

Selfish

Choose the Correct Answer for the following questions.

(Each question worth one point)

- 1- Reductive TCA cycle, the acetyl-CoA pathway and Calvin cycle are of the major in prokaryotes
 - a- CO₂ fixation pathways
 - b- respiration pathways
 - c- None of the above

- 2- is strictly chemolithoautotrophic.
 - a- *Aquifex pyrophilus*
 - b- *Escherichia coli*
 - c- Cyanobacteria

- 3- breaks down a polymer chain to its monomers
 - a- Hydrolysis
 - b- Dehydration reactions
 - c- None of the above

- 4- Which of the following do not inherently have their own metabolism?
 - a- Bacteria
 - b- Viruses
 - c- Fungi

- 5- Photosynthesis is
 - a- an oxidation process
 - b- a reduction process
 - c- a redox (oxidation-reduction) process

- 6- One of the key enzymes in the reductive TCA cycle is which cleaves citrate (6 carbons) into oxaloacetate (4 carbons) and acetyl CoA (2 carbons).
 - a- ATP citrate lyase
 - b- isocitrate dehydrogenase
 - c- oxoglutarate:ferredoxin oxidoreductase

- 7- are a group of hyperthermophilic hydrogen-oxidizing bacteria that live in harsh environmental settings and are found near underwater volcanoes or hot springs and can grow on hydrogen
- a- Cyanobacteria
 - b- Aquificota
 - c- Purple non-sulfur bacteria
- 8- carbon fixation is done using the reductive TCA cycle and forms acetyl-CoA as well as many other bio-synthetic materials.
- a- *Nostoc* sp.
 - b- *Chlamydomonas* sp.
 - c- *Aquifex* sp.
- 9- is composed of adenine (a nitrogenous base), ribose (a five-carbon sugar) and three phosphate groups.
- a- NADPH
 - b- NADH
 - c- ATP
- 10- In eubacteria, ATP synthase lies across the
- a- plasma membrane
 - b- inner mitochondrial membrane
 - c- nuclear membrane
- 11- is the initial electrons donor in light reactions during oxygenic photosynthesis.
- a- NADPH
 - b- Water
 - c- ATP
- 12- do not have chloroplasts where thylakoid membranes are located in the cytoplasm.
- a- Higher plants
 - b- Green algae
 - c- Cyanobacteria

- 13- molecules that split during oxygenic photosynthesis are re-produced through aerobic respiration by all aerobic respiratory organisms including oxygenic photosynthetic ones.
- a- Oxygen
 - b- Glucose
 - c- Water
- 14- do not produce oxygen during photosynthesis.
- a- Cyanobacteria
 - b- Green algae
 - c- Photosynthetic eubacteria
- 15- make their own food by using light
- a- Photoautotrophs
 - b- Chemoautotrophs
 - c- Heterotrophs
- 16- Instead of breaking down acetyl CoA with the release of 2 CO₂ and the generation of energy, acetyl CoA is synthesized by the incorporation of 2 CO₂ and the input of 8 H⁺ (in the form of NADH and/or FADH), and 2 ATP during
- a- reverse TCA cycle
 - b- Calvin cycle
 - c- TCA cycle
- 17- Eukaryotic organisms capable of photosynthesis have ATP synthase across the.....
- a- thylakoid membranes
 - b- inner mitochondrial membrane
 - c- All of the above
- 18- During photosynthesis process, ATP and NADPH produced during light reactions are consumed in for carbon fixation.
- a- Calvin cycle
 - b- Krebs cycle
 - c- glycolysis

- 19- Series of chemical reactions within the cell that break down a complex molecule are called
- a- metabolism
 - b- catabolism
 - c- anabolism
- 20- is the energy currency of cells.
- a- ATP
 - b- Ferredoxin
 - c- Glycogen
- 21- In comparison, which of the following is the highest energy rich compound ?
- a- ATP
 - b- NADH
 - c- Glucose
- 22- is the immediate source of energy that powers most forms of cellular work.
- a- Starch
 - b- Glycogen
 - c- ATP
- 23- are the energy-converting organelles found in eukaryotes including eukaryotic microorganisms.
- a- Mitochondria
 - b- Chloroplasts
 - c- All of the above
- 24- CO_2 is to sugar during photosynthesis.
- a- oxidized
 - b- reduced
 - c- hydrolyzed
- 25- In cyanobacteria, glucose is synthesized in the during photosynthesis.
- a- stroma
 - b- cytoplasm
 - c- mitochondrial matrix

- 26- Which one of the following has a role in Phosphorylation of Glucose?
- a) **Enolase enzyme**
 - b) **Aldolase enzyme**
 - c) **Glucokinase enzyme**
 - d) **Phosphohexose isomerase Enzyme**
- 27- Which one of the following has a role in Oxidation of Glyceraldehyde 3-Phosphate during glycolysis?
- a) **Glyceraldehyde 3-Phosphate kinase enzyme**
 - b) **Glyceraldehyde 3-Phosphate dehydrogenase enzyme**
 - c) **Glyceraldehyde 3-Phosphate isomerase enzyme**
 - d) **Glyceraldehyde 3-Phosphate mutase enzyme**
- 28- Which one of the following has a role in Cleavage of Fructose 1,6-Bisphosphate during glycolysis?
- a) **Aldolase enzyme**
 - b) **Isomerase enzyme**
 - c) **Kinase enzyme**
 - d) **Enolase enzyme**
- 29- Which one of the following has a role in Conversion of Glucose 6-Phosphate to Fructose 6-Phosphate during glycolysis?
- a) **Triose phosphate isomerase enzyme**
 - b) **Phosphohexose isomerase enzyme**
 - c) **Phosphofructose kinase enzyme**
 - d) **Phosphoglycerate mutase enzyme**
- 30- Which one of the following uses to save reducing potential during Phosphogluconate pathway?
- a) **FADH**
 - b) **NADPH**
 - c) **NADH**
 - d) **FADPH**
- 31- Which one of the following has a role in dehydration of 2-phosphoglycerate during glycolysis?
- a) **Hexokinase enzyme**
 - b) **Aldolase enzyme**
 - c) **Lactonase enzyme**
 - d) **Enolase enzyme**

- 32- What is the end product of Preparatory phase of glycolysis?
- a) **Pyruvate**
 - b) **ATP**
 - c) **Glyceraldehyde 3-phosphate**
 - d) **Dihydroxyacetone phosphate**
- 33- How many steps dose glucose 6-phosphate need to convert to glyceraldehyde 3-phosphate?
- a) **2 steps**
 - b) **3 steps**
 - c) **4 steps**
 - d) **5 steps**
- 34- What are the end products of Payoff phase of glycolysis?
- a) **1 Pyruvate, 1 ATP, 1 NADH**
 - b) **2 Pyruvate, 2 ATP, 2 NADH**
 - c) **3 Pyruvate, 3 ATP, 3 NADH**
 - d) **4 Pyruvate, 4 ATP, 4 NADH**
- 35- What are the end products of oxidative stage of Pentose Phosphate Pathway?
- a) **Ribose 5-phosphate, NADPH**
 - b) **Ribose 5-phosphate, NADH**
 - c) **Ribulose 5-phosphate, NADPH**
 - d) **Ribulose 5-phosphate, NADH**
- 36- Which one of the following has a role in converting glucose 6-phosphate to 6-phosphogluconolactone during Phosphogluconate Pathway?
- a) **Glucose 6-phosphate dehydrogenase enzyme**
 - b) **Gluconolactonase enzyme**
 - c) **6-phosphogluconate dehydrogenase enzyme**
 - d) **Glyceraldehyde 3-Phosphate dehydrogenase enzyme**
- 37- What are the end products of Entner-Doudoroff Pathway?
- a) **Pyruvate, glyceraldehyde-3-phosphate**
 - b) **Pyruvate, ATP, NADH**
 - c) **Pyruvate, Dihydroxyacetone Phosphate**
 - d) **Pyruvate, ATP, NADPH**
- 38- Which one of the following has a role in converting Pyruvate to Lactate during Lactic acid Fermentation?
- a) **Lactate hydrogenase enzyme**
 - b) **Lactate oxidase enzyme**
 - c) **Lactate dehydrogenase enzyme**

- d) Lactate isomerase enzyme**
- 39- How does α -Ketoglutarate convert to Glutamate during protein catabolism?
- a) By oxidation reduction reaction**
 - b) By decarboxylation reaction**
 - c) By oxidative decarboxylation reaction**
 - d) By transamination reaction**
- 40- Which one of the following has a role in converting Pyruvate to Acetaldehyde during Ethanol Fermentation?
- a) Pyruvate dehydrogenase enzyme**
 - b) Pyruvate decarboxylase enzyme**
 - c) Pyruvate hydrogenase enzyme**
 - d) Pyruvate oxidase enzyme**
- 41- Which one of the following produces by Condensation of Acetyl-CoA and Oxaloacetate during Krebs cycle?
- a) Succinate**
 - b) Fumarate**
 - c) Malate**
 - d) Citrate**
- 42- How does α -Ketoglutarate convert to Succinyl-CoA?
- a) By Oxidation reaction**
 - b) By Dehydrogenation reaction**
 - c) By Decarboxylation reaction**
 - d) By Hydration reaction**
- 43- Which one of the following refers to Complex I during Electron Transport Chain?
- a) Cytochrome oxidase**
 - b) Succinate dehydrogenase**
 - c) ATP synthase**
 - d) NADH dehydrogenase**
- 44- Which one of the following carries e from complex III to complex IV during Electron Transport Chain?
- a) Coenzyme Q₁₀**
 - b) Cytochrome c reductase**
 - c) Cytochrome c**
 - d) Ubiquinone**
- 45- Which one of the following refers to the process which the energy stored in NADH and FADH₂ is used to produce ATP?

- a) **Electron Transport Chain**
 - b) **Aerobic respiration**
 - c) **Oxidative Phosphorylation**
 - d) **Chemiosmosis**
- 46- Which one of the following breaks the triacylglycerols down to fatty acids and glycerol?
- a) **Lipases enzymes**
 - b) **Amylases enzymes**
 - c) **Proteases enzymes**
 - d) **Trypsin enzymes**
- 47- Where does the activation of fatty acid occur during lipid catabolism?
- a) **Mitochondrial matrix**
 - b) **Cytosol**
 - c) **Mitochondrial membrane**
 - d) **Cytoplasm**
- 48- Which one of the following produces from first oxidation of activated fatty acid?
- a) **Acetyl-CoA**
 - b) ***trans*- Δ^2 -Enoyl-CoA**
 - c) **L-3-Hydroxylacyl CoA**
 - d) **3-Ketoacyl CoA**
- 49- What is the first reaction should happen to Amino Acid during protein catabolism?
- a) **Decarboxylation**
 - b) **Dehydrogenation**
 - c) **Dehydroxylation**
 - d) **Deamination**
- 50- Which one of the following has a role in converting Arginine to Ornithine during Urea cycle?
- a) **Ornithine transcarbamylase**
 - b) **Arginase**
 - c) **Argininosuccinate synthetase**
 - d) **Argininosuccinate lyase**

Good luck

Dr/ Maysa M. Ali



The first question:-

(12 marks)

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

Boisser joined Napoleon's expedition to Egypt	()
Nabil El-Hadidi founded Assiut University herbarium (1961)	()
The correct name to Banger (البنجر) is <i>Brassica rapa</i> L.	()
The systems of Good & Firbas divided the globe into six botanical kingdoms	()
Among the palm street trees planted in Assiut is <i>Oreodoxa regia</i>	()
The street trees of <i>Casuarina equisetifolia</i> is characterized by palmate leaves	()
The flowers of <i>Albizzia lebbek</i> is take the shape of beard of pasha	()
<i>Citrus</i> trees are evergreen with dot glanded Leaves and a berry, 8-15 celled	()
<i>C. aurantium</i> is the Scientific name of the <i>Citrus</i> trees named Bortogallo	()
<i>Cocos nucifera</i> is a palm with ovoid, 3-angled, thick fibrous brownish fruits	()
<i>Mangifera indica</i> has elliptical leaves & yellowish or reddish flowers	()
The crops of <i>Lens</i> , <i>Vigna</i> and <i>Cicer</i> are called as cereals	()
Ancient Egyptian place <i>Allium sativum</i> inside the body at embalming of the dead	()
<i>Colocasia antiquorum</i> cultivated as a source of fibres and oils	()
<i>Olea europa</i> cultivated for more than 4000 years for its fruits and valuable oil	()
A big number of field weeds and canal banks are belonging to the Cruciferae	()
<i>Cynodon dactylon</i> is a wild grass with 5 digitate narrow spike.	()
<i>Orobanche minor</i> is a cruciferous weed with long narrow cylindrical silique	()
The isthmie desert extends between Nile Valley & Red Sea	()
The largest depression in the western desert is that of Qattara, 100 m BSL	()
<i>Citrullus colocynthis</i> is a desert plant belonging to family Cucurbitaceae is	()
<i>Ammophila arenaria</i> is an excellent sand-binder growing in moving sand of Mma.	()
<i>Achillea santolina</i> is among the growing barley fields plants of Mma.	()
<i>Asphodelus microcarpus</i> is growing in barley fields and is belonging to Liliaceae	()

second question:-**(12 marks - 0.5 mark each)**Choose the correct answer, put your answer in the table: - (0.5 mark each)

1. French, joined Napoleon's expedition to Egypt.
(a) Forsskal (b) Niebuhr (c) Boisser (d) Delile
2. German, wrote a Flora of Egypt in 2 volumes, 1912.
(a) Forsskal (b) Mushler (c) Boisser (d) Schweinfurth
3. The non standard scientific plant names could be known as names
(a) vernature (b) variaties (c) vernacular (d) valid
4. The duplicate specimens of the holotype is called as
(a) lectotypes (b) isotypes (c) holotypes (d) neotypes
5. According to Tackholm 1974, we recognize phytogeographical regions
(a) four (b) five (c) six (d) seven
6. The flowers of *Callistemon citrinus* is take the shape of
(a) leg of bird (b) trumbet (c) brush-like (d) beard of pasha
7. The aromatic oils plants of *Mentha*, *Ocimum* and *Daucus* are called as: -
(a) legumes (b) spices (c) cereals (d) pickles
8. is below sea level, while other oases are above except some parts of Kharga
(a) Dakhla (b) Siwa (c) Farafra (d) Feiran
9. Among street trees that belonging to Anacardiaceae and planted in Assiut is
(a) *Schinus molle* (b) *Anacardium nanum* (c) *Anacardium humile* (d) all the preceding
10. The most primitive living seed palms (Sago palm) is called as: -
(a) *Schinus molle* (b) *Khaya senegalensis* (c) *Cycas revoluta* (d) *Thuja orientalis*
11. The common arabic name (powder of afreet) of *Sterculia diversifolia* is due to
(a) stiff hairy seeds (b) bell-shaped flowers (c) sacred by hindus (d) all the preceding
12. The forked trunk palm with palmate leaves and large brown oval fruits is
(a) *Phonix dactylifera* (b) *Hyphaene thebaica* (c) *Cocos nucifera* (d) *Annona squamosa*
13. Cactaceae fruit tree, with trunk forming segmented cactus
(a) *Mangifera indica* (b) *Carica paoaya* (c) *Punica granatum* (d) *Opuntia ficus-indica*
14. Rhamnaceae tree with tri-nerved leaves & included in burial remains of Tutankhamun
(a) *Mangifera indica* (b) *Carica paoaya* (c) *Vitis vinifera* (d) *Zizyphus spina-christi*
15. Among cereals that cultivated in Egypt scince prehistoric times and Pharaons
(a) *Hordeum vulgare* (b) *Triticum pyramidale* (c) *Triticum durum* (d) all the preceding
16. Cultivated as a vegetable that eaten its roots fresh: -
(a) *Raphanus sativus* (b) *Cynara cardunculus* (c) *Corchorus olitorius* (d) *Brassica oleracea*
17. Cultivated as a source of dyes: -
(a) *Lawsonia inermis* (b) *Ricinus communis* (c) *Hibiscus esculentus* (d) all the preceding
18. A compositae weed with white spines around the flowering heads, flowers purple.
(a) *Medicago hispida* (b) *Centaurea calcitrapa* (c) *Brassica nigra* (d) *Avena fatua*
19. Known as black mustard weed and characterized by cruciferous yellow petals
(a) *Medicago hispida* (b) *Brassica nigra* (c) *Melilotus indica* (d) *Avena fatua*
20. A poisonous weed with monoecious flowers borne in a cyathium inflorescence.
(a) *Euphorbia peplus* (b) *Ammi majus* (c) *Convolvulus arvensis* (d) *Plantago magor*
21., deserts are areas devoid of vegetation or with less continuous cover
(a) Botanically (b) Geographically (c) traditionally (d) all the preceding
22. On seashore of Mma., pilae marinae formed by the leaf-sheaths fibre of
(a) *Hyoseris-lucida* (b) *Orlaya maritime* (c) *Pancratium maritimum* (d) *Posidonia oenica*
23. Among the growing rocky ridges plants of Mma. is
(a) *Thymus capitatus* (b) *Teucrium polium* (c) *Phagnalon rupestre* (d) all the preceding
24. *Mesembryanthemum crystallinum* is growing in barley fields and is belonging to
(a) Cistaceae (b) Aizoaceae (c) Cruciferae (d) Compositae

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The third question:- (26 marks)

- (i) Write short notes on the herbarium, with special references to its jobs (5 marks)**
- (ii) Write a small brief account about spices with aromatic oils (5 marks)**
- (iii) Write short notes about Mariut region and enumerate 5 plants belonging to different habitats growing in it (5 marks)**
- (iv) Write briefly on Oasis and enumerate 5 plants belonging to different families growing in it (5 marks)**
- (v) Give 1 botanical name and family of each of the following: - (6 marks)**
street tree, fruit tree, vegetable, medicinal, textile & ornamental plant

Best Wishes

Prof. Momen Zareh & Dr. Mona Hassan

Choose the Correct Answer for the following questions.

(Each question worth one point)

- 1- The safety and technological stability of lysozyme makes it an ideal for food applications.
 - a- sweetener
 - b- preservative antimicrobial
 - c- thickening agent

- 2- are of the common exotoxins producing bacteria.
 - a- *Staphylococcus aureus*
 - b- *Clostridium botulinum*
 - c- All of the above

- 3- are of the most lethal substances known that block nerve functions and can lead to respiratory and muscular paralysis.
 - a- Reuterin
 - b- Bacteriocins
 - c- Botulinum toxins

- 4- are heat stable and can not be inactivated by cooking.
 - a- *Clostridium botulinum* toxins
 - b- *Staphylococcus aureus* toxins
 - c- All of the above

- 5- Honey should not be fed to children under 12 months because of possible contamination with possibly because the microflora of the intestine are still immature and high risk of infection due to absence of protective bacteria that saves honey for older children and adults to eat.
 - a- *Lactococcus lactis*
 - b- *Clostridium botulinum*
 - c- *Lactobacillus reuteri*

- 6- is life-threatening, responsible for large food poisoning outbreaks.
 - a- *Escherichia coli* O157: H7
 - b- *Rhizobium leguminosarum*
 - c- *Lactococcus lactis*

- 7- are of the common foodborne pathogens.
- a- *Salmonella*, *Campylobacter* and *Shigella*
 - b- *Acetobacter aceti*
 - c- *Lactococcus lactis*
- 8- Chemical food preservatives such as are widely used in food industry and are invariably cheap ingredients that are effective against a wide range of microbes.
- a- sorbic and benzoic acids
 - b- sodium nitrate and nitrite
 - c- All of the above
- 9- is among the major proteins in egg white where it acts as antimicrobial and serves to protect and nourish the developing embryo.
- a- Reuterin
 - b- Bacteriocin
 - c- Lysozyme
- 10- are of the most common past and present methods for food preservation.
- a- Salting
 - b- Drying
 - c- All of the above
- 11- Extrinsic growth factors that affect the presence of microorganisms in food include
- a- Nutrients content of the food
 - b- Storage temperature
 - c- All of the above
- 12- Many species of bacteria including most pathogens are inhibited by in stored food.
- a- low pH
 - b- neutral pH
 - c- weakly alkaline pH
- 13- was reported as a source of foodborne botulism, a life-threatening paralytic disease caused by a neurotoxin produced by *Clostridium botulinum*.
- a- Dry bread
 - b- Uncooked blood sausage
 - c- Egg white

- 14- is one of the important intrinsic growth factors that affect the presence of microorganisms in food.
- a- Antimicrobial substances
 - b- Relative humidity of food storage environment
 - c- Storage temperature
- 15- The ability of to oxidize ethanol to acetic acid allows for its unwanted growth in fermented beverages, such as wine, cider, beer and soft beverages causing an undesirable sour taste.
- a- *Salmonella enteritidis*
 - b- *Clostridium botulinum*
 - c- *Acetobacter aceti*
- 16- Despite the benefits of vacuum packaging of some food products, there are risks with vacuum sealed food where some can grow much better and faster in vacuum sealed food products.
- a- Microaerophilic bacteria
 - b- Obligate aerobic bacteria
 - c- Viruses
- 17- Intrinsic growth factors that affect the presence of microorganisms in food include
- a- water availability and nutrients content of the food
 - b- biological barriers
 - c- All of the above
- 18- Modern types of food preservation include
- a- Canning and aseptic food packaging
 - b- Gamma radiation
 - c- All of the above
- 19- is generally transmitted via a fecal-oral route and thus eating vegetables from a field contaminated with sewage can lead to infection by this pathogenic bacterium.
- a- *Shigella*
 - b- *Acetobacter aceti*
 - c- *Lactobacillus reuteri*

- 20- Lysozyme catalyses the the hydrolysis of the β -1,4-glycosidic bond between *N*-acetylmuramic acid and *N*-acetylglucosamine of peptidoglycan, a structural component of the bacterial cell wall and is effective mainly against
- a- Gram-negative bacteria
 - b- Gram-positive bacteria
 - c- None of the above
- 21- can cause food spoilage at low temperature.
- a- Psychrophilic bacteria
 - b- Thermophilic bacteria
 - c- All of the above
- 22- Dry grains must be stored in an environment with to avoid mold spoilage.
- a- high humidity
 - b- low humidity
 - c- moderate humidity
- 23- In 1894 J. Denys associated with death of a person who ate meat prepared from a diseased cow.
- a- pyogenic *Staphylococcus*
 - b- *Lactobacillus*
 - c- *Acetobacter*
- 24- foodborne infection is commonly associated with poultry products.
- a- *Salmonella*
 - b- *Lactobacillus*
 - c- *Bifidobacterium*
- 25- *Clostridium botulinum* requires for growth and producing toxins in contaminated food.
- a- anaerobic condition
 - b- aerobic condition
 - c- aerobic or anaerobic condition

26- Which one of the following could cause fruits rotting and rancid flavor in dairy products?

- a) *Aspergillus* sp.
- b) *Alternaria* sp.
- c) *Fusarium* sp.
- d) Yeast

27- Which one of the following associated with rot in citrus fruits, potatoes, grains and mycotoxins producer?

- a) *Penicillium* sp.
- b) *Mucor* sp.
- c) *Alternaria* sp.
- d) *Fusarium* sp.

28- Which one of the following could use as food additive?

- a) *Aspergillus flavus*
- b) *Aspergillus oryzae*
- c) *Aspergillus parasiticus*
- d) *Aspergillus niger*

29- Which one of the following could use as source of enzymes, cause spoilage of vegetables and use in food fermentation?

- a) *Rhizopus* sp.
- b) *Alternaria* sp.
- c) *Mucor* sp.
- d) *Aspergillus* sp.

30- Which one of the following could use in baking, alcoholic fermentation and cause spoilage of food?

- a) *Saccharomyces* sp.
- b) *Candida* sp.
- c) *Zygosaccharomyces* sp.
- d) *Rhodotorula* sp.

31- Which one of the following could use in oriented food fermentation and cause spoilage to food?

- a) *Torulopsis* sp.
- b) *Candida* sp.
- c) *Pichia* sp.
- d) *Kluyveromyces* sp.

32- Which one of the following could form pigments and cause discoloration of meat?

- a) *Cryptococcus* sp.
- b) *Rhodotorula* sp.
- c) *Yarrowia* sp.
- d) *Torulopsis* sp.

33- Which one of the following able to hydrolyze triglycerides?

- a) *Enterobacter* sp.
- b) *Aeromonas* sp.
- c) *Micrococcus* sp.
- d) *Clostridium* sp.

34- Which one of the following able to hydrolyze complex carbohydrates ?

- a) *Pseudomonas* sp.
- b) *Staphylococcus* sp.
- c) *Flavobacterium* sp.
- d) *Alteromonas* sp.

35- Which one of the following able to grow at 50°C and above?

- a) *Yersinia*
- b) *Aeromonas*
- c) *Listeria*
- d) *Clostridium*

36- Which one of the following could grow at a relatively high osmotic environment?

- a) *Enterobacter* sp.
- b) *Escherichia* sp.
- c) *Lactobacillus* sp.
- d) *Clostridium* sp.

37- Which one of the following known as enteric pathogens?

- a) *Leuconostoc* sp.
- b) *Pediococcus* sp.
- c) *Lactobacillus* sp.
- d) *Salmonella* sp.

- 38- Which one of the following could found in food animals?
- a) *Campylobacter* sp.
 - b) *Micrococcus* sp.
 - c) *Pseudomonas* sp.
 - d) *Flavobacterium* sp.
- 39- Which one of the following could contaminate food fish?
- a) *Yersinia enterocolitica*
 - b) *Escherichia coli*
 - c) *Vibrio parahaemolyticus*
 - d) *Listeria monocytogenes*
- 40- What is the normal microbial load of ground meat?
- a) 100 -1000 microb/g
 - b) 1000 -10000 microb/g
 - c) 10000 – 100000 microb/g
 - d) 10 – 100 microb/g
- 41- What is the normal microbial load of raw milk?
- a) Less than 100 microb/ml
 - b) Less than 1000 microb/ml
 - c) More than 1000 microb/ml
 - d) 1000 microb/ml
- 42- What is the normal microbial load of shell egg?
- a) 1000 bacteria cells
 - b) 1 million bacteria cells
 - c) 10 million bacteria cells
 - d) 100 million bacteria cells
- 43- What is the normal coliform load of grains?
- a) 10 cell/g
 - b) 100 cell/g
 - c) 1000 cell/g
 - d) 10000 cell/g
- 44- What is the normal microbial load of bottled water?
- a) 100 bacterial cell /100ml
 - b) 1000 bacterial cell/100ml
 - c) 10000 bacterial cell/100ml

- d) 100000 bacterial cell/100ml
- 45- Which one of the following could produce lactic acid from galactose?
- a) *Streptococcus thermophiles*
 - b) *Lactobacillus reuteri*
 - c) *Lactococcus lactis*
 - d) *Acetobacter aceti*
- 46- Which one of the following could hydrolyze lactose and produce ethanol?
- a) *Candida utilis*
 - b) *Saccharomyces cerevisiae*
 - c) *Kluyveromyces marxianus*
 - d) *Pichia pastoris*
- 47- Which one of the following could use to produce citric acid and gluconic acid from sucrose?
- a) *Aspergillus oryzae*
 - b) *Aspergillus niger*
 - c) *Aspergillus fumigatus*
 - d) *Aspergillus terreus*
- 48- Which one of the following could produce vitamin C from cheese whey?
- a) Bacteria
 - b) Yeast
 - c) Fungi
 - d) Viruses
- 49- Which one of the following could produce astaxanthine pigment?
- a) *Xanthomonas* sp.
 - b) *Pichia* sp.
 - c) *Phaffia* sp.
 - d) *Candida* sp.
- 50- Which one of the following could produce Dextran from sucrose?
- a) *Xanthomonas campestris*
 - b) *Leuconostoc mesenteroides*
 - c) *Lactobacillus Acidophilus*
 - d) *Streptococcus thermophiles*

Good luck

Dr/ Maysa M. Ali

Choose the Correct Answer for the following questions.

(Each question worth one point)

- 1- are the major decomposers in the ecosystems which perform a valuable service as Earth's cleanup crew.
 - a- Bacteria and fungi
 - b- Algae
 - c- Plants

- 2- The first highly characterized outbreak of which is a severe form of pneumonia, occurred in 1976 at an American Legion convention in Philadelphia.
 - a- Legionnaires' disease
 - b- Anthrax
 - c- Brucellosis

- 3- In an example of the danger of airborne phytopathogenic microbes and its aerosolization, the airborne spread of spores causing the late blight of potato led to the 1845 epidemic known as the Irish potato famine where the famine related deaths are estimated from 750,000 to 1,000,000.
 - a- *Penicillium notatum*
 - b- *Phytophthora infestans*
 - c- *Aspergillus fumigatus*

- 4- are the two indoor environments with perhaps the greatest potential for the aerosolization of pathogenic microorganisms.
 - a- Hospitals and clinical microbiology laboratories
 - b- Swimming beaches and sports clubs
 - c- Non of the above

- 5- In addition to its natural reservoirs, there are many human-made systems within which the pathogenic bacterium *Legionella pneumophila* can find a niche. These include
 - a- cooling towers and evaporative condensers
 - b- plumbing systems, whirlpools , shower heads and hot-water faucets
 - c- All of the above

- 6- The dynamics of an ecosystem include two major processes which are.....
- a- cycling of carbon and sulfur
 - b- decomposition and consumption
 - c- the flow of energy and cycling of chemical nutrients
- 7- is the study of microorganisms associated with indoor environments.
- a- Intramural aeromicrobiology
 - b- Clouds microbiology
 - c- Extramural aeromicrobiology
- 8- Bacteria perform important types of reactions in the Nitrogen cycle. These reactions are
- a- Nitrogen fixation and ammonification
 - b- Nitrification and denitrification
 - c- All of the above
- 9- Because of the poor design of the air circulation system at the 1976 American Legion convention, proliferation in a poorly maintained cooling tower led to the subsequent aerosolization and spread of the organism throughout the building.
- a- *Brucella*
 - b- *Legionella*
 - c- *Bacillus anthracis*
- 10- produces sulfuric acid through sulfur oxidation which cause dissolution of phosphates.
- a- *Thiobacillus*
 - b- *Rhodobacter*
 - c- *Escherichia coli*
- 11- In 1988, eight employees in a clinical microbiological laboratory in USA developed acute brucellosis. A survey of the laboratory and the personnel showed that a cryogenically stored clinical isolate of *Brucella* sp. had been thawed and subcultured without the use of a biosafety cabinet. This example can
- a- demonstrate the ease with which a bioaerosol can spread within areas where pathogens are handled for research and clinical purposes.
 - b- indicate the importance of bioaerosol control methodologies
 - c- All of the above.

- 12- Anthrax is an acute zoonotic disease caused by the spore-forming bacterium, a microbe that lives in the soil where vaccination is recommended for people at high risk of infection.
- a- *Clostridium botulinum*
 - b- *Bacillus anthracis*
 - c- *Escherichia coli*
- 13- Extramural aeromicrobiology includes and others.
- a- aerosolization of indigenous soil pathogens
 - b- the spread of airborne pathogens associated with waste environments
 - c- All of the above
- 14- The occurrence of 2001 crisis in the United Kingdom is an example of the importance of bioaerosols in the spread of airborne diseases where this viral disease is a highly contagious disease of cloven-hoofed livestock.
- a- Tuberculosis
 - b- Anthrax
 - c- foot-and-mouth disease
- 15- The aeromicrobiological pathway involves
- a- Launching of bioaerosols into the air
 - b- Transport and deposition
 - c- All of the above
- 16- is the type of transport of bioaerosols common within buildings or other confined spaces as it involves short periods of time, under 10 minutes and relatively short distances, under 100 m.
- a- Macroscale transport
 - b- Mesoscale transport
 - c- Submicroscale transport
- 17- is the highest level in the biological hierarchy.
- a- Ecosystem
 - b- Community
 - c- Biosphere
- 18- Biological entities suspended in air are called
- a- bioaerosols
 - b- biosphere
 - c- planktons

- 19- In an example of the economic destruction of airborne phytopathogenic microbes and its aerosolization, in 1993, epidemic was responsible for the loss of over 40 million bushels of wheat in Kansas and Nebraska alone.
- a- *Puccinia* wheat rust
 - b- *Fusarium* head blight of wheat
 - c- All of the above
- 20- Microorganisms typically have an overall negative charge associated with their surfaces at neutral pH. These negatively charged particles can associate with other positively charged airborne particles, resulting in of bioaerosols.
- a- electrostatic condensation and deposition
 - b- difficulties in deposition
 - c- None of the above
- 21- Gram-negative bacteria possess endotoxin which is derived from the outer membrane. The endotoxin is liberated and aerosolized when these bacteria are lysed where in addition to its other health threats, such endotoxin is considered
- a- Lipopolysaccharide (LPS) – an aerobiological allergen
 - b- Botulinum toxin – a neurotoxin
 - c- None of the above
- 22- The roles of microorganisms in most ecosystems include
- a- primary producers
 - b- decomposition of organic matter and chemical nutrients cycling
 - c- All of the above
- 23- In moist environments within buildings can proliferate rapidly within days and become established as colonies on solid surfaces, subsequently releasing toxins and/or allergens into the air.
- a- Viruses
 - b- molds and bacteria
 - c- None of the above
- 24- are considered as primary producers in the ecosystems.
- a- Animals and insects
 - b- Cyanobacteria, algae and plants
 - c- Fungi
- 25- Most microorganisms are unicellular where is the lowest level of biological organization that can perform all activities required for life.
- a- the cell
 - b- tissue
 - c- an organ

26. Each of the following from the basic types of freshwater ecosystem:

- a- Lentic b- Lotic c- Wetlands d- All of them

27. Its Size ranged between 0.2-2 μm such as bacterioplankton:

- a. Femtoplankton b. Picoplankton c. Microplankton d. Macroplankton

28. From the factors limiting the growth of water microorganisms:

- a. Water movement b. non-organic substances
c. Trophicity of surface water d. All are correct

29. White rice diarrhea symptoms caused by:

- a. *Vibrio cholerae* b. *Salmonella typhi*
c. *Clostridium botulinum* d. *Mycobacterium marinum*

30. Major faecal contaminant in potable water is:

- a. *E. coli* b. Streptococci c. Spore forming d. All are correct

31. MVIC test is carried out to distinguish the presence of:

- a. *E. coli* from *Clostridium* b. *E. coli* from *Enterobacter aerogenes*
c. *E. coli* from *Streptococcus* d. *E. coli* from other bacteria

32. Sedimentation of large particulate matter is enhanced by:

- a. Aluminum sulphate b. Potassium nitrate
c. Potassium permanganate d. Chlorination

33. High BOD indicates:

- a. Less polluted water b. Less number of organisms
c. More polluted water d. None of these

34. Microbial examination of water for all of the following except:

- a. detection of recent and potentially pathogens b. provides a hygienic assessment
of potable water c. identification of individual organisms d. a and d are correct

35. Characteristics of indicator organisms for water bacteriology:

- a. Present of feces in abundant number b. Present in scanty number in other sources
c. More resistant to disinfectants like chlorine d. from a to c are correct

**The second question: Choose the correct option (T or F) for each of the followings
(by shading and blurring in the provided bubble sheet):- (15 marks)**

36. In fresh water benthic zone, methane producing bacteria could live.
37. Meroplankton spends entire lifecycle as plankton such as Jellyfish, diatoms and bacteria.
38. Blue light (366-436 nm) inhibits the nitrite oxidation by *Nitrobacter vinogradskyi*.
39. Recreational water may contain 2000 CFU coliform/100 ml.
40. The source of Salmonellosis is drinking water contaminated with virus.
41. Wastewater comes from sewage, house washing and industrial effluent and contains a high quantity of inorganic matter.
42. BOD is the amount of O₂ needed for decomposition of organic matter by microorganisms.
43. Wastewater treatment include preliminary, primary, secondary and tertiary treatment.
44. Using chemical precipitation for water softening.
45. Most skin not a favorable environment because of periodic drying.
46. Saliva is a medium but is not pervasive source for nutrients.
47. Weakened immune system allows the wrong microbes to grow out of control.
48. *Staphylococcus aureus*, *Streptococcus pneumoniae* and *Aspergillus* sp. are opportunistic pathogens of the respiratory tract.
49. Bacteria may account for up to 1/4 of the mass of faeces.
50. The oral flora contributes to immunity by inducing low levels of circulating and secretory antibodies.

Good luck

Prof. Dr. Fathy Morsy

Dr. Amal Danial

Part II: Bacterial Symbiosis

(25 marks)

A. Answer three Only questions. Use well labeled diagrams where appropriate.
(12 marks)

1. Explain how the luminescent bacteria in fish turning on the lights.
2. Discuss the mechanisms of plant infection by Crown Gall diseases.
3. How skin microflora controls the bacterial infections of the skin.
4. Write on the rumen and ruminant animals.

B. Write short notes on (two Only): (6 marks)

1. Nod factors
2. Function and structure of nitrogenase enzyme
3. Primary symbionts

C. Put a mark (✓) in front of the correct statement and a mark (X) in front of the wrong statement with error correction: (7 marks)

1. The function of the bacterial endosymbionts in the trophosome of giant tube worms is to reduce hydrogen sulfide. ()
2. The relationship between human and normal intestinal bacteria is a parasitism. ()
3. Leghemoglobin is synthesized only by rhizobia to facilitate an anaerobic environment for nitrogen fixation process. ()
4. As nitrogen fertility in the soil increases, nitrogen fixation by rhizobia within legume roots increases greatly. ()
5. *Frankia* is able to live as an endosymbiont with *Gunnera* ()
6. *Riftia pachyptila* depend in their nutrition on the algae that present in water. ()
7. *Rhizobium* spp. whose nodulation functions (*nif* gene) are encoded on their chromosome. ()

Good luck

D. Shymaa Ryhan

Assiut University Faculty of Science Botany & Microbiology Department			جامعة أسيوط كلية العلوم قسم النبات والميكروبيولوجي
Symbiosis Microbiology (Code: 496 B)	Final exam (2022-2023)	Time: 2 hours	
Microbiology & Botany students (4 th level)			

Part (I)

Answer the following questions

Q1: Choose the correct answers for the following questions (Put your answer in table in the answer paper): (25 marks)

- When one species benefits and the other is unaffected it's called
(a) mutualism (b) commensalism (c) competition (d) neutralism
- is the development of hyphae between the root cells to form a complex highly branched structure.
(a) Mantle (b) Hartig net (c) Extraradical mycelium (d) Hypha
- The majority of fungal species involved in the ectomycorrhiza symbiosis belong to family
(a) basidiomycetes (b) ascomycetes (c) zygomycetes (d) oomycetes
- mycorrhizas have a thick compact mycelial sheath, a hartig net one cell deep in the root cortex, and thus limited to the intracellular penetration.
(a) Arbutoid (b) Monotropoid (c) Ericoid (d) Orchids
- mycorrhiza can degrade pectins and lignins making the carbon compounds available for the fungal growth during times of limited photosynthetic activity.
a) Arbutoid (b) Monotropoid (c) Ericoid (d) Orchids
- is a mass of cells that are produced when a seed germinates.
(a) Mantle (b) Hartig net (c) Extraradical mycelium (d) Protocorm

7. mycorrhizal fungi are obligate symbiotic fungi and endosymbionts of a variety of plants within the Angiosperms, Gymnosperms and Pteridophytes.
 (a) Arbuscular (b) Monotropoid (c) Orchids (d) Not of previous
8. Arbuscular mycorrhizas were formerly classified in the phylumunder the family Endogonaceae due to their resemblance with Endogone species.
 (a) ascomycota (b) basidiomycota (c) zygomycota (d) oomycetes
9. The lichens type has tightly clustered and slightly flattened pebble-like units.
 (a) crustose (b) squamulose (c) foliose (d) fruticose
10. The lichens type has leaflike units, with flat sheets of tissue not tightly bound.
 (a) crustose (b) squamulose (c) foliose (d) fruticose
11. Symbiotic relationship is characterized by the exchange of nutrients.
 (a) True (b) False
12. For symbiotic association the phytobiont represented the suitable fungus.
 (a) True (b) False
13. Only 20% of the plant species are associated with mycorrhizal fungi.
 (a) True (b) False
14. In obligate mycorrhizal plants, the plants not solely dependent on the fungus for phosphorus or other nutrients.
 (a) True (b) False
15. In facultative mycorrhizal plants, the level of association is dependent on the soil fertility.
 (a) True (b) False
16. Non-mycorrhizal plants inability to support the mycorrhizal colonization is due to the accumulation of alkaloids, cyanogenic glucosinolates and antifungal compounds.
 (a) True (b) False
17. Ericoid is a type of the ectomycorrhiza that associated with herbaceous plants, and shrubs.
 (a) True (b) False

18. Ectendomycorrhizae differ from ectomycorrhizae in that after Hartig net formation, intracellular hyphae develop between epidermal and cortical cells.
(a) True (b) False
19. Ericoid occur only within the family Orchidaceae, one of the largest families of flowering plants.
(a) True (b) False
20. The presence of rough endoreticulum and balloon-like golgi equivalents act as storage compartments in AM.
(a) True (b) False
21. In the symbiotic stage, AM fungal spores are produced in the soil naturally by the extraradical hyphae.
(a) True (b) False
22. The asymbiotic stage is sometimes referred to the resting stage of the AM fungal cycle.
(a) True (b) False
23. Intraradical hyphae is a term used to describe hyphal tip enlargement that attaches to the root surface of the host.
(a) True (b) False
24. Arum-type of AM has thick coiled hyphae which spread intracellularly.
(a) True (b) False
25. AM fungi release a myc-factor which activates the nodulation factor's inducible gene MtEnod11.
(a) True (b) False

With my best wishes

Dr. Ghada Abd-Elmonsef Mahmoud



كلية معتمدة

بتاريخ ٠١٢/٧/١٢

Immunology Exam for Fourth Year Science Students

I) Choose correct answer (1mark x 20)

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

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

2- A complement component which is strongly chemotactic for neutrophils is:

- a) C3
- b) C3b
- c) C5a
- d) C5b

3- 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

4- 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

5- Which of the following is a Recombinant vaccine?

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

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

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

7- 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

8- 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

9-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

10-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

11-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

12- Which is the major difference between CD8+ and NK cell cytotoxicity?

- a) Cytotoxic T cells recognize virus infected cells by recognizing viral antigens on the surface of the target cell
- b) Only cytotoxic T cells kill host cells infected with intracellular bacteria
- c) Only NK cells induce target cell death by apoptosis
- d) Only NK cells use perforins and granzymes to induce cytotoxicity

13- Which cells utilize reactive oxygen species and lysosomal enzymes to kill pathogens?

- a) Cytotoxic T cells
- b) Macrophages
- c) Natural killer (NK) cells
- d) Th1 cells

14- C3b 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

15- Monoclonal antibodies recognize a single

- a) Antigen
- b) Bacterium
- c) Epitope

16- Sequelae associated with exposure to super-antigen 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

17- Non-immunogenic antigen that can be covalently linked to a carrier protein to make it an immunogenic molecule is termed:

- a) Adjuvant
- b) Carrier
- c) Hapten
- d) Superantigen

18-Fusion between a plasma cell and a tumor cell creates a:

- a) Myeloma
- b) Lymphoblast
- c) Lymphoma
- d) Hybridoma

19-Antibody responses to non-protein antigens, such as polysaccharides and lipids, antigen specific helper T cells for antibody production. These are called.....

- a) Do not require, T-independent antigens
- b) Require, T-independent antigens
- c) Do not require, T-dependent antigens
- d) Require, T-dependent antigens

20- Which is an effector cell involved in ADCC of viral infected cells?

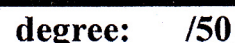
- a) B cells
- b) Helper T cells
- c) Natural killer cells
- d) Regulatory T cells

II) Put (T) true or (F) false for the following statement (1 mark x 30):

1	Natural immunity gives early rapid responses to a broad range of foreign substances.	
2	Naïve B cell areas in the spleen are in the follicles of the Marginal zone.	
3	First immunoglobulin class produced in primary response to an antigen is IgM.	
4	High temperature (fever).is a biological barrier because is not suitable for bacterial growth.	
5	Pro-inflammatory cytokines are activated proteins destroy pathogen plasma membranes.	
6	In type III hypersensitivity, Neutrophils are attracted by C5a and bind immune Complexes by their Fc receptors and release lysosomal enzyme causing tissue damage	
7	Antigen persistence is prolonged and co stimulatory signals are enhanced with adjuvants	
8	Super antigens are class of antigens bind outside antigen-binding cleft and cause nonspecific activation of T-cells resulting in polyclonal activation of T cells	
9	T cell receptor is composed of a dimer of alpha (α) and beta (β) chains which is non Covalently associated with CD3 complex.	
10	Class-I MHC are found on all nucleated cells.	
11	T cell independent antigens have repeating epitopes on surface e.g. bacterial	

	polysacharrides.	
12	TNF α is An example of a cytokine produced by activated macrophages with a major role in the innate immune response.	
13	The sequelae associated with exposure to superantigen is due to release of large amount of Antibodies.	
14	Once B cells leave the bone marrow they are completely immature.	
15	CD40L on surface of activated T cells, binds CD40 on B cells and helps B cell activation.	
16	The specificity of an antibody is due to the heavy chains.	
17	Haptens are not immunogenic and can't produce by themselves antibodies.	
18	Immune system enhances the local establishment or systemic dissemination of bacteria, viruses, fungi and protozoa.	
19	The most abundant immunoglobulin class in serum is IgG	
20	The membrane attack complex in the complement pathway consists of C5a, 6, 7, 8, 9	
21	T cells respond only to antigens associated with MHC molecules on antigen presenting cells	
22	Adaptive immunity is an inducible specific immune response to particular infectious agents	
23	NK cells play a similar role of cytotoxic T cells but its action is MHC restricted	
24	"Magic bullet" therapy is done by using polyclonal antibodies to tumour specific antigens alone or after coupling to cytotoxic agents	
25	Opsonins are macromolecules attach to microbial surface (IgG & C5b) and can be recognized by receptors on phagocytes to enhance phagocytosis.	
26	B cell receptors consist of IgM Only.	
27	Chemotaxis is an ameboid movement (cell migration) occurs in and out of blood Vessels and throughout the tissues.	
28	Substances that enhance the immunogenicity of molecules without altering composition are termed Carriers.	
29	Digestion of engulfed material inside the phagolysosome occur only by lysozomal granules content (e.g. hydrolytic and proteolytic enzymes)	
30	Macrophages are the main producers of Pro inflammatory cytokines.	

GOOD LUCK



11. Tetracyclines bind to the 30s subunit of microbial ribosomes. They inhibit protein synthesis by blocking the attachment of charged aminoacyl-tRNA to the B site on the ribosome.
A) True B) False
12. Frankia strains have been known to secrete extracellular cellulases, pectinases, and proteinases.
A) True B) False
13. Streptomycin was the first effective antibiotic against TB.
A) True B) False
14. *Nocardiosis*, an endophytic actinobacterium associated with mandarin recorded highest IAA production.
A) True B) False
15. Chloramphenicol is a bactericidal antimicrobial.
A) True B) False
16. Heterobactin is a siderophore of *Rhodococcus* and *Nocardia*.
A) True B) False
17. Actinobacteria prefer alkaline growth condition.
A) True B) False
18. Streptomycetes produce antifungal compounds including nystatin from *Streptomyces nodosus*.
A) True B) False
19. Researcher have reported high siderophore production by *Streptomyces* sp., *Pseudonocardia* sp. and *Arthrobacter* sp.
A) True B) False
20. Tetracycline used to treat acne and cholera.
A) True B) False

Part 2: choose correct answer in the following sentences: - (30 marks)

1. Vegetative hyphae of *Frankia alni* arein diameter

- a- 1-2.5 μm b- 0.5-2.0 μm c- 5-10 μm d- 2-5 μm

2. Rhizospheric actinomycetes influence plant growth directly by

- a- N_2 fixation b- phosphate solubilization c- siderophores d- all of them

3. *Streptomyces* are:

- a- All strict anaerobes b- Predominantly found in soil
c- Cell wall type III d- 1.5-5.0 μm in diameter

4. *Frankia* is responsible for of the biologically fixed nitrogen in the world

- a- 15% b- 20% c- 30% d- 40%

5. The first chemical synthesized antibiotic was

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

6. Nodules range from.....

- a- 1-5 cm b- 1-7 cm c- 1-9 d- 1-15 cm

7. *Rhizobium* spp. and *Bacillus* spp produced.....for phosphate solubilization

- a- gluconic acid b- 2-ketogluconic acid c- oxalic acid d- malonic acid

8. β -lactam ring is present in

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

9. Actinomycetes are known to produce.....

- a- pyruvate b- lactate c- α -ketoglutarate d- all of them

10. Microbes produce variety of siderophores and a major class includes.....

- a- catechols b- hydroxamate
c- catechols and hydroxamate d- catechols, hydroxamate and oxyhydroxamate

11. Actinobacteria have ability to secrete Enzymes

- a- Cellulases b- Pectinases c- keratinases d- all of them

12. Iron chelation by microbial siderophores from soil depends on its

- a- pH b- concentration c- redox potential d- pH, concentration, redox potential

13. *Streptomyces*..... responsible to a distinct soil odor
a- *fradiae* b- *griseus* c- *antibioticus* d- *venezuelae*.
14. Indole acetic acid effects on
a- florescence b- photosynthesis
c- pigment formation d- florescence, photosynthesis, and pigment formation
15. *Streptomyces*produce the antibiotic lomofungin
a- *fradiae* b- *griseus* c- *antibioticus* d- *Lomondensis*
16. Streptomycin belongs to the antibiotic class.....
a- Aminoglycosides b- Macrolides c- Lipopeptide d- chloramphenicol
17. *Streptomyces platensis* produce the antineoplastic drug
a- bleomycin b- neomycin c- migrastatin d- actionmycin
18. Neomycin produced by *Streptomyces*
a- *griseus* b- *cattleya* c- *fradiae* d- *clavuligerus*
19. *Streptomyces* produce boromycin
a- *fradiae* b- *griseus* c- *antibioticus* d- *venezuelae*.
20. Boromycin belongs to the antibiotic class.....
a- aminoglycosides b- macrolides c- lipopeptide d- tetracyclines
21. Actinomycetes are long chain-forming bacteria resembles in structure with:
a- Fungi b- Algae c- Gymnosperm d- angiosperm
22. Family streptomycetaceae include.....
a- *Streptomyces* b- *Streptoacidiphilus* c- *Kitasatospora* d- all of them
23. *Streptomyces* produce chloramphenicol
a- *fradiae* b- *griseus* c- *antibioticus* d- *venezuelae*
24. Siderophores have been implicated for.....
a- N₂ fixation b- Antibacterial potential c- Nodulation d- all of them
25. *Streptomyces*.....Produce Erythromycin
a- *platensis* b- *endus* c- *erythreus* d- *griseus*

26. *Streptomyces griseus* produce

- a-Streptomycin b-Chloramphenicol c- Neomycin d- Bialaphos

27. The actinomycetes *Frankia* is of fundamental and ecological interests for....

- a- ability to fix nitrogen b-differentiate into sporangium and vesicles
c-nodulate plants from about 24 genera d- all of them

28. Aerial mycelia can formhyphae.

- a- primary b- Reproductive c- Substrate d- all of these

29. *Frankia* mode of life is

- a- free in soil b- symbiotic with many plants
c- free in soil or symbiotic with many plants d- parasitic

30. The size of vegetative hyphae of *Streptomyces* range between μm diameter.

- a-0.5-1.0 b-1-2 c-2.0-3 d- 4.5-6

With best regards -----Professor Dr: Sanaa Mohamed Fahmy