Faculty of Science Botany& Microbiology Department		كلية العلوم قسم النبات والميكروبيولوجى
Ecology of Drought& Halophytic Plants N 442 **Time: Two hours** **Total degree: 60 marks**		**Second semester exam - the academic year 2020/2021** **Fourth Level** **Exam date: Monday, 21/6/2021**

Q1- Please choose the right answer.

1- Drought-.....are annuals or short- lived vascular plants that germinate after heavy rainfall to leach out the inhibitors and to support growth.

a- Deciduous b- Resistant c- Escaping

2..... Plants have underground organs full of water (rhizome, tuber, bulb and corn) that can survive periods of drought, being protected from excessive water loss by the soil.

a- Succulent b- Geophytes c- CAM

3- Drought..... Xerophytes, these plants have high stomatal conductance and high rates of photosynthesis and transpiration when water is available but lose (shed) their leaves and enter dormancy under conditions of low water potential.

a- Deciduous b- Resistant c- Escaping

4- Drought-..... Xerophytes Plants that cannot escape periods of drought can adapt to these conditions by avoidance and/or tolerance.

a- Deciduous b- Resistant c- Escaping

5- Avoidant Plants (.....) The plants can avoid and delay the drought by the mechanisms that enable the plant to maintain favorable tissue water content as long as possible despite dryness of air and soil.

a- arido-active b- arido-passive c- arido-tolerant

6- Improvement of water uptake from the soil by an extensive .....system with large active surface area.

a- shoot b- root c- leaves

7- Arido-..... refers to the species specific and adaptable capacity of protoplasm to endure severe loss of water.

a- tolerant b- passive c- active

8- Many species of thallophyta are capable of tolerating complete desiccation. Most ..... can withstand a state of dryness for months or even years resuming metabolic activity as soon as they are moistened again.

a- rhizome b- lichen c- tuber

9- The ..... cuticle covering the plant body resists evaporational losses (e.g. cactus) and stomata open at night, keeping water loss to a minimum level.

a- thin b - thick c- no

10- In many plants the mucilage gum and tannins are commonly found in ..... (e.g. Bandsia leaf).

a- epidermis b- hypodermis c- roots

11- In many xerophytes, the underside of the leaves is covered with matted epidermal ..... (Leaf pubescence). ..... may also over the entire aerial part of the plant.

a- hairs b- cutinis c- mucilage gum

12- Xerophytes that possess abundant hair on their leaves and stems are commonly called ..... xerophy.

a- monophyllus b- diplophyllus c- trichophyllus

13- ..... commonly found in xerophytic leaves layer than in mesophytes. It is either found in-groups or in continuous sheets (e.g. in Ammophila).

a-Parenchyma b- Sclerenchyma c- Collenchyma

14- Xerophytes with reduced leaves are known as ....., as needle leaves of gymnosperms.

a- microphyllous b- malacophyllous c- sclerophyllous

15- The presence of storage tissues and mucilaginous substances are characteristic to many fleshy xerophytes (.....).

a- microphyllous b- malacophyllous c- sclerophyllous

16- ..... is the suberization of cell walls of outer layer of the root cap and the region where the exodermis begins to form.

a- Microphyllous b- Malacophyllous c- Metacutiztion

17- ..... plants possess an extraordinarily high affinity for CO_2 and a low, largely temperature-independent CO_2 compensation point, which usually lies below the limits of determination.

a- C_3 b- C_4 c- CAM

18- The grasses (family Poaceae or Gramineae) and sedges (family Cyperaceae) comprise roughly 79% of the total number of.....species.

a- C_3 b C_4 c- CAM

19- Succulents (e.g. Opuntia ficus-indica) are able to store large amounts of acids, particularly malate, in their..... .

a- roots b- flowers c- fleshy leaves or shoots

20- ..... of productivity is the ratio between (aboveground) gain in biomass and loss of water during the production of that biomass; the water loss may refer to total transpiration.

a- Water use efficiency b- CAM c- C_4

21- ..... is considered to be one of the key hormones mediating the response of plants to environmental stresses including drought and salinity.

a- Glucose b- Fructose c- Abscisic acid

22- .....is defined as the lowering of the solute potential in response to water stress, or it is the net accumulation of solutes after the plant has been exposed to drought.

a- Osmotic adjustment b- Metacutiztion c- Trichophyllus

23- Accumulation of ..... under water stress has been taken as an index for determining the drought tolerance potentials of many plants.

a- glucose b- fructose c- amino acids

24- ..... accumulation seems to be a nitrogen source available for recovery from stress and for restoration of growth.

a- Proline b- Cutin c- Subrin

25- Accumulation of ..... under draught stress, may play a role in osmoregulation and service as available source of carbon and nitrogen Phanerophytes.

a- glucose b- fructose c- amino acids

26- Drought-escaping (arido-passive) are plants have high stomatal conductance and high rates of photosynthesis and transpiration when water is available but lose (shed) their leaves and enter dormancy under conditions of low water potential.

a) True

b) False

27- Geophytes have underground organs full of water During the rainy season they sprout immediately, utilizing stored carbohydrates and soon flowers and bears fruits.

a) True

b) False

28- Drought-Deciduous xerophytes are plants have high stomatal conductance and high rates of photosynthesis and transpiration when water is available but lose (shed) their leaves and enter dormancy under conditions of low water potential.

a) True

b) False

29- Drought-Resistant Xerophytes Plants that cannot escape periods of drought can adapt to these conditions by avoidance and/or tolerance.

a) True

b) False

30- Arido-tolerant are the plants can avoid and delay the drought by the mechanisms that enable the plant to maintain favorable tissue water content as long as possible despite dryness of air and soil.

a) True

b) False

31- Arido-passive are drought tolerance refers to the species specific and adaptable capacity of protoplasm to endure severe loss of water.

a) True

b) False

32- Reduction of water loss, through increasing diffusion resistance of the shoot surface (closure of stomata and effective cuticular protection against transpiration as will as a rise in the abscisic acid (ABA) level in the plant).

a) True

b) False

33- Reduction of the transpiring surface by folding and rolling up of the leaves (e.g. grasses), and abscission of leaves.

a) True

b) False

34- Water storage within the storage tissue and massive organs (trunks and larger branches of trees, and underground storage organs of herbaceous plants) become very significant during prolonged drought.

a) True

b) False

35- Water conducting capacity is decreased by enlarging the area of the conducting system (more xylem, dense leaf venation) and reducing the transport distance (shorter internodes).

a) True

b) False

36- The succulent water-storing species form a very distinct ecological group of desiccation avoidant xerophytes. They can survive long periods without any external water supply and remain metabolically active during drought.

a) True

b) False

37- Tolerance of desiccation is rare in vegetative parts of plants, while numerous at other organisms such as yeast cells, bacterial and fungal spores.

a) True

b) False

38- Deep and vigorous root system, decreased efficiency of moisture absorption.

a) True

b) False

39- Presence of multiple epidermis in order to the protection against high evaporate damaged in some xerophytes (e.g. Casuarina).

a) True

b) False

40- In many xerophytes in addition to a cutinized epidermis, single to multilayered hypodermis is also present as in Banksia leaves.

a) True

b) False

41- In many cases it may present a sheet of fibrous tissue or a layer of sclereids in many xerophytes.

a) True

b) False

42- In many plants the mucilage gum and tannins are commonly found in Phloem (e.g. Bandsia leaf).

a) True

b) False

43- In many xerophytes, the underside of the leaves is covered with matted epidermal hairs (Leaf pubescence) Hairs may also over the entire aerial part of the plant.

a) True

b) False

44- Xerophytes that possess abundant hair on their leaves and stems are commonly called monophyllus xerophytes.

a) True

b) False

45- The functions of hairs include hindrance of the diffusion of gases across the leaf air interface, thus they will prevent rapid evaporation through stomata and reduce air movement then prevents water loss.

a) True

b) False

46- The functions of hairs include increase of light absorption during condition of high temperature and drought.

a) True

b) False

47- Parenchyma commonly found in xerophytic leaves layer than in mesophytes. It is either found in-groups or in continuous sheets (e.g. in Ammophila).

a) True

b) False

48- The xerophytes that posses heavy sclerification of the leaves are known as sclerophyllous xerophytes.

a) True

b) False

49- Small Specific Leaf Area (SLA). This phenomena is characteristic for xerophytes by rolling of the leaves or reducing them surface.

a) True

b) False

50- Xerophytes with reduced leaves are known as microphyllous, as needle leaves of gymnosperms.

a) True

b) False

Oral Exam

51- The presence of storage tissues and mucilaginous substances are characteristic to hydrophytes.

a) True

b) False

52- In the xerophytic leaves the palisade is abundant and compactly arranged (e.g. in Banksia leaves) to improve the photosynthesis during drought.

a) True

b) False

53- Metacutiztion is the suberization of cell walls of outer layer of the root cap and the region where the exodermis begins to form.

a) True

b) False

54- Photosynthesis is less sensitive to dehydration than other metabolic process (e.g. respiration).

a) True

b) False

55- There are two concentrically arranged cell layers around the vascular bundles in C_4 plants.

a) True

b) False

56- C_3 plants (e.g. Leptadenia, Capparis, etc) have photosynthetic pathway less adapted to drought conditions than that in C4 plants (e.g. F. Poaceae).

a) True

b) False

57- C_3 plants showed that rebulose biphosphate carboxylase oxygenase (RUBISCO) and the other enzymes of the Calvin cycle are exclusively located in the chloroplasts of bundle sheath cells.

a) True

b) False

58- CAM plants able to fix CO_2 in dark during the carboxylating part of the C_4 decarboxlate cycle.

a) True

b) False

59- High water use efficiency (WUE) refers to the amount of water lost during the production of biomass or the fixation of CO_2 in photosynthesis.

a) True

b) False

60- Water use efficiency (WUE) of plants depends on stomatal conductance and on differences in vapor pressure in the leaf's intercellular spaces and that in the air.

a) True

b) False

With my best wishes

Prof. Dr. Hanaa Kamal Galal

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Department of Botany & Microbiology

جامعة أسيوط
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Microbiology Students, Level 4 Final Exam 2020-2021

Actinomycetes (472 B) Time allowed: 2 hours

Answer the following questions: (80 Marks)

Q1. Choose the correct answer for the following: (50 Marks) **Final**

1- **The species ..... shows fragmenting substrate mycelia and limited aerial mycelia.**

a-*Nocardia* b- *Streptomyces* c- *Actinomyces* d- *Thermomonospora*

2- **The antibiotic ..... was the first to treat tuberculosis**

a- Streptomycin b- Kanamycin c- Neomycin d- Tetracycline

3- **The first chemical synthesized antibiotic was .....**

a- Kanamycin b- Chloramphenicol c-Tetracycline d- Streptomycin

4- **The common scab disease in beet caused by *Sreptomyces* .....**

a- *scabies* b- *endus* c- *fraidae* d-*antibioticus*

5- **Actinomycosis caused by .....**

a- *Actinomyces israelii* b- *Actinomyces meyeri* c- *Nocardia* sp. d- *Mycobacterium*

6- **Antibiotic ..... used in typhoid treatment**

a-Kanamycin b- Chloramphenicol c-Tetracycline d- Streptomycin

7- **The main feature of prokaryotic organisms is .....**

a-absence of protein synthesis b- absence of nuclear material

c- absence of nuclear envelope d- absence of locomotion

8- **Enzymes are chemically .....**

a-lipids b-carbohydrates c-proteins d-sterols

9- **β-lactam ring is present in .....**

a- Streptomycin b- Neomycin c-Tetracycline d- Thienamycin

10- **Ziehl-Neelson stain is a .....**

a-simple stain b- differential stain c- counter stain d- none of these

11- **Ariel mycelia are called ..... hyphae.**

a- primary b- reproductive c-substrate d-all of these

12- ***Mycobacterium tuberculosis* is ..... bacteria and grow in .....condition**

a- G+ve- anaerobic b- Acid fast – anaerobic C- Acid fast-aerobic d- G-ve- anaerobic

13- ***Actinomyces israelii* live in .....condition.**

a- Aerobic b- Anaerobic c- Facultative anaerobic d-Microaerobic

14- **The spores of *Thermomonospora* are called .....**

a- Zoospores b-Arthrospores C-Sporangiospores d-Aleuriospores

15- **Indol acetic acid (IAA) produced in the dependent of .....**

a- Glutamine b- Tryptophan C- Indole d-Pyruvate

16- **The sporangiospores of *Frankia alni* are ..... and .....**

a- Circular and nonmotile b- circular and motile c- irregular and nonmotile d- irregular and motile

17- **Nonacid fast bacteria appear ..... colour with Ziel-Nelsson stain.**

a- red b- violoet c- blue d-yellow

18- **In diagonosis of actinomycosis appear of ..... granules.**

a- iron b- sulfur c-copper d-zinc

19- **Siderophore is a ..... structure with ..... molecular weight**

a-biological –low b- biological-high c-chemical-high d- chemical-low

20- ***Corenobacterium diphtheriae* causing .....**

a- typhoid b- diphtheria c- Nocardiosis d-tuberculosis

21- **The enzyme ..... responsible for starch hydrolysis**

a-cellulase b-hydrogenase c- nitrogenase d-amylase

22- **Nitrogease considers as an ..... enzyme**

a-oxygen resistant b-hydrogen sensitive c-oxygen sensitive d- all of these

23- **Siderophores consider as ..... mechanism on plant growth**

a-direct b-indirect c- both direct and indirect d- all of these

24- **The lipids on the membrane of diazovesicle of *Frankia* called .....**

a-hopanoids b-bialaphos c-sterols d- none of these

25- **Some *Frankia* strains have ability to secrete ..... Enzymes**

a-cellulases b-pectinases c-proteinases d- all of these

26- **In N_2-fixation, ... Produced as a byproduct**

a-nitrogen b-carbon c-hydrogen d- none of these

27- **Actinobacteria have ability to secrete ..... Enzymes**

a-cellulases b-pectinases c-keratinases d- all of these

28- ***Streptomyces*** **..... responsibles for a distinct soil odor**

a- *fradiae* b-*griseus* c-*antibioticus* d-*venezuelae*

29- ***Streptomyces*** **..... produce boromycin**

a- *fradiae* b-*griseus* c-*antibioticus* d- *venezuelae*

30- ***Streptomyces*** **..... produce chloramphenicol**

a- *fradiae* b-*griseus* c-*antibioticus* d- *venezuelae*

31- ***Streptomyces griseus*** **produce .....**

a-streptomycin b- Chloramphenicol c- Neomycin d- bialaphos

32- **Streptomycin belongs to the antibiotic class.....**

a-aminoglycosides b- macrolides c- lipopeptide d- chloramphenicol

33- **Boromycin belongs to the antibiotic** class.....

a-aminoglycosides b- macrolides c- lipopeptide d- tetracyclines

34- ***Streptomyces*** **..... produce the natural herbicide bialaphos**

a- *fradiae* *b-griseus* *c-antibioticus* *d- hygroscopicus*

35- **Actinobacteria are chain-forming bacteria that resembles in structure with.....**

a-algae b-archea c- hyphe of fungi d- angiosperm

36- **The habitat for the *Actinomyces israelii* is .....**

a-Anal canal b- genital tract c- oral cavity d-skin

37- **Actinomycetes are known as ....**

a-fungi b- algae c-archaea d- eubacteria

38- **What type of actinobacteria has mycolic acid in their outermost membrane**

a-*Corynebacterium* b- *Streptomyces* c- *Mycobacterium* *d- Actinomyces*

39- **What two distinct characteristics are typical of bacteria in the actinobacteria group**

a-Gram negative and low GC content b- Gram negative and high GC content

c- Gram positive and low GC content d- Gram positive and high GC content

40- ***Streptomyces*** **..... produce the antibiotic lomofungin**

a-fradiae *b-griseus* *c-antibioticus* *d-lomondensis*

41- ***Streptomyces platensis*** **produce the antineoplastic drug** .....

a-bleomycin b-neomycin c-migrastatin d- actionmycin

42- ..... **spp. have tubular sporangia and aleriospores on the substrate mycelium**

a-*Rhodococcus* b-*Nocardia* c-*Dactylosporangium* d-*Micromonospora*

43- ..... **spp. have rapidly fragmenting substrate mycelium**

a-*Rhodococcus* b-*Nocardia* c-*Dactylosporangium* d-*Micromonospora*

44- **Example of actinobacterial as a normal flora of oral cavity known as** .....

a-fungi b-hyphae c- *Actinomyces israelii* d- *Nocardia asteroids*

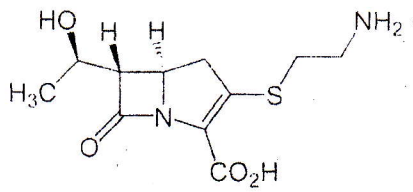
45- **Family streptomycetaceae include** .....

a-*Streptomyces* b- *Streptoacidiphilus* c-*Kitasatospora* d-all of these

46- ***Streptomyces*** **..... Produce Erythromycin**

a- *platensis* *b-endus* *c-erythreus* *d- griseus*

47- **The following chemical structure is** .....



a-aminoglucoside b- tetracycline c-β-Lactam d- macrolides

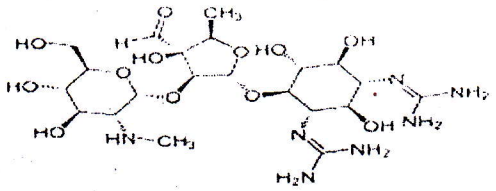
48- **The spores of** ***Streptomyces*** **are called** .....

b- Zoospores b-Arthrospores C- Aleuriospores d-Sporangiospores

49- **Production of antibiotics consider as** ..... **mechanism on plant growth**

a-direct b-indirect c- both direct and indirect d- all the above

50- **The following chemical structure is** .....



a-aminoglucoside b- tetracycline c-β-Lactam d- macrolides

Q2. Choose true or false answer for the following: (30 Marks) Midterm and oral

51- aminoglycosides antibiotics act as bactericidal agents a-True b-False

52- Macrolides antibiotics act as bacteriostatic agents a-True b-False

53- PGPR are small molecules that affect plant growth and development at very high concentrations

a-True b- False

54- Reproductive hyphae called spore-bearing mycelium a-True b- False

55- Aerial hyphae are slender, transparent, and phase-dark a-True b- False

56- *Frankia alni* has plasmids a-True b- False

57- *Frankia alni* can fix nitrogen in the soil and in plant a-True b- False

58- The vesicles of *Frankia* can grow and give hyphae a-True b- False

59- Diazovesicles of *Frankia alni* appear only in N-defficent and symbiotic condition.

a-True b-False

60- Actinobacteria are endospore forming bacteria a-True b-False

61- All Actinobacteria are aerobes a-True b-False

62- All Actinobacteria are slow growing a-True b-False

63- All *streptomyces* spp. are aerobes a-True b-False

64- All sporangiospores in the sporangium of *Frankia* have the same size

a-True b-False

65- Phosphate solubilization by *Streptomyces* occur by secretion of organic acids

a-True b-False

66- Sidrophores function is only for iron acquisition a-True b-False

67- *Streptomyces* spp. produce only antibiotics a-True b-False

68- Actinobacteria prefer alkaline growth condition a-True b-False

69- In actinomycetes only *Frankia* able to fix nitrogen a-True b-False

70- *Streptoacidiphilus* prefer alkaline growth condition a-True b-False

71- *Mycobacterium* spp. are strictly anaerobes a-True b-False

72- The mature spore-bearing hyphae of actinobacteria can not be seen by light microscope

a-True b-False

73- All actinobacteria able to produce melanoid pigments a-True b-False

74- The reproduction in actinobacteria occurs by binary fission a-True b-False

75- Chemotaxnomy is useful in classification and identification of actinobacteria

a-True b-False

76- *Streptomyces* spp. produce about 80% of natural antibiotics a-True b-False

77- *Kitasatospora* spp. have meso-A2 diaminopimelic acids in their cell wall

a-True b-False

78- Some actinobacteria are fast growing a-True b-false

79- *Frankia live* symbiotically with legumes a-True b-False

80- The production of spores start with the formation of sack-like structure

a-True b-False

Best wishes

Prof. Naeima Yousef

امتحان الفصل الدراسي الثاني

للعام الجامعي ٢٠٢٠-٢٠٢١م

القسم الذي يقدم المقرر: قسم الوراثة – كلية الزراعة – جامعة أسيوط

المقرر: (٤٠٢ ز) وراثة العشائر | المستوى: الرابع – كلية العلوم | الشعبة: نبات

لجنة الممتحنين: د/ محمد إبراهيم محمد | د/ أحمد عاطف سلام | الزمن: ساعتين

إطار الإجابة: يجب أن يدون الطالب إجابته في هذه الصفحة فقط ولن يُنظر للإجابة في باقي الصفحات.

إجابة السؤال الأول: ضع علامة (✓) أمام العبارات الصحيحة وعلامة (✗) أمام العبارات الخاطئة: **(٢٥ درجة)**

No.	1	2	3	4	5	6	7	8	9	10	11	12	13
Answer													
No.	14	15	16	17	18	19	20	21	22	23	24	25	
Answer													

إجابة السؤال الثاني: اختيار من متعدد (ضع الحرف الدال على الإجابة الصحيحة): **(١٢ درجة)**

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

إجابة السؤال الثالث: اختيار من متعدد (ضع الحرف الدال على الإجابة الصحيحة): **(٨ درجات)**

No.	1	2	3	4	5	6	7	8
Answer								

إجابة السؤال الرابع: اختيار من متعدد (ضع الحرف الدال على الإجابة الصحيحة): **(٥ درجات)**

No.	1	2	3	4	5
Answer					

إجابة السؤال الخامس (الامتحان الشفوي): اختيار من متعدد (ضع الحرف الدال على الإجابة الصحيحة): **(١٠ درجات)**

No.	1	2	3	4	5	6	7	8	9	10
Answer										

الامتحان مكون من خمسة أسئلة في خمس صفحات **الصفحة الأولى**

أجب عن جميع الأسئلة التالية:

السؤال الاول:- (٢٥ درجة)

ضع علامة (✓) أمام العبارات الصحيحة وعلامة (✗) أمام العبارات الخاطئة (في الجدول المخصص للإجابة):

١- إذا كانت تكرارات الطرز الوراثية بالنسبة لموقع جيني باحدى العشائر AA=0.25 , Aa= 0.50 , aa= 0.25 ، فإن العشيرة متزنة.

٢- في عشيرة إنسانية متزنة إذا كانت نسبة الإناث المصابة بالصلع 0.04 ، فإن نسبة الذكور الطبيعية في هذه العشيرة تساوي 0.20

٣- إذا كان تكرار الأفراد المتنحية aa في إحدى العشائر المتزنة 0.36 ، فإن تكرار الأفراد السائدة الخليطة بالعشيرة يساوي 0.24

٤- إذا كانت التكرارات الأليلية لجين مرتبط بالجنس $P_{(A)}=0.35,\ S_{(a)}=0.15$ ، فإن تكرار الأليل المتنحي عند الاتزان يساوي 0.25

٥- إذا كانت تكرارات الطرز الوراثية باحدى العشائر AA=0.38 , Aa= 0.24 , aa= 0.38 ، فإن طراز التزاوج السائد لا تشابهي.

٦- إذا كان تكرار الطراز الوراثي المتنحي لموقع جيني جسمي بإحدى العشائر المتزنة 0.16 ، فإن تكرار الأليل السائد يساوي 0.84

٧- يؤدي التزاوج التشابهي Assortative mating بين الأفراد المصابين بالصمم deafness إلى نقص نسبة الأفراد المصابة بالعشيرة.

٨- يؤدي التزاوج اللاتشابهي Disassortative mating إلى زيادة نسبة الأفراد الخليطة بالعشيرة عن المتوقع وفقاً للتزاوج العشوائي.

٩- إذا كان 0.19 من رجال عشيرة ما مصابون بالصلع baldness ، فإن نسبة الصلع المتوقعة بين نساء هذه العشيرة تساوي 0.01

١٠- إذا كانت الأعداد المشاهدة بالنسبة لصفة ما في احدى العشائر AA= 320 , Aa= 160 , aa= 20 فإن العشيرة تكون غير متزنة.

١١- يسود اللون الأسود للشعر في الكلاب على الأصفر، إذا كان تكرار الكلاب السوداء 0.84 ، فإن تكرار الأفراد الخليطة يساوي 0.24

١٢- في حالة التربية الداخلية تزيد نسبة الأفراد الأصيلة وتقل نسبة الأفراد الخليطة في العشيرة وتكون قيمة f العشائرية موجبة.

١٣- إذا كان تكرار الأفراد السائدة مظهرياً لصفة ما في إحدى العشائر المتزنة 0.64 ، فإن تكرار الأليل المتنحي بالعشيرة يساوي 0.36

١٤- إذا كانت نسبة الإصابة بمرض عمى الألوان (مرتبط بالجنس) في الذكور 0.02 ، فإن النسبة المتوقعة للإناث المصابة تساوي 0.04

١٥- إذا كانت تكرارات أليلات مجاميع الدم ABO باحدى العشائر r = 0.1 , q = 0.5 , p = 0.4 ، فإن تكرار الطراز O يساوي 0.01

١٦- إذا كانت تكرارات الطرز الوراثية باحدى العشائر AA=0.36 , Aa= 0.48 , aa= 0.16 ، فإن قيمة f العشائرية تساوي صفر

١٧- إذا كانت تكرارات أليلات مجاميع الدم ABO باحدى العشائر r = 0.4 , q = 0.1 , p = 0.5 ، فإن تكرار الطراز AB يساوي 0.4

١٨- إذا كانت تكرارات الطرز الوراثية باحدى العشائر AA=0.33 , Aa= 0.54 , aa= 0.13 ، فإن قيمة f العشائرية تساوي 0.125

١٩- عند اختلاف التكرار الأليلي لموقع مرتبط بالجنس بين الذكور والإناث تصل العشيرة إلى الإتزان بعد جيل واحد من التزاوج العشوائي.

٢٠- لأليل مرتبط بالجنس، لقحت إناث تكراراتها AA= 0.2, Aa= 0.2, aa= 0.6 بذكور متنحية، تكرار A عند الإتزان يساوي 0.2

٢١- تعد الهجرة من القوى التي تؤثر على إتزان العشيرة وهي من أسرع العوامل التي تؤدي إلى تغير التكرار الأليلي في العشيرة.

٢٢- قد يؤدي الإنجراف الوراثي Genetic drift كإحدى القوى التي تؤثر على إتزان العشيرة إلى تثبيت أليلي p or q = 1 .

٢٣- أثر الانتخاب الطبيعي هو بتفضيل صور أليلية معينة تضفي قدرة تكاثرية خاصة على الأفراد الحاملة لها بالمقارنة بالأفراد الأخرى.

٢٤- إذا كان تكرار الأفراد السائدة مظهرياً لصفة ما في إحدى العشائر المتزنة 0.64 ، فإن تكرار الأليل المتنحي بالعشيرة يساوي 0.36

٢٥- إذا كانت تكرارات الأفراد لمجاميع الدم (ABO): A=0.39, B=0.25, AB=0.11, O=0.25، فإن تكرار الأليل I^A يساوي 0.30

أنظر الصفحة التالية ◄

الصفحة الثانية

السؤال الثاني:- (١٢ درجات)

إذا كانت التكرارات الأليلية لاحد الأليلات المرتبطة بالجنس في جيل الآباء كما يلي :

إناث		ذكور	
$p_{(A)}$	$q_{(a)}$	$r_{(A)}$	$s_{(a)}$
0.7	0.3	0.5	0.5

فإن التكرارات الأليلية وتكرارات الطرز الوراثية المتوقعة في الجنسين بعد جيل من التزاوج العشوائي تساوي:

$p_{(A)}$	$q_{(a)}$	AA	Aa	aa	$r_{(A)}$	$s_{(a)}$	q-s
..... (1)	..... (2)	..... (3)	..... (4)	..... (5)	..... (6)	..... (7)	..... (8)

p = ... (9)	q = ... (10)	والتكرارات الأليلية عند الإتزان تساوي:
r = ... (11)	r = ... (12)	

أكمل الجدول باختيار ما يناسب كل فراغ مما يلي: (ضع الحرف الدال على الإجابة في الجدول المخصص):

	A	B	C
(1)	0.60	0.40	0.35
(2)	0.65	0.60	0.40
(3)	0.50	0.35	0.49
(4)	0.25	0.42	0.50
(5)	0.15	0.09	0.35
(6)	0.70	0.60	0.30
(7)	0.30	0.40	0.70
(8)	0.2	0.1	-0.1
(9)	0.50	0.63	0.65
(10)	0.35	0.50	0.37
(11)	0.63	0.70	0.50
(12)	0.50	0.30	0.37

أنظر الصفحة التالية ◄

الصفحة الثالثة

السؤال الثالث:- (٨ درجات)

إذا كانت تكرارات أليلات مجاميع الدم ABO باحدى العشائر:

I^A	I^B	i
p = 0.1	q = 0.5	r = 0.4

فإن تكرارات مجاميع الدم تساوي:

مجاميع الدم	A	B	AB	O
التكرار	..... (1)	..... (2)	..... (3)	..... (4)

وإذا كان حجم العشيرة 1000 فإن الأعداد المتوقعة لمجاميع الدم تساوي:

مجاميع الدم	A	B	AB	O
الأعداد المتوقعة	..... (5)	..... (6)	..... (7)	..... (8)

أكمل الجدول باختيار ما يناسب كل فراغ مما يلي: (ضع الحرف الدال على الإجابة في الجدول المخصص):

	A	B	C
(1)	0.09	0.16	0.25
(2)	0.20	0.65	0.40
(3)	0.25	0.10	0.15
(4)	0.16	0.20	0.09
(5)	160	250	90
(6)	200	400	650
(7)	250	100	150
(8)	90	200	160

أنظر الصفحة التالية ◄

الصفحة الرابعة

السؤال الرابع:- (٥ درجات)

صفة الصلع في الإنسان baldness صفة متأثرة بالجنس يحكمها زوج من الجينات الجسمية، الأليل (B) للصلع يكون سائداً في الذكور ، (b) للشعر الطبيعي سائداً في الإناث، فإذا كانت العشيرة في حالة إتزان وكانت نسبة الإناث الطبيعية (الغير مصابة بالصلع) بالعشيرة تساوي 0.96 ، فإن:

تكرار الأليل المسبب للصلع (B) يساوي ..... (1)

تكرار أليل الشعر الطبيعي (b) يساوي ..... (2)

نسبة الذكور الطبيعية تساوي ..... (3)

نسبة الذكور المصابة تساوي ..... (4)

نسبة الإناث الخليطة تساوي ..... (5)

أكمل الجدول باختيار ما يناسب كل فراغ مما يلي: (ضع الحرف الدال على الإجابة في الجدول المخصص):

	A	B	C
(1)	0.50	0.20	0.30
(2)	0.70	0.50	0.80
(3)	0.64	0.48	0.36
(4)	0.52	0.36	0.64
(5)	0.50	0.48	0.32

أنظر الصفحة التالية ◄

الصفحة الخامسة

السؤال الخامس (الامتحان الشفوي): (١٠ درجات)

في العشيرتين التاليتين إذا كانت تكرارات الطرز الوراثية المختلفة لموقع جيني معين هي:

	AA	Aa	aa
العشيرة الأولى	0.40	0.40	0.20
العشيرة الثانية	0.25	0.50	0.25

فإن التكرارات الأليلية وتكرارات الطرز الوراثية المتوقعة عند الإتزان تساوي:

	$p_{(A)}$	$q_{(a)}$	AA	Aa	aa
العشيرة الأولى	..... (1)	..... (2)	..... (3)	..... (4)	..... (5)
العشيرة الثانية	..... (6)	..... (7)	..... (8)	..... (9)	..... (10)

أكمل الجدول باختيار ما يناسب كل فراغ مما يلي: (ضع الحرف الدال على الإجابة في الجدول المخصص):

	A	B	C
(1)	0.60	0.40	0.50
(2)	0.40	0.50	0.60
(3)	0.16	0.25	0.36
(4)	0.36	0.48	0.24
(5)	0.16	0.10	0.25
(6)	0.36	0.50	0.64
(7)	0.25	0.50	0.75
(8)	0.25	0.36	0.16
(9)	0.40	0.24	0.50
(10)	0.50	0.15	0.25

انتهت الأسئلة مع أطيب التمنيات بالنجاح

لجنة الممتحنين: د/ محمد إبراهيم محمد د/ أحمد عاطف سلام

Assiut University
Faculty of Medicine
Department of Medical Microbiology and Immunology

Date: 19/6/2021
Time: 2 hours
No Pages: 8

كلية معتمدة
بتاريخ 2012/7/12

Immunology Exam for Fourth Year Science Students

Shade the correct answer (1mark x 50)

1- **In secondary lymphoid organs, paracortex contains:**
   a) B cells
   b) B cells and T cells
   c) Plasma cells
   d) T cells

2- **Adhesion molecules can control leucocyte migration by:**
   a) Agglutinating pathogens in the tissues
   b) Binding to ligands on the vascular endothelium
   c) Binding to specific antigen
   d) Changing lymphocyte survival

3- **C3 is able to bind on a microbe that will make it more attractive for phagocytosis. This process is**
   a) Agglutination
   b) Complement activation
   c) Neutralization
   d) Opsonization

4- **Which is an effector cell involved in ADCC of viral infected cells?**
   a) B cells
   b) Helper T cells
   c) Natural killer cells
   d) Regulatory T cells

5- **If a person had a genetic defect affecting perforin production, which cells and immune function would be affected?**
   a) Cytotoxic T cells and natural killer cells/cell killing
   b) Eosinophils and basophils/granule production
   c) Macrophages and neutrophils/phagocytosis
   d) Mast cells/fusion of granules to cell membrane

6- **Which non-specific defence cells specialize in attacking cancer cells and virus-infected cells?**
   a) Cytotoxic T lymphocytes
   b) Helper T lymphocytes
   c) Macrophages
   d) Natural killer cells

7- **A complement component which is strongly chemotactic for neutrophils is:**
   a) C3
   b) C3b
   c) C5a
   d) C5b

8- A protein molecule usually contains multiple:

a) Epitopes
b) Superantigens
c) Carriers
d) Paratopes

9- A substance that can evoke either humoral or cell mediated immunity is termed:

a) Immunogen
b) Hapten
c) Epitope
d) Adjuvant

10- An example of a cytokine produced by activated macrophages with a major role in the innate immune response is:

a) IL-17
b) IL-2
c) IL-4
d) TNFα

11- Antibody-dependent cellular cytotoxicity (ADCC) is the process by which natural killer cells destroy infected cells, identified by what immunoglobulin on the surface?

a) IgA
b) IgE
c) IgG
d) IgM

12- The sequelae associated with exposure to superantigen is due to release of large amount of:

a) Cytokines by T cell
b) Cytokines by B cell
c) Cytokines by macrophage cell
d) Antibodies

13- Cross reacting antibody is demonstrated by antibody binding to:

a) Immunogen
b) An antigen that is structurally similar to the immunogen
c) Hapten
d) Cell surface marker

14- The complement pathway initiated by spontaneous hydrolysis of C3 to generate C3b is termed:

a) Classical pathway
b) Alternative pathway
c) Lectin pathway
d) Immune complex pathway

15- Phagocytes ingest particular matter into cells for degradation. Which of the following is NOT considered a phagocyte?

a) Macrophage
b) Neutrophil
c) Eosinophil
d) Lymphocyte

16- Which of the following key components of the complement pathway can be activated by the lectin, classical, and alternative pathways?

a) C1
b) C3
c) C5
d) C

17- B cell receptors consist of:

a) IgM Only
b) IgD only
c) Both IgM and IgD
d) Both IgM and IgE.

18- The first immunoglobulin class produced in a primary response to an antigen is:

a) IgA
b) IgG
c) IgM
d) IgE

19- The most abundant immunoglobulin class in serum is:

a) IgA
b) IgG
c) IgM
d) IgE

20- Papain can digest the entire IgG into:

a) Two Fab fragment and one Fc fragment.
b) One Fab fragment and one Fc fragment.
c) Two F (ab') 2 fragment and one Fc fragment.
d) One F (ab') 2 fragment and degraded Fc'.

21- The specificity of an antibody is due to:

a) Its valence
b) The heavy chains
c) The Fc portion of the molecule
d) The variable portion of the heavy and light chain

22- The Ig which serves an important effector function at mucous membrane surface is:

a) IgA
b) IgG
c) IgM
d) IgE

23- Monoclonal antibodies recognize a single:

a) Antigen
b) Bacterium
c) Epitope
d) Virus

24- Which of the following is NOT true when comparing primary immune response to subsequent (secondary) immune response?

a) Primary response takes 5-10 days
b) Secondary response takes 1-3 days
c) Primary response has IgM as the major antibody class
d) Primary response has a high affinity for antigen

25- The T cell subset induced in extracellular bacterial & fungal infections is:

a) TH1 cells
b) TH2 cells
c) TH17 cells
d) T cytotoxic cells

26- The CD4 + T cell subset responsible for Immune response against tumors and intracellular infections is:

a) TH1 cells
b) TH2 cells
c) TH17 cells
d) T cytotoxic cells

27- Which of the following immunoglobulin is the most abundant immunoglobulin in newborns?

a) IgA
b) IgM
c) IgG
d) IgD

28-Suppression of Th2 by Th1 cells may be mediated by:

a) IL-2
b) IL-3
c) IL-4
d) IFN γ

29- CD40 Ligand (CD154) is expressed by which of the following?

a) B cells
b) Dendritic cells
c) Resting T cells
d) Activated T cells

30- CD152:

a) Binds to B7 & prevents CD28 costimulation.
b) Is expressed by APCs
c) Provides costimulatory signals to B cells
d) Tranduces the specific signals from TCRs 9-

31- T cell surface receptors for antigen partly recognize:

a) Antibody
b) Cytokines
c) IL-2
d) MHC molecules

32- Proliferation of activated T-cells:

a) Is stimulated by a single specific signal induced by engagement of the T-cell receptor.
b) Is unaffected by anergy.
c) Requires both the specific signal plus costimulation from B7.
d) Requires only binding of costimulation from APC.

33- T-cell CD40L provides a costimulatory signal to:

a) Activated T cells
b) B cells
c) Naïve T cells
d) NK cells

34- The most effective APC for naive T cells in cell-mediated immune response is the:

a) B lymphocyte.
b) Dendritic cell.
c) Macrophage
d) Neutrophil

35- The cytokine produced by the Th1 cells which is most involved in T cell proliferation and differentiation is:

a) IL-1
b) IL-2
c) TGF-β
d) TNFα

36- The cytokine produced by the Th1 cells which is most involved in macrophage activation is:

a) IFN-ɣ
b) IL-2
c) TGF-β
d) TNFα

37- Which of the following components of the adaptive immune system causes lysis of virally infected cells and the release of cytokines?

a) Activated B cell (plasma cell)
b) CD4+ activated T cell
c) CD8+ cytotoxic T cell (CTL)
d) B and C

38- The ____ T cell-APC interaction is MHC ____-restricted, and the ____ T cell-target cell interaction is MHC ____-restricted.

a) CD4+; Class I; CD8+; Class II
b) CD4+; Class II; CD8+; Class I
c) CD8+; Class I; CD4+; Class II
d) CD8+; Class II; CD4+; Class I

39- A Delayed hypersensitivity reaction is characterized by:

a) An infiltrate composed of helper T cells and macrophages
b) An infiltrate composed of neutrophils
c) Edema without a cellular infiltrate
d) An infiltrate composed of eosinophils

40- A positive tuberculin test is an example of:

a) Type I
b) Type II
c) Type III
d) Type IV

41- What is the function of major histocompatibility complex (MHC) molecules?

a) Present sugars to T cells
b) Present peptides to T cells
c) Create holes in the membranes of bacteria
d) Lyse foreign antigens e. Phagocytize foreign antigens

42- Type IV hypersensitivity

a) is mediated through antibody- antigen response

b) typically occurs within few hours after contact with the antigen
c) is initiated by sensitized T cell reacting with the antigen
d) can be passively transferred by serum

43- Tissue injury in cytotoxic hypersensitivity reaction is initiated by

a) Ab interfering with the functioning of biologically active substance
b) Antigen reacting with cell bound Antibody
c) Ab reacting with cell bound Ag
d) Formation of Ag-Ab complex

44- During type I hypersensitivity reaction, the mast cell are

a) destroyed
b) activated
c) degranulated
d) lysed

45- A living microbe with reduced virulence that is used for vaccination is considered:

a) Denaturated
b) Virulent
c) Attenuated
d) toxoid

46- Which of the following is a combined vaccine?

a) Hepatitis B vaccine
b) Hib vaccine
c) Var vaccine
d) DPT vaccine

47- All the given vaccines are attenuated or inactivated whole pathogen except.....

a) Salk
b) Sabin
c) Hepatitis A
d) Tetanus

48- Passively acquired immunity:

a) Involves active generation of antibodies by the individual
b) Does not depend on the type or amount of immunoglobulin
c) Of long duration
d) May be brought about by the administration of preformed antibodies

49- Naturally acquired active immunity would be most likely acquired through which of the following processes?

a) Vaccination
b) Drinking colostrum
c) Natural birth
d) Infection with disease causing organism followed by recovery

50- In passive immunization, immunoglobulins are made:

a) In a laboratory from deactivated viruses and bacteria
b) From the plasma of a person in the acute phase of an infectious disease
c) From the pooled plasma of blood donors
d) From protein produced artificially in a laboratory

Part II: Oral, Midterm and activities Sheet

Shade (T) for true statement and (F) for false statement (30x 1 mark)

51- Human antibodies are classified into five isotypes (IgG, IgA, IgM, IgD and IgE) according to their light polypeptide chains

52- Secretory IgM provides the first line of defense against local infections at the mucosal surfaces

53- In the secondary immune response antibody concentration is very low and it persists for long periods

54- HAT culture medium supports the growth of fused hybrid cells but not single parental cells which die out

55- In the classical complement pathway all components [C1-9] are activated which ends with the production of the membrane attack complex (MAC)

56- The binding of C3b to its receptors on the surface of activated B cells greatly enhances antibody production

57- T cells can only see and respond to antigens associated with MHC molecules on antigen presenting cells

58- Cytokines from TH2 (IL-2, IFNγ) causing proliferation of TC which kill the target cells by perforins & granzymes or Fas-FasL

59- Penicillin, anesthetics and insect venom are common antigens associated with Type I hypersensitivity

60-In Type IV hypersensitivity Activated Th17 secrete Il-17 that recruits neutrophils and induce inflammation

61- Secretory regulatory cells secrete IL-10 and transforming growth factor (TGF)-β

62-Adhesion molecules can control leucocyte migration by Binding to ligands on the vascular endothelium

63-Macrophages cells utilize reactive oxygen species and lysosomal enzymes to kill pathogens

64- Natural killer cell is an effector cell involved in ADCC of viral infected cells

65-Molecules directly involved in NK cell mediated killing include Granzyme A and B

66- A molecule that interacts with MHC outside peptide binding groove is called Super-antigen

67-C3b is a complement component that acts as an opsonin,

68-The membrane attack complex in the complement pathway consists of C3b3b, Bb

69-B cell receptors consist of IgM only

70-The T cell subset induced in extracellular bacterial & fungal infections is T cytotoxic cells

71- T cell receptor is composed of a dimer of alpha (α) and beta (β) chains which is non covalently associated with CD3 complex.

differentiation is IL-1

73- Acquired immunity don't discriminate between self and non self antigen

74- Adjuvants boost the immune response when an Ag has low immunogenicity .

75- NK cells plays a similar role of cytotoxic T (Tc) cells but unlike Tc cells its action is not restricted by MHC.

76- Antibodies that coat infected cells or tumor cells can be recognized by Fc receptors expressed on macrophages

77- Movement of cells toward objects in response to chemical agents called chemotaxins

78- Digestion of engulfed material inside the phagolysosome occurs by Oxygen-independent killing mechanisms only

79- Cilia of the epithelia lining respiratory tract passages remove trapped microbes is a type of the physiological barrier

80- Magic bullet" therapy is done by using monoclonal antibodies to tumour specific antigens alone or after coupling to cytotoxic agents

Assiut University
Faculty of Science, Botany and Microbiology Department
First Term Examination: 2020 – 2021 , Fourth Level : Special Botany
Subject : Secondary Plant Metabolism (B 452).
Time Allowed: 2 hours

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EXAM : 4 PAGES

Q1 : FINAL TERM (50 Marks)

Read carefully and choose the write correct answer on your paper for at least 25 questions.

1- Organic compounds produced by some plants of certain genera and families which are not in manistream of metabolism and appear to have no direct function in growth and development of plants and appear to have no
direct function in growth and developmentof plants are called as,
(a) secondary metabolites (b) secondary plant products
(c) natural products (d) all of above

2. Which of the following are not examples of secondary plant products?
(a) Fats and hemes . (b) Alkaloids
(c) Lignins and tannins (d) Essen ial oils, steroids and rubber

3. Secondary plant products are of great importance in commence in making,
(a) medicinal drugs (b) poisons (insecticides)
(c) flavours and perfumes (d) all of above

4- Which of the following organic compounds are not plant phenolics?
(a) Lignins (b) Tannins (c) Essential oils (d) Flavonoids

5- Which of the following pathway is not involved in secondary carbon metabolism in plants?
(a) Mevalonic acid pathway (b) Pentose phosphate pathway

(c) Malonic acid pathway (d) Shikimic acid pathway

6- The fundamental 5-C unit of terpenoids (i.e., isoprene) has,
(a) branched carbon skeleton (b) unbranched carbon skeleton
(c) ringed carbon skeleton (d) none of the above

7- Sesquiterpene contains,
(a) 10 carbons (b) 15 carbons (c) 20 carbons (d) none of the above

8- Isoprene units are synthesized ill plants from acetyl-CoA through,
(a) malonic acid pathway (b) shikimic acid pathway
(c) mevalonic acid pathway (d) all above

9 - Which of the following statements is not correct?
(a) All organic compounds containing nitrogen and heterocyclic ring are alkaloids
(b) Alkaloids are bitter in taste and soluble in most of organic solvents
(c) Most alkaloids are colourless, crystalline non-volatile solids and are optically active
(d) Many alkaloids exhibit important pharmacological properties.

10 - Which of the following alkaloids does not contain nitrogen in heterocyclic ring?
(a) Narcotine (b) Ephedrine (c) Morphine (d) Quinine

11- In plants, alkaloids usually accumulate in,
(a) young actively growing parts (b) epidermal and hypodermal cells (c) bundle sheaths and latex vessels (d) all of above

12- In tobacco plant, nicotine is synthesized in,
(a) leaves (b) stems (c) roots (d) all of above

13- An alkaloid which is known to inhibit mitotic spindle formation in cells is,
(a) colchicine (b) coniine (c) quinine (d) none of the abvoe

14 - which of the following alkaloids is not synthesized in opium poppy?
(a) Morphine (b) Thebaine (c) Codeine (d) Atropine

15 - An example of indole alkaloids is,
(a) pilocarpine (b) reserpine (c) papaverine (d) all of above

16 - Approximately how many alkaloids have been isolated from plants so far?

(a) 500 (b) 1000 (c) 2000 (d) 3000

17 - Terpenoid containing alkaloids (sterol alkaloids) occur in plants in combination with.

(a) Carbohydrates (b) Proteins c) both (a) and (b) (d) none of the above

18 -Most important function of alkaloids in plants appears to,

(a) act as growth hormone (b) provide protection against predators

(c) to attract animals for pollination (d) none of the above

19 - The basic carbon skeleton of flavonoid is,

(n) C6 – C3 – C6, (b) [C6 – C3 – C6]n (c) [C6 – C3]n (d) c6, - C2 – C6

20 - How are flavonoids synthesized in plants?

(a) By mevalonic acid pathway (b) By malonic acid pathway

(c) By shikimic acid pathway (d) by both (a) and (b)

21 - Which one of the following is not a simple plant phenolic?

(a) Caffeic acid (b) Salicylic acid (c) Abietic acid (d) Ferulic acid

22 - Which of the following is building block of lignins? .

(a) Coniferyl alcohol (b) Sinapyl alcohol

(c) p-Coumaryl alcohol (d) All of above

23 - Primary function of lignin• in plants is,

(a) to provide mechanical support to plant

(b) to provide protection from physical, chemical and biological attack (c) both (a) and (b) (d) none of the above

24- Flavonoids are phenolic compounds that contain,

(a) 15 - C (b) 10 - C (c) 30 - C (d) none of the above

25 -Which of the following is not an important monoterpene component of conifer resins?

(a) Myrcence (b) Menthol (c) a -Pinene (d) Limonene

26 -Essential oils such as peppermint oil produced by nowering plants have,

(a) insects repelling property (b) insects attracting property

(c) insecticidal property (d) none of the above

27 -Monoterpene esters called pyrethroids, which occur in leaves and flowers of Cll1Y-santhemum are used on commercial scale in making,
(a) perfumes (b) medicinal drugs (c) insecticides (d) all of above

28 - Gossypol, which is found in cotton plants and provides resistance to insects, fungal and bacterial pathogens is a,
(a) monoterpene (b) sesquiterpene (c) diterpene.
(d) sesquiterpene dimer Abietic

Q2 : Mid TERM (20 Marks)

Write on :

1- Mevalonic acid pathway of the synthesis of 5-C units of terpencs from acetyl-CoA in plants.
2- Physiological role of akJaloids in plants•

==========

Q3 : ORAL AND ACTIVITY (10 Marks) .

Write On :

Biological Functions of phenolic compounds occur in plants as secondary metabolits

GOOD LUCK **Prof.Dr. M. A. ZIDAN**

Assiut University Faculty of Science Botany & Microbiology Dept.		جامعة أسيوط كلية العلوم قسم النبات والميكروبيولوجى
Microbial Ecology exam (494 B)		Time: 2 hours
(22th June 2021)		4th level students

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

Part I: Final Exam — 50 marks

Q1: Choose the correct answer:

1. **A complex mixture of algae, cyanobacteria, heterotrophic microbes, and detritus that is attached to submerged surfaces in most aquatic ecosystems. They usually present in the shore line zone**
   A. Periphyton B. Benthos
   C. Planktons D. Both A&C
2. **Fungi and fungus-like organisms, which also are significant in nutrient cycling**
   A. Bacterioplankton B. Phytoplankton
   C. Mycoplankton D. Zooplankton
3. **The envelope of enveloped virus particles is usually derived from a host cell membrane by**
   A. Budding B. Fragmentation
   C. Binary fission D. Both A, B
4. **Virus particles consisting of nucleic acid within either a helical or polyhedral core and surrounded by an envelope**
   A. Enveloped virus B. Binal virus
   C. Capsid D. None of them
5. **The causal agents for amebic dysentery, and African sleeping sickness.**
   A. Protozoan infections B. Fungal infections
   C. Bacterial infections D. Viral infections
6. **Sleeping sickness is caused by**
   A. *Trypanosoma brucei* B. *Plasmodium gametocyte*
   C. *Giardia intestinalis* D. Both D&C
7. **Botulism is gastrointestinal food/water borne caused by**
   A. *Vibrio cholera* B. *Salmonella typhi*
   C. *Clostridium botulinum* D. Both D&C
8. **Diarrheal disease is caused by**
   A. *E. coli* B. *Salmonella typhi*
   C. *Giardia intestinalis* D. Both A, B

9. **Physical methods for water treatment includes**
   A. Filtration B. Precipitation
   C. Degradation D. Both A & B
10. **Adsorption technique for water treatment is one of**
   A. Physical methods B. Chemical methods
   C. Biological methods D. Both of them
11. **Microorganisms break decompose dead leaves, twigs and animals, return nutrients to the soil using enzymes.**
   A. Decomposers B. Autotrophs
   C. Biotrophs D. Both A& B
12. **The causal agent for poliomyelitis**
   A. Polio virus B. Rota virus
   C. Hepatitis B D. None of them
13. **Spore formers indicate for old fecal contamination**
   A. *Clostridium perfringens* B. *E. coli*
   C. *Streptococcus* D. Both of A&B
14. **The community of organisms which live on, in, or near the seabed (bottom) and near marine sedimentary environments.**
   A. Periphyton B. Benthos
   C. Planktons D. Epiphytons
15. ***Strepococcus pyrogenes* causes**
   A. Strep throat disease B. Malaria disease
   C. Infantile diarrhea D. None of them
16. **Photoautotroph, chemoautotroph, chemoorganoautotrophs bacteria in water ecosystems, such as heliobacteria; nitrifying bacteria; ferruginous bacteria and sulfuric bacteria are called as**
   A. Allochthonous bacteria B. Autochthonous bacteria
   C. Pathogenic bacteria D. Both of A&B
17. **The viral causal agent for infantile diarrhea**
   A. Polio virus B. Rota virus
   C. Hepatitis B D. Both of A&B
18. **Biological methods for water treatment includes**
   A. Biodegradation B. Biosorption
   C. Filtration D. Both A & B
19. **The viral causal agent for enteric disease with symptoms characterized by diarrhea, vomiting, abdominal discomfort, and fever**
   A. Polio virus B. Rota virus
   C. Hepatitis B D. None of them
20. **Bacterial communities that are considered as foreign communities and are abundant in waters of high fertility.**
   A. Allochthonous bacteria B. Autochthonous bacteria
   C. Pathogenic bacteria D. Both of them
21. **Chronic granulomatous disease is caused by**
   A. *Mycobacterium marinum* B. *Salmonella typhi*
   C. *Clostridium botulinum* D. *Plasmodium gametocyte*

22. **Complex virus particles that have combinations of helical and polyhedral forms.**
A. Enveloped virus B. Binal virus
C. Octahedral virus D. Both of A&B

23. **Cholera is caused by**
A. *Vibrio cholera* B. *Salmonella typhi*
C. *Clostridium botulinum* D. Both of them

24. **Typhoid disease is caused by**
A. *Vibrio cholera* B. *Salmonella typhi*
C. *Clostridium botulinum* D. *Mycobacterium marinum*

25. **Virus multiplication process involves**
A. Adsorption process
B. Penetration process the viral genome
C. Viral Replication, Maturation and Release of the virus particles
D. All of them

26. **Decomposer is important to ecosystems because they:**
A. made up of many overlapping food chains
B. converts heat or light energy into chemical energy
C. gets its energy by eating plants or animals
D. organism that breaks down dead plants and animals into simpler compounds

27. **Bioremediation is:**
A. the use of living organisms or their products to degrade waste into less toxic/non-toxic products.
B. a human made problem.
C. nature's way of cleaning itself.
D. the use of algae or their products to degrade waste into better products

28. **..... is the process by which microorganisms convert organic nitrogen to ammonia.**
A. Ammonification B. Nitrogen fixation
C. Mineralization D. Assimilation

29. **..... method, the pollution is eliminated directly at the place where it occurs, treating the contaminated material at the site.**
A. Chemical B. Physical
C. *In situ* D. *Ex situ*

30. **The rhizoplane is the.....**
A. living part of the biosphere.
B. the root surface including associated soil particles
C. rock and soil part of the lithosphere
D. zone of soil around plant roots

31. **A microbiocenosis is**
A. an association of organisms within a niche.
B. a group of the same species in an area.
C. the organisms found in a particular altitude and latitude.
D. a collection of populations of different species of microorganisms

32. **Two biotic factors that affect an ecosystem are:**

A. temperature and animals B. plants and microganisms

C. water and bacteria D. soil and water

33. **In bioremediation process, microorganisms which are usually a transient member of a community termed as.....**

A. producer B. allochthonous

C. autochthonous D. endophyte

34. ..... **chemically synthesized compounds that have never occurred in nature.**

A. heavy metals B. xenobiotics

C. pollutants D. birds feathers

35. **Factors effecting on bioremediation.....**

A. pollutants B. organisms

C. environment D. all of the above

36. **In .....process, harmful substances convert to a less toxic or non- toxic state.**

A. mineralization B. assimilation

C. biodegradation D. bioremediation

37. **Cation Exchange Capacity increased in .....soil**

A. saline B. acidic

C. basic D. cold

38. ..... **elements are dependent on biogeochemical cycles?**

A. carbon and nitrogen B. sulphur and phosphorus.

C. iron and zenic D. both A&B

39. **Breaking down of nitrates into atmospheric nitrogen**

A. ammonification B. denitrafication

C. nitrogen fixation D. mineralization

40. **Which of the following is capable of oxidizing sulfur to sulfates?**

A. *Thiobacillus thiooxidans* B. *Desulfotomaculum*

C. *Bacillus* D. *Streptomyces*

41. **Which of the following microorganism use H_2S as the electron donor to reduce carbon dioxide?**

A. sulphate-reducing bacteria B. purple photosynthetic bacteria

C. aerobic bacteria D. endophytic bacteria

42. **The population of algae in soil is ..... that of either bacteria or fungi.**

A. generally smaller than B. generally greater than

C. equal to D. none of these

43. **The microbial ecosystem of soil includes**

A. biotic components of soil B. abiotic components of soil

C. A&B D. None of the above

44. **Which of the following fungi on infecting crop roots can improve their uptake of phosphorus and other nutrients?**

A. *Saccharomyces cerevisiae* B. mycorrhiza

C. *Candida torulopsis* D. *Aspergillus niger*

45. **Which of the following is not considered soil "fauna?"**

A. a nematode
B. a mite
C. an earthworm
D. an oak tree root

46. **Autotrophs are defined as organisms that .....**

A. can live without oxygen
B. do not need to consume any organic carbon
C. require oxygen to live
D. ingest and consume other live organisms

47. **Bacteria, as a group, are responsible for .....**

A. denitrafication
B. sulfur oxidation
C. nitrogen fixation
D. all of the above

48. **A soup container was forgotten in the refrigerator and shows contamination. The contaminants are probably which of the following?**

A. thermophiles
B. acidophiles
C. mesophiles
D. psychrotrophs

49. **Bacteria isolated from a hot tub at 39 °C are probably which of the following?**

A. Thermophiles
B. psychrotrophs
C. mesophiles
D. hyperthermophiles

50. **The five main factors of soil formation are**

A. parent material, climate, time, biology, and topography
B. horizons, profiles, humus, texture, and permeability
C. pH, color, texture, porosity, and water holding capacity
D. pH, time, climate, biology, and permeability

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

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

51. *Plasmodium gametocyte* protozoa cause malaria disease.
52. Allochthonous are abundant in polluted water such as sulphur purple green bacteria.
53. Coliforms refer to the various genera of the family Enterobacteriaceae.
54. Viruses are extracellular obligate parasites.
55. Chronic granulomatous disease is localized in skin, frequently occurred with aquarium keepers.
56. Vaccination aims to induce a strong T-cell and B-cell response against viruses by using killed or attenuated virus particles.
57. Most of coliforms are present as normal flora of humans and/or animals and are considered as opportunistic pathogens.
58. Many organisms adapted to deep-water pressure cannot survive in the upper parts of the water column.
59. Oligotrophic water trophicity is characterized by high nutrient concentrations and high microbial richness.
60. The periphyton is an important indicator of water quality that showed responses for the toxic pollutants.
61. Phytoplanktons are autotrophic, prokaryotic or eukaryotic algae that live near the water surface.
62. Virions are unable to make copies of them and they must infect a living host cell in order to make more copies of themselves.
63. *Giardia intestinalis* causes diarrhea.
64. Typhoid *disease* causes a severe diarrhea (white rice); Loss of 20 L/day; vomiting and muscle cramps.
65. Coliforms are facultative anaerobe, Gram negative, non-spore forming, rod shaped, produce gas and acid within 48 h at 35 °C and ferment lactose.

66. Lignin is the most substance easy to decompose among the plant materials.

67. Atmospheric CO_2 is fixed into organic compounds by plants, together with photoautotrophic and chemoautotrophic microorganisms.

68. Decomposition of cellulose occurs slowly in soils of basic pH.

69. Competition of nutrient by microorganism is considered one of indirect mechanisms of biofertilizer.

70. Oxygen concentration and organic nutrient content decrease with the depth soil increase.

71. In worm areas, the release of nutrients into the soil is slower than cooler areas.

72. In assimilatory sulphate reduction, plants convert sulfate into sulfur containing amino acid.

73. Precipitation of P in soil is generally independent on soil pH.

74. Air is a carrier medium in which organism cannot grow.

75. Hydrosphere is the land portion of the earth.

76. Carbon cycling is not restricted in freshwater marshlands.

77. The phosphorus cycle cycles through only rocks and oceans.

78. Microbes can be found as only a decomposer on an energy pyramid.

79. The major mechanism of mineral phosphate solubilization is the action of organic acids synthesized by soil microorganisms.

80. Phosphorus in soil is available to plants in a form monobasic and dibasic phosphate.

Good Luck

Dr. Elhagag Ahmed Hassan

Dr. Shymaa Rehan

Faculty of Science Botany& Microbiology Department		كلية العلوم قسم النبات والميكروبيولوجي
Food Microbiology (498 B) Time: Two hours Total degree: 80 marks		Second semester exam - the academic year 2020/2021 Fourth Level Exam date: Tuesday, 29/06/2021

Answer all the following questions:

Question 1: Choose the correct answer from the following:(25 marks)

1. **Spoiled food considered unsafe because high numbers of spoilage organisms indicate foodborne pathogen may be present.**
   a. True b. False
2. **In thermophilic microbes, species grow between 40 and 90°C, with optimum growth at 55 to 65°C.**
   a. True b. False
3. **During food poisoning Symptoms generally occur quickly, as early as 30 min after ingestion.**
   a. True b. False
4. **Enterotoxigenic strains of *Staph. aureus* produce seven different enterotoxins: A, B, C1, C2, C3, D, and E.**
   a. True b. False
5. **Growth of organism or production of toxin may not result in changes in taste or appearance of food.**
   a. True b. False
6. **Canning process designed to destroy endospores.**
   a. True b. False
7. **Ground meats are troublesome source of foodborne infection.**
   a. True b. False
8. **Preservation of food by inhibition methods does not necessarily imply the destruction of organisms.**
   a. True b. False
9. **Dry cure in which the meat or fish is rubbed with salt.**
   a. **True** b. **False**
10. **Perishable foods are foods that decay quickly.**
    a. True b. False
11. **Bacteria don't grow at room temperature.**
    a. True b. False
12. ***Staphylococcus aureus* is commonly linked with ground beef.**
    a. True b. False
13. **At refrigeration temperatures, most microorganisms can grow/reproduce, but at a much slower rate than at room temperature.**
    a. True b. False
14. **Symptoms of *Salmonella* poisoning include respiratory failure.**
    a. True b. False
15. **You can usually tell from a food's taste, odor, or appearance if that food poses a risk for food-borne illness.**
    a. True b. False
16. **Hepatitis A can cause liver damage.**
    a. True b. False
17. **Separate cooking boards should be used for cutting raw meat, poultry, fish vs raw vegetables and fruits.**

a. True b. False

18. Freezing kills microorganisms.

a. True b. False

19. Food irradiation to preserve foods is dangerous and outlawed by the government.

a. True b. False

20. Most people will not experience a food-borne illness in their lifetime.

a. True b. False

21. Bacteria grows with food and moisture over time and some need oxygen.

a. True
b. False

22. If you have a cut on your hand, you should wear a glove while cooking.

a. True
b. False

23. Does reducing the pH of food lower the chances of food spoiling?

a. True
b. False

24. Microbes cause food to spoil.

a. True
b. False

25. Food preservation improves on the shelf life of products.

a. True
b. False

Question 2: Put true or false in front of each sentence of the following and shadow it in the answer sheet **(25 degree, one for each)**

26	Bacteria are important pathogens in food as they can grow in low pH, low water activity and high osmotic pressure ( )
27	*Fusarium* sp. associated with rot in citrus fruits, potatoes, and grains ( )
28	*Rhodotorula* sp. are pigment forming yeasts that cause discoloration of meat and fish ( )
29	Aciduric bacteria like *Lactobacillus,* and *Streptococcus* sp. are able to survive at pH <9.0 ( )
30	Acetic acid bacteria produce large quantities of lactic acid from carbohydrates ( )
31	Gas-producing bacteria can grow at a relatively high osmotic environment ( )
32	Enteric pathogens including *Salmonella* sp., *Shigella* sp., and *Vibrio* sp. can cause human gastrointestinal infection ( )
33	Fecal coliforms like *Bacillus* sp. used as an index of sanitation ( )
34	*Zygosaccharomyces* sp. cause spoilage of high acid foods like ketchups, and mayonnaise ( )
35	Butyric acid bacteria as *Clostridium butyricum* produce butyric acid in large amounts ( )
36	Plants produce natural antimicrobial metabolites can increase the presence of micro bes ( )
37	Chlorine-treated potable water shouldn't be used in processing, washing, sanitation, and as an ingredient ( )
38	Water quality, feeding habits, and diseases can change the normal microbial types of fish ( )
39	*Salmonella* sp., *Listeria* sp., *E. coli, Clostridium* sp., *Bacillus* sp., yeasts and molds can get in food from equipment ( )
40	Ground meat can have 100-1000 microorganisms/gram ( )
41	Fin-fish and crustaceans can have 100–1000 million bacterial cells/g ( )
42	Factors influencing on food microbiology are nutrients, inhibitors or anti-microbials, water activity, pH and oxidation–reduction potential ( )
43	Free water in a food is not necessary for the microbial growth ( )
44	The pH range of molds growth is 1.5 to 9.0, while Gram-positive bacteria is 4.0 to 8.5 ( )

45	Fresh foods of plant and animal origin are in oxidized state because of the presence of reducing sugars, and –SH group of proteins ( )
46	*Streptococcus thermophiles* has been implicated in cheeses ripening; and flavor ( )
47	*Acetobacter aceti* is used to produce acetic acid from alcohol as obligate anaerobes ( )
48	*Saccharomyces cerevisiae* used to leaven bread and produce alcohol ( )
49	*Aspergillus niger* is used to produce citric acid and gluconic acid from sucrose ( )
50	*Penicillium camembertii* is used in Camembert cheese and *P. caseicolum* is used in Brie cheese ( )

Mid-term, activity, and oral exam

Question 3: Choose the correct answer from the following (15 marks)

51. What is common food borne illness that is identified coming from under cooked poultry?
a. *Nitrospira* b. *Salmonella* c. *Aquificae*

52. A _____ is an illness transported to people by food.
a. Foodborne Illness b. Contamination c. Pathogen

53. The deterioration in the color, flavor, odor, or consistency of a food product is
a. Food contamination b. Food poisoning c. Food spoilage

54. What is the best way to thaw out frozen foods?
a. Warm Water b. Refrigerator c. On Counter

55. In what temperatures does bacteria grow?
a. 15-35 b. 0-4 c. 20-60

56. A type of food preservation technique that involves sealing food in sterilized, airtight containers:
a. Drying b. Canning c. Freezing

57. The most common symptom of food-borne illness is:
a. kidney failure b. diarrhea c. skin rash

58. Increasing the acid content of a food is effective in preventing the growth of:
a. *Clostridium botulinum* b. *Salmonella* c. molds

59. The food-borne illness that caused by a foodservice worker coughing or sneezing on food is:
a. *Staphylococcus aureus* b. *Clostridium perfringens* c. *Salmonella*

60. What should food handlers do to prevent food allergens from being transferred to food?
a. Clean and sanitize utensils after use.
b. Buy from approved, reputable suppliers.
c. Store cold food at 41°F (5°C) or lower.

61. Bacteria grow best in foods that have a pH range of
a. 2.5 - 4.6 b. 4.6 - 7.5 c. 7 - 8.2

62. Which of the following bacteria does not need oxygen to survive and grow?
a. *Salmonella* spp. b. *Listeria monocytogenes* c. *Clostridum botulinum*

63. What are the most common symptoms of food poisoning?
a. Nausea and vomiting b. Joint pain c. Headache

64. How does jam making destroy microorganisms?
a. Freezing and bottling b. Sugaring and bottling c. Salting and heating

65. Exclusion of _____ inhibits the growth of bacteria.
a. Chemicals b. air c. yeast

Question 4: Choose the correct answer and shadow it in the answer sheet.

(15 degrees, one for each)

66	..... bacteria hydrolyze proteins because they produce extracellular proteinases			
	A. Proteolytic	B. Lipolytic	C. Saccharolytic	D. Not from previous
67	..... bacteria are able to survive in pasteurization temperature			
	A. Thermophilic	B. Psychrotrophic	C. Thermoduric	D. A and C
68	..... bacteria cannot grow in the presence of oxygen like *Clostridium* sp.			
	A. Aerobic	B. Anaerobic	C. Micro-aerobic	D. B and C
69	Normally, raw milk contains ..... microorganisms/ml			
	A. 3000	B. 50000	C. 8000	D. <1000
70	Grade A pasteurized milk can have standard plate counts of 20,000/ml and ..... coliforms/ml			
	A. 50	B. 100	C. ≤10	D. 1000
71	Egg shellcan have ..... million bacteria, however pasteurization can reduce the numbers to 1000/ml.			
	A. 2	B. 5	C. 10	D. 20
72	Bottled water should not contain more than ..... bacteria and >10 coliforms/100 ml			
	A. 10 to 100	B. 100 to 1000	C. 1000 to 10000	D. Not from previous
73	Natural inhibitors like ..... are found in egg, milk, and cloves			
	A. Lysozyme	B. Agglutinin	C. Eugenol	D. All previous
74	The Aw of food ranges from ..... ca.			
	A. 0.1-0.99	B. 11-19	C. 50-100	D. 200-400
75	Few foods like clams and egg albumen have pH			
	A. >7	B. <7	C. 9	D. 11
76	Microorganisms with optimum growth at 35°C called			
	A. Thermophiles	B. Mesophiles	C. Psychrophiles	D. Thermotolerant
77	.....capable of hydrolyzing lactose, casein, and ferment galactose, sucrose and maltose.			
	A. S. thermophilus	*B. A. aceti*	*C. Bifidobacterium sp.*	*D. Lactococcus lactic*
78	.....can ferment glucose to lactic and acetic acids without producing CO_2.			
	A. S. thermophilus	*B. A. aceti*	*C. Bifidobacterium sp.*	*D. Lactococcus lactic*
79	.....can hydrolyze lactose and produce ethanol and β-galactosidase (lactase)			
	A. Kluyveromyces marxianus	*B. Candida utilis*	*C. Penicillium camembertii*	*D. Aspergillus niger*
80	.....is used for ripening of Roquefort, and blue cheeses			
	A. Penicillium camembertii	*B. Penicillium roquefortii*	*C. Aspergillus niger*	*D. Aspergillus flavus*

Good luck

Dr. Amal danial, Dr. Ghada Abd-Elmonsef

Assiut University **Faculty of Science** **Botany & Microbiology Department**		**Second Semester: July 2021** **The time allowed: 2 hours.** **Total marks: 50 +30 Marks** **Course: Symbiosis Microbiology (496B)**

Answer the following questions: Q1 (Final) and Q2 (Midterm + Oral + Activity)

Part I: Final Exam: Q1: Choose the correct answer A, B or C (50 marks)

1. The development of hyphae between root cells in ectomycorrhizae to form a complex highly branched structure called.....
   Ⓐ **Hartig net** Ⓑ **Arbuscules** Ⓒ **Mantel**
2. A myco-heterotroph is the ....partner in symbiotic relationship.
   Ⓐ **Fungi** Ⓑ **Kind of cheating** Ⓒ **Parasitic plant**
3. Plants colonized with ericoid mycorrhiza are often perennial shrubs or small trees with.....
   Ⓐ **Green leaves** Ⓑ **Terminal buds** Ⓒ **Sclerophylls' leaves**
4. Endomycorrhiza are included .....
   Ⓐ **Arbutoid** Ⓑ **Ericoid** Ⓒ **Ectendomycorrhiza**
5. Trehalose, a fungal sugar of orchid mycorrhize, is translocated to..... where it is metabolized into other carbohydrates.
   Ⓐ **Protocorm** Ⓑ **Mantel** Ⓒ **Hyphae**
6. Asexual reproduction in lichen as a small outgrowth of the thallus is called.....
   Ⓐ **Isidia** Ⓑ **Soredia** Ⓒ **Perithecium**
7. ..... known to occur between roots of adjacent plants, can act as a mechanism for the transfer of nutrients between hosts.
   Ⓐ **Hyphal bridges** Ⓑ **Intraradical hyphae** Ⓒ **Outer cortex**
8. The genus ..... do not form intraradical vesicles.
   Ⓐ ***Gigaspora*** Ⓑ ***Scutellospora*** Ⓒ **Both A and B**
9. The mass of cells that are produced when orchid seed germinates.
   Ⓐ **Protocorm** Ⓑ **Pelotons** Ⓒ **Hyphal coils**
10. Commensalism is a relationship between two organisms where one organism.....
    Ⓐ **Unaffected** Ⓑ **Harmed** Ⓒ **Mutually**
11. .....fungi can be characterized by presence of a thin mantle and intracellular penetration into root cortical cells.
    Ⓐ **Orchids** Ⓑ **Ectomycorrhizal** Ⓒ **Ectendomycorrhizal**
12. The intraradical hyphae of AM fungi are surrounded by the .....
    Ⓐ **Trehalose** Ⓑ **Nutrients** Ⓒ **Host plasma membrane**
13. Reproductive hyphae develop the ..... after colonization of roots.
    Ⓐ **Entry points** Ⓑ **Arbuscules** Ⓒ **Fertile spores**
14. Root of ericoid mycorrhiza consists of vascular cylinder and.....
    Ⓐ **Cortical cells** Ⓑ **Enlarged epidermal layer** Ⓒ **Both A and B**

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15. Intraradical hyphae persist in decaying root in the soil are important sources of.....

Ⓐ **Nutrients** Ⓑ **Phosphorus** Ⓒ **Inoculum**

16. Fungi colonizing plants in the Montropaceae family .....the plant cell walls.

Ⓐ **Never penetrate** Ⓑ **Colonize** Ⓒ **Degrade**

17. The internal structure of fruticose lichen is composed of .....,medulla and a hollow center or a dense central cord.

Ⓐ **Dense outer cortex** Ⓑ **The algal layer** Ⓒ **Both A and B**

18. The hyphae of Hartig net are.....

Ⓐ**Multinucleate & coenocytic** Ⓑ **Uninucleate & coenocytic** Ⓒ **Septate & multinucleate**

19. Ericoid mycorrhizal fungi can protect their hosts from .....

Ⓐ **Heavy metals** Ⓑ **Nutrients** Ⓒ **Plant diseases**

20. The fungi that form arbutoid mycorrhizal relationships are.....

Ⓐ **Ascomycetes** Ⓑ **Basidiomycetes** Ⓒ **Saprotrophic**

21. Obligate mycorrhizal plants are ..... dependent on mycorrhizal fungi for their phosphorus nutrition.

Ⓐ **Never** Ⓑ **More** Ⓒ **Solely**

22. Foliose lichen is characterized by ..... thalli, and an upper and lower cortex.

Ⓐ **Rhizines** Ⓑ **Shrubby** Ⓒ **Leafy**

23. Ericoid mycorrhizas are found growing on nutrient.....

Ⓐ **Poor soils** Ⓑ **Saline soils** Ⓒ **Heavy metal polluted soils**

24. ..... lichen is with edges flat, unlobed, growing tight against the substrate.

Ⓐ **Crustose** Ⓑ **Foliose** Ⓒ **Fruticose**

25. ..... run towards and along root surfaces establishing new entry points.

Ⓐ **Infective hyphae** Ⓑ **Extraradical hyphae** Ⓒ **Reproductive hyphae**

26. ..... activate specific regulatory protein (*Nod D*) of certain rhizobia present in the soil which cultivated with specific legume.

Ⓐ **Flavonoids** Ⓑ **Nod factor** Ⓒ **Nodulins**

27. How many molecules of ATP are required to fix one molecules of nitrogen?

Ⓐ **20** Ⓑ **6** Ⓒ **16**

28. Which protein contains in nitrogenase enzyme complex?

Ⓐ **Fe-Fe** Ⓑ **Fe Protein** Ⓒ **Fe & Mo-Fe protein**

29. *Gunnera* possesses unique qualities that allow it to attract specialized ..... to provide the plant with fixed nitrogen.

Ⓐ **Actinomycetes** Ⓑ **Cyanobacteria** Ⓒ **Rhizobia**

30. ..... released by Legume roots and consider signal to rhizobia in the soil that a Legume is present and ready to nodulate.

Ⓐ **Flavonoids** Ⓑ **Nod factor** Ⓒ **Nodulins**

31. *Rhizobium* root nodules in legume plants .....

Ⓐ **Nitrify N_2 from the air** Ⓑ **Fix N_2 from the air** Ⓒ **Fix ammonia from the air**

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32. The ability to cause crown gall disease is associated with the presence of ..... within the bacterial cell.

Ⓐ **Plasmid** Ⓑ **Replication sites** Ⓒ **Polymerase**

33. *Agrobacterium tumefaciens* can use only..... as unique carbon/nitrogen source.

Ⓐ **Cytokinins** Ⓑ **Endonuclease** Ⓒ **Opines**

34. .....produced in plant wound sites and activate the virulence genes of *Agrobacterium tumefaciens.*

Ⓐ **Acetosyringone** Ⓑ **Flavonoids** Ⓒ **T-DNA**

35. *Buchnera aphidicola* is located in specialised insect cells called.....

Ⓐ **Nodules** Ⓑ **Bacteriocytes** Ⓒ **Vesicles**

36. *Buchnera aphidicola* an endosymbiont of the pea aphid is.....

Ⓐ **Transmitted maternally** Ⓑ **Transmitted horizontally** Ⓒ **Neither A nor B**

37. *Riftia pachyptila* tubeworm is a house of a dense population of intracellular .....

Ⓐ ***Agrobacterium tumefaciens*** Ⓑ ***Vibrio fischeri*** Ⓒ **Sulfide-oxidizing bacteria**

38. N-acylhomoserine lactone accumulates as bacterial population densities increase, leading to the binding and activation of .....

Ⓐ ***LuxI*** Ⓑ ***LuxR*** Ⓒ **Luciferase genes**

39. N-acylhomoserine lactone produced by *Vibrio fischeri* as a small-signaling molecule termed...

Ⓐ **An autoinducer** Ⓑ **Nod factor** Ⓒ ***Nod* genes**

40. A free-living nitrogen fixing bacterium is .....

Ⓐ ***Clostridium*** Ⓑ ***Azotobacter*** Ⓒ **Both A and B**

41. Heterocyst contains enzyme.....

Ⓐ **Cellulase** Ⓑ **Nitrogenase** Ⓒ **Phosphorylase**

42. Leghemoglobin is coded by .....

Ⓐ **Only bacteria** Ⓑ **Only plant** Ⓒ **Bacteria and plant**

43. Leghemoglobin takes part in .....

Ⓐ **Energy release** Ⓑ **Protecting nitrogenase** Ⓒ **N_2 absorption**

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44. .....is aquatic fern which is an excellent biofertilizer.

Ⓐ ***Rhizobium*** Ⓑ ***Azolla*** Ⓒ ***Marsilea***

45.....is nitrogen fixing blue green algae.

Ⓐ ***Spirogyra*** Ⓑ ***Rhizobium*** Ⓒ ***Anabaena***

46. In the process of nitrogen fixation, which of the following microorganism is involved?

Ⓐ Non symbiotic microorganisms only

Ⓑ Symbiotic microorganisms only

Ⓒ Both A and B

47. If wheat field is inoculated with *Rhizobium,* .....

Ⓐ Soil will become nitrogen rich

Ⓑ Soil will become rich in calcium

Ⓒ No effect on soil nitrogen

48. What kind of interactions takes place in the nodules of plant roots?

Ⓐ Enhanced phosphorus uptake

Ⓑ Enhanced water uptake

Ⓒ Nitrogen fixation

49. Why would *Vibrio Fischeri* only activate its bioluminescence after a specific amount of cells being present?

Ⓐ They use the released hormones to check how many bacteria are present

Ⓑ They react the death of bacteria causing a chain reaction

Ⓒ The latest cell that has gone through mitosis announces how many cells there are

50.The groups of symbiotic bacteria, which have the ability to fix nitrogen.

Ⓐ Derive their food and minerals from the legume, and in turn they supply the legume with some or all of its nitrogen

Ⓑ Grow together for a mutual benefit is called symbiosis and so these bacteria are called symbiotic nitrogen-fixing bacteria

Ⓒ Both A and B

انظر خلفه

Part II: Exam of Midterm + Oral + Activity

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

51. Extraradical fungal hyphae may initiate intracellular or intercellular vesicles.
52. In *Arum-type* AM arbuscules, thick coiled hyphae spread intracellularly.
53. Vesicles can develop from the end of fungal hyphae or from lateral branches.
54. The bulk of the lichen's body is formed from filaments of the algal partner.
55. The symbiotic stage in mycorrhiza life cycle refers to the penetration and development of arbuscules in the cortex of roots.
56. For identification of the fungal component of ectomycorrhizae, mantle colour and surface features such as whether the mantle is smooth, warty, cottony or spiny are used.
57. Appressorium is fungal hyphal tip enlargement that attaches to the soil particles.
58. The asymbiotic stage is referred to as the resting stage of the AM fungal cycle.
59. Monotropoid mycorrhizae have limited intracellular penetration of which achieved by the development of fungal pegs and each peg forms from an inner mantle hypha.
60. Arbutoid mycorrhizas have a mantle, and intracellular hyphae forming Hartig net.
61. Vesicle formation usually follows that of arbuscules, indicating that the fungus may require arbuscular-derived sugars from the host prior to their formation.
62. Orchid mycorrhizas are mutualistic symbioses and there is no evidence, to date, that the fungus benefits from the association.
63. Extraradical absorptive hyphae are colonized the rhizosphere in search of nutrients.
64. Foliose lichen is characterized by flattened leafy thalli, and an upper and lower cortex.
65. Arbuscular mycorrhizas were formerly classified in the phylum Zygomycota under the family Endogonaceae.
66. *Bradyrhizobium* spp. whose nodulation functions (*nif, fix*) are encoded on their chromosome.
67. Commensal bacteria can cause diseases for their host.
68. Leghemoglobin can fix atmospheric nitrogen in root nodules of plant.
69. The function of the bacterial endosymbionts in the trophosome of giant tube worms is to produce oxygen.
70. Crown galls disease is a result of transfer of all genomic DNA of parasite to plant.
71. Rhizobia are actively fixing nitrogen when the interior color of the nodules is white.
72. Herbivores produce cellulose-digesting enzymes and can digest by their self all food they eat.

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73. High acidity of stomach allows a high number of bacteria to live inside it.
74. Skin microflora can directly protect the host from pathogenic bacteria by bacteriocin production.
75. The application of chemical N fertilizer is more preferable than biological nitrogen fixation to increase soil fertility.
76. Actinorhizal plants are able to form a symbiosis with cyanobacteria.
77. Actinorhizal nodules have a wide range of colors.
78. Large nodules of actinorhizal plants generally have active and inactive nitrogen-fixing tissue.
79. Actinorhizal nodules are deep and difficult to find in rocky soil.
80. In indeterminate nodules, meristematic activity is not persistent.

With My Best Wishes

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