best wishes
Prof. Dr. Mohamed Hashem

كلية العلوم جامعة أسيوط Botany and Microbiology Department	First semester Final exam. (2023-2024) Seed Biology (Code : 411 B) For Under Graduate students (4th level) Date: 23/1/2024 Time allowed 2 hours	جامعة أسيوط Assiut University

Answer the following questions ..... 50 marks

I. Describe in details 2 only of the following..... (2×10 = 20 marks)

1. Types of seed dormancy **(only 2)**.
2. Carbohydrates as reserved food material of Endosperm.
3. Mobilization of Reserves during Seed Germination.

II. Shortly explain 4 only of the following ..... (4×5 = 20 marks)

1. Tests of seed viability **(only 2)**.
2. Phytochrome and Reversible Red-Far-red Control of Germination
3. The major cell types of major grasses endosperm (diagrammatically).
4. Role of Lectins in seed self-defense.
5. Plumed seeds and plumed fruits.

III. Define 5 only of the following ..... (5×2 = 10 marks)

1. Photoblastic seeds
2. Zoochory
3. Orthodox *vs*. recalcitrant
4. Pre-harvest sprouting
5. Perisperm
6. Anthropochory

Best wishes

Prof. Dr. Suzan Abdel-Moniem
Professor of Plant Ecology
Botany and Microbiology Department

Dr. Ahmed Amro
Assisstant Professor
Botany and Microbiology Department

Faculty of Science Botany and Microbiology Dept.		كليه العلوم قسم النبات والميكروبيولوجى
Instrumental bioanalysis (B453) Time: 2 hours Marks:50 marks		2023/2024 Level: Fourth

Answer the following two questions in four papers

First Question: Choose the correct answer of the following:- (30 marks)

1. It was found by ..... that the intensity of the transmitted light decreases exponentially as the length of the light path through the sample increases.
   a) Lambert b) Beer c) Beer-lambert
2. The disadvantage of ..... buffer is limited solubility.
   a) Citrate b) Phosphate c) Carbonate
3. In..... Lamp: ultraviolet Light (160-375 nm)
   a)Tungsten b)Fluorescent c)Deuterium
4. Spectrophotometers are used to identify organic compounds by determining the.....
   a)Concentration b) Absorption maxima c) Path length
5. One of the most widely used.....methods for detection of infectious diseases is (ELISA).
   a)EIA b)FIA c)RIA
6. .....lyse cells, including liquid homogenization, high frequency sound waves, freeze/thaw cycles and manual grinding.
   a)Chemically b)Biologically c) Physically
7. The .....region extends from about 2.5μm to 16 μm.
   a) far-infrared b)near-infrared c) infrared
8. ..... immunoassay produce light and these emissions are measured by a light detector.
   a)Nephelometry b) Particle c) Chemiluminescent
9. ..... techniques are used to measure the concentration of solutes in solution by measuring the amount of the light that is absorbed by the solution.
   a) Spectrophotometer b) UV spectrometer c)a&b
10. The ..... region extends from about 10 to 380 nm.
    a)Ultraviolet b) Infrared c) Far-infrared

11.To prevent buffer contamination can be.....

a) Mixed with 0.02% sodium azide b) Stored at 4°C c)a&b

12."....." rinse the electrode with mild detergent (B530) or methanol.

a) Bacterial growth b)Inorganic deposits c) Oil and grease

13.....is the device in which boiling temperature of water is increased with increase in pressure.

a) Autoclave b) incubator c)laminar flow

14.....rotor, not suitable for pelleting applications but is most efficient for isopycnic.

a)Vertical b) swinging bucket c)a&b

15.Plastic tubes from..... have a higher speed tolerance and can withstand RCFs as high as 5000 x g.

a) polystyrene b) polypropylene c)a&b

16.Time of centrifugation is important in.....

a)Rate-zonal b) Isopycnic centrifugation c)a&b

17.Centrifuge take tubes of small volume .....

a)Microcentrifuges b) Small Benchtop c)Ultracentrifuges

18..... is the ratio of intensity of light of leaving solution to the intensity of light entering to solution.

a)Absorbance b) Reflection c) Transmittance

19..... is a form of liquid chromatography that utilizes small size columns and higher mobile phase pressures.

a)HPLC b)TLC c)PC

20.....phase chromatography if the matrix support is non polar (C-18).

a) Forward b) Bonded c) Reverse

21.Cellulose filter paper acts as ..... on which separation of compounds occurs.

a) Stationary phase b) An inert support c)An immobilized phase

22.They will have relatively ..... R_f values when both solvent and sample are nonpolar in paper chromatography.

a)High b)Low c)Similar

23.High-performance liquid chromatography is the .....most widely used laboratory instrument.

a)First b)Second c) Third

24.Mobile phase is liquid or gas in..... chromatography

a)Adsorption B) Ion exchange C) Gel membrane

25..... retention times by adding more water to the mobile phase

a)Increase b)Decreased c)Not change

26.In .....elution, sudden change in the composition of the mobile phase is followed by a period where the mobile phase is held constant.

a)Isocratic b)Linear c)Step wise

27..... used in analytical chemistry for separating and analyzing compounds that can be vaporized without decomposition.

a)GC b) HPLC c) PC

28.In ..... centrifugation density of the sample solution must be less than that of the lowest density portion of the gradient.

a)Rate zonal b) Isopycnic Density-Gradient c) Differential

29.Microtiter plat is a plastic plate that contains..... wells.

a)92 b)94 c)96

30 The ..... is the solvent that will carry the analyte.

a)Eluate b)Eluent c)Sample

Second Question:Write correct (√) or false (×) :- **(20 marks)**

31 Combined electrodes are better stored immersed in the bridge electrolyte (often KCl 4 M). ( )

32 In chromatography, partition only happens between immiscible solvents which don't mix with each other. ( )

33 Electromagnetic radiation is a type of energy that is transmitted through space as a transverse wave at constant velocity. ( )

34 FIA methods have greater analytical sensitivity than EIA methods. ( )

35 Washing solution is a buffer that removes bound antibodies floating in the well. ( )

36 Used NaCl and KBr crystals for IR wave length. ( )

37 Sample preparation may be the most time-consuming step in *ananalysis.* ( )

38 The Henderson-Hasselbalch equation is valid in the pH range of 3 to 11. ( )

39 The disadvantages of tris buffers are binding to some protein and forms metal complex. ( )

40 The pH of the working buffer should be tested after all the components (EDTA, DTT & Mg^{2+}) have been added. ( )

41 A pH meter is an electronic device used for measuring the pH of a liquid and solid solution. ( )

42 Clean your electrode regularly with pepsin to prevent blocking of the diaphragm with sulfides. ( )

43 The *g*-force or relative centrifugal force (RCF) in a rotor tube decreases linearly with the radius. ( )

44 The color of the filter in colorimeter is complementary to the solution. ( )

45 Flamephtometer used in inorganic chemical analysis to analyze the elemental composition of samples. ( )

46 Spectrophotometers and colorimeters are instruments that measure color intensities of solutions. ( )

47 Thin layer chromatography is a separation technique in which the stationary phase is present on a plane. ( )

48 A sorbent is a stationary phase containing column used in HPLC. ( )

49 RCF= $1.21 \times 10^{-5} \times r \times (\text{rpm})^2$. ( )

50 Gas chromatography is also known as gas–liquid partition chromatography. ( )

The end of the questions

Good luck Dr/ Eman Aldaby