Benha Universit
Faculty of Science
Botany and Microbiology Department

Level: Fourth level (Microbiology & Chemistry) **Date:** 30/12/2018
Time: 2 hours **Course**: Standard analysis and environmental pollution (453 B)

Q1: Choose the correct answer in the following:

1. Fatty acid composition in bacteria is characterized as……
a) Conserved b) Stable c) Changeable d) a&b
2. Fatty acid content of microorganisms can be identified and detected through……..
a) Gas chromatography b) RT-PCR c) FISH d) ELISA
3. Mass spectrometry is used for determining…….. of the molecules
a) Mass b)elemental composition c) chemical structure d) All of these
4. For protein detection, the most commonly used probe is……
a) Primer b) Nucleic acid c) Antibodies d) All of these
5. O or H antigen of *E. coli* O157 can be detected from water samples using…..
a) PCR b) ELISA c) NASBA d)FISH
6. A microscopic-based method used for detection of specific microorganisms is ……..
a) NASBA b)FISH c) PCR d) Microarray
7. The products of PCR technique are known as……..
a) Primer b) Probe c) Amplicons d) None of these
8. Technique used for detection through synthesizing several copies of DNA sequences is……
a) PCR b) ELISA c) NASBA d)FISH
9. Nucleic acids based technique used to determine the starting quantity of the target sequence contained in the sample……..
a) RT-PCR b) PCR c) NASBA d)FISH
10. ……..is an mRNA based technology that confirm the presence and viability of a target organism
a) RT-PCR b) PCR c) NASBA d)FISH
11. In NASBA technique, the RNA template is destroyed by ……..
a) Reverse transcriptase b) RNAse H c) RNA polymerase d) DNA polymerase
12.…….. is a technique used for detection of multiple genes or organisms at the same time
a) Biosensors b) FRET c) Gas Chromatography d) Microarray
13. Sensing device that is able to detect signals even at low concentrations of the analyte
a) Biosensors b) FRET c) PCR d) Microarray
14. Biological component of biosensor is……..
a) Probe b) Nucleic acid c) Antibodies d) All of these
15. The main pollutants which can promote eutrophication are……..
a) Suspended solids b)Heat c) O_2 d) Oil
16. Increasing the heat of water leads to ……. The amount of (DO)
a)Raising b) Reducing c) Degrading d) not effect
17. Sulfur-laden water resulted from mine drainage increases…..of stream or lake
a) Alkalinity b) Basicity c) Acidity d) Heat
18.……..deplete the water's oxygen and create anaerobic conditions
a) Heat b) Suspended solids c) Agricultural wastes d) O_2-demanding substances
19. The biological oxygen demand (BOD) would be most directly affected by the presence of which of the following pollutants……
a) Heavy metals b) Organic wastes c) Sediment d) Mining wastes

20. ……. is water borne pathogen causes winter vomiting sickness and short-lived immunity
a) Adenovirus b) Rotavirus c) Enterovirus d) Norovirus
21. RNA virus, causal agent of infant mortality and acute gastroenteritis of children, is…….
a) Enterovirus b) Adenovirus c) Norovirus d) Rotavirus
22. Lifelong immunity is incurred with no liver damage in the infection of ……..
a) Hepatitis A b) Hepatitis C c) Retrovirus d) Enterovirus
23. Microorganisms that require increased carbon dioxide for growth are known as……
a)Microaerophilic b) Microaerophobic c) Capnophobic d) Capnophilic
24. The causal agent of ulceration and bloody diarrhea is…….
a) *Salmonella* b) *Shigella* c) *Cholera* d) *camplylobacter*
25. *E. coli* O157:H7, a virulent pathogen, is classified as……
a) EHEC b) ETEC c) EIEC d) EAEC
26. Ingestion of enterohemorrhagic *E. coli* can lead to…….
a) Typhoid fever b) Hemolytic uremic syndrome c) Watery diarrhea d) a&c
27. ……. Produces a toxin that changes ionic fluxes resulting in water diarrhea
.a) *E.coli* b) *Campylobacter* c) *Vibrio cholera* d) *Salmonella*
28. ,…...Organisms are an index of possible water contamination by pathogens.
a) Viral b) Protozoan c) Indicator d) Bacterial
29. Indicator bacteria should be ……..
a) Pathogenic b) Not enteric c) Quantifiable d) Reproducing
30. The last step of water purification is ……..
a) Chlorination b) Sedimentation c) Flocculation d) Eutrophication
31. Solid material produced from primary treatment of waste water is…….
a) Sludge b) effluent c) Mist d) activated sludge
32. Which of the following waste water treatments is most likely to produce carcinogens as a byproduct?
a) Chlorination b) biological treatment c) UV d) Sedimentation
33. In order to prevent eutrophication of receiving waters, tertiary treatment is used to remove:
a) Sulfate & nitrate b) Phosphate & sulfate c) Nitrate & phosphate d) Excess oxygen
34. Biological treatment of sewage by microorganisms would most likely occur at which stage of waste water treatment……
a) Primary b) Secondary c) Tertiary d) All of these
35. Ozone gas is present at the level of……
a) Troposphere b) Stratosphere c) Mesosphere d) Thermosphere
36. ……. is a liquid particle formed by the atomization of a parent liquid.
a) Smoke b) Mist c) Spray d) Dust
37. ….....is a hazardous air pollutant coming from chloro-alkali manufacture
a) Asbestos b) Arsenic c) Mercury d) Benzene
38. Gases that get into contact with other gases and destroy the ozone layer…….
a) N_2 b) CFCs c) CO d) O_2
39. Phenomenon that includes degradation of pollutants in the presence of other organic matter is known as…….
a) Biodegradation b) co-metabolism c) catabolism d) anabolism

40. All the following are degraded through Co-metabolism except……..
a) Synthetic estrogen b) Mercuric compounds c) Herbicides d) Insecticides
41. The term of microbial cleanup of oil, toxic chemicals, pollutants is known as
a) Co-metabolism b) Biodegradation c) Bioremediation d) all of these
42. $CH3Hg^{+}$ is converted to the relatively nontoxic Hg^{0} by the action of…….
a) MerB b) MerA c) MerT d) all of these
43. ……. is activator protein used in Hg resistance.
a) MerR b) MerP c) MerT d)MerB
44. All of the following is false about bioremediation of Uranium- contaminated environments except
a) Immobile U6+ is formed b) reduction of U6+ c) mobile U4+ is formed d) None of these
45. The most resistant compound to microbial attack is
a) DDT b) 2,4-D c) Trichloroethylene d) 2,4,5-T
46. All the following are examples of Xenobiotics except ……..
a) Synthetic estrogen b) mercuric compounds c) herbicides d) plastics
47. Polyhydroxyalkanoates (PHAs) are produced by……..
a) *Desulfovibrio* sp. b) *Ralstonia sp.* c) *Alcanivorax sp.* d) *Geobacter sp.*
48. …… are Xenobiotic that readily biodegradable polymers.
a) Plastics b) Pesticides c) PHAs d) Fragrances

Q2: Choose the correct answer from the following situations, where

1- Both sentences are correct
2- 1st sentence is correct, while 2nd sentence is false
3- 1st sentence is false, while 2nd sentence is correct
4- Both sentences are incorrect

49. FAME analysis is carried out by *gas chromatography*, Protein analysis is carried by Microarray
a) **(1)** b) **(2)** c) **(3)** d) **(4)**
50. Gas chromatography is only qualitative tool; Mass spectrometry is only quantitative tool
a) **(1)** b) **(2)** c) **(3)** d) **(4)**
51. In PCR, the amplification process is proceed by DNA polymerase, In NASBA, the template RNA is converted to DNA by reverse transcriptase
a) **(1)** b) **(2)** c) **(3)** d) **(4)**
52. PCR is specific tool for detection, ELISA is nonspecific tool for detection
a) **(1)** b) **(2)** c) **(3)** d) **(4)**
53. FISH is protein based technique, ELISA is DNA based technique
a) **(1)** b) **(2)** c) **(3)** d) **(4)**
54. Oxygen-demanding substances creates anaerobic condition**,** Suspended solids promote accelerated eutrophication
a) **(1)** b) **(2)** c) **(3)** d) **(4)**

55. Heat lowers the solubility of oxygen, increases the metabolic activity
a) **(1)** b) **(2)** c) **(3)** d) **(4)**

56. Adenovirus is double-stranded DNA, Astrovirus is single-stranded RNA
a) **(1)** b) **(2)** c) **(3)** d) **(4)**

57. Rotavirus is serious agent for elderly, Norovirus is serious agent for children
a) **(1)** b) **(2)** c) **(3)** d) **(4)**

58. *Shigella* is facultative anaerobic , *Campylobacter* is microaerphilic
a) **(1)** b) **(2)** c) **(3)** d) **(4)**

59. Microaerophilic MOS require reduced oxygen, Capnophilic require reduced carbon dioxide
a) **(1)** b) **(2)** c) **(3)** d) **(4)**

60. *Salmonella* is Gram positive bacteria, *E. coli* is Gram negative bacteria
a) **(1)** b) **(2)** c) **(3)** d) **(4)**

61. Hemolytic uremic syndrome is caused by *Shigella* , Typhoid fever is caused by *Salmonella*
a) **(1)** b) **(2)** c) **(3)** d) **(4)**

62. *V. Cholera* causes severe watery diarrhea , *E.coli* (EHEC) causes highly bloody diarrhea
a) **(1)** b) **(2)** c) **(3)** d) **(4)**

63. Activated sludge is resulted from secondary treatment; Solid sludge is resulted from Tertiary treatment
a) **(1)** b) **(2)** c) **(3)** d) **(4)**

64. Tertiary treatment involves removal of inorganic pollutants**,** removal of non-biodegradable pollutants
a) **(1)** b) **(2)** c) **(3)** d) **(4)**

65. Troposphere is the layer closet to earth's surface; Thermosphere is the outer most layer of atmosphere
a) **(1)** b) **(2)** c) **(3)** d) **(4)**

66. Trihalomethanes (THMs) is produced by dechlorination, methane is produced by methanogens
a) **(1)** b) **(2)** c) **(3)** d) **(4)**

67. $CH3Hg^{+}$ is aquatic pollutant, CH3-Hg-CH3 is atmospheric pollutant
a) **(1)** b) **(2)** c) **(3)** d) **(4)**

68. $CH3Hg^{+}$ is degraded to Hg^{2+} by mercuric reductase, organomercury lyase reduces Hg^{2+} to Hg^{0}
a) **(1)** b) **(2)** c) **(3)** d) **(4)**

69. MerR is a periplasmic Hg^{2+-} binding protein, MerT the membrane transport protein
a) **(1)** b) **(2)** c) **(3)** d) **(4)**

70. Choloroniated compounds are highly toxic, halogenated compounds are less toxic
a) **(1)** b) **(2)** c) **(3)** d) **(4)**

71. Synthetic estrogen is degraded by co-metabolism, Pesticides is degraded by Microorganisms.
a) **(1)** b) **(2)** c) **(3)** d) **(4)**

72. PHAs are non-biodegradable Xenobiotic, DDT is a resistant Xenobiotic to microbial attack
a) **(1)** b) **(2)** c) **(3)** d) **(4)**

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Answer sheet