Registration form

WASTEWATER TREATMENT TRAINING COURSE $100.00
48 HOUR RUSH ORDER PROCESSING FEE ADDITIONAL $50.00

Start and finish dates:____
You will have 90 days from this date in order to complete this course

Name_______________________________**Signature**_______________________________
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Operator ID #______________________________**Exp Date**________________

Please circle/check which certification you are applying the course CEU's.

Collection ☐ Wastewater Treatment ☐ Pretreatment____ Other ____________________

Your certificate will be mailed to you in about two weeks unless you pay for the rush service.

Technical Learning College
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DISCLAIMER NOTICE
I understand that it is my responsibility to ensure that this CEU course is either approved or accepted in my State for CEU credit. I understand State laws and rules change on a frequent basis and I believe this course is currently accepted in my State for CEU or contact hour credit, if it is not, I will not hold Technical Learning College responsible. I also understand that this type of study program deals with dangerous conditions and that I will not hold Technical Learning College, Technical Learning Consultants, Inc. (TLC) liable for any errors or omissions or advice contained in this CEU education training course or for any violation or injury caused by this CEU education training course material. I will call or contact TLC if I need help or assistance and double-check to ensure my registration page and assignment has been received and graded.

State Approval Listing Link, check to see if your State accepts or has pre-approved this course. Not all States are listed. Not all courses are listed. If the course is not accepted for CEU credit, we will give you the course free if you ask your State to accept it for credit.

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You can obtain a printed version of the course manual from TLC for an additional $79.95 plus shipping charges.

AFFIDAVIT OF EXAM COMPLETION
I affirm that I personally completed the entire text of the course. I also affirm that I completed the exam without assistance from any outside source. I understand that it is my responsibility to file or maintain my certificate of completion as required by the state or by the designation organization.

Grading Information
In order to maintain the integrity of our courses we do not distribute test scores, percentages or questions missed. Our exams are based upon pass/fail criteria with the benchmark for successful completion set at 70%. Once you pass the exam, your record will reflect a successful completion and a certificate will be issued to you.

For security purposes, please fax or e-mail a copy of your driver's license and always call us to confirm we've received your assignment and to confirm your identity.

Thank you…

Wastewater Treatment Answer Key   **Name**_____________________________

Phone #_______________________________

Multiple Choice. Pick only one answer per question.
Circle, Mark off, underline or Bold the answer

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Please fax or e-mail the answer key to TLC
Western Campus Fax (928) 272-0747.

Rush Grading Service
If you need this assignment graded and the results mailed to you within a 48-hour period, prepare to pay an additional rush service handling fee of $50.00. This fee may not cover postage costs. If you need this service, simply write RUSH on the top of your Registration Form. We will place you in the front of the grading and processing line.

For security purposes, please fax or e-mail a copy of your driver's license and always call us to confirm we've received your assignment and to confirm your identity.

Thank you…

Please e-mail or fax this survey with your final exam

WASTEWATER TREATMENT CEU COURSE
CUSTOMER SERVICE RESPONSE CARD

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E-MAIL_______________________________PHONE____________________

PLEASE COMPLETE THIS FORM BY CIRCLING THE NUMBER OF THE APPROPRIATE ANSWER IN THE AREA BELOW.

1. Please rate the difficulty of your course.
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2. Please rate the difficulty of the testing process.
   Very Easy 0 1 2 3 4 5 Very Difficult

3. Please rate the subject matter on the exam to your actual field or work.
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How about the price of the course?

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Wastewater Treatment CEU Training Course Assignment

Your assignment is to correctly answer the following questions about the characteristic of the activated sludge process.

You will have 90 days in order to successfully complete this assignment with a score of 70% or better. If you need any assistance, please contact TLC's Student Services. Once you are finished, please, e-mail or fax or e-mail your answer sheet along with your registration form.

Please use the Answer Key and Registration form. Select the exact answer from text.

1. The Clean Water Act is a 1977 amendment to the _________, which set the basic structure for regulating discharges of pollutants to waters of the United States.
A. 1977 amendments
B. Clean Water Act
C. NPDES
D. Federal Water Pollution Control Act of 1972
E. None of the Above

2. The law gave the _________ the authority to set effluent standards on an industry basis (technology-based) and continued the requirements to set water quality standards for all contaminants in surface waters.
A. 1977 amendments
B. Clean Water Act
C. EPA
D. National clean water legislation
E. None of the Above

3. The CWA makes it unlawful for any person to discharge any pollutant from a point source into navigable waters unless a permit _________is obtained under the Act.
A. 1977 amendments
B. Clean Water Act
C. NPDES
D. National clean water legislation
E. None of the Above

4. The _________focused on toxic pollutants.
A. 1977 amendments
B. Clean Water Act
C. NPDES
D. National clean water legislation
E. None of the Above

5. In 1987, the _________ was reauthorized and again focused on toxic substances, authorized citizen suit provisions, and funded sewage treatment plants (**POTW's**) under the Construction Grants Program.
A. 1977 amendments
B. Clean Water Act also called PCA
C. NPDES
D. National clean water legislation
E. None of the Above

6. The _________ provides for the delegation by the EPA of many permitting, administrative, and enforcement aspects of the law to state governments.
A. 1977 amendments
B. Clean Water Act
C. NPDES
D. National clean water legislation
E. None of the Above

7. In states with the authority to implement _________ programs, the EPA still retains oversight responsibilities.
A. 1977 amendments
B. Clean Water Act
C. NPDES
D. National clean water legislation
E. None of the Above

8. In 1972, Congress enacted the first comprehensive _________in response to growing public concern for serious and widespread water pollution.
A. 1977 amendments
B. Clean Water Act
C. NPDES
D. National clean water legislation
E. None of the Above

9. The _________is the primary federal law that protects our nation's waters, including lakes, rivers, aquifers and coastal areas.
A. 1977 amendments
B. Clean Water Act
C. NPDES
D. National clean water legislation
E. None of the Above

10. The _________ focuses on improving the quality of the nation's waters.
A. 1977 amendments
B. Clean Water Act
C. NPDES
D. National clean water legislation
E. None of the Above

11. The Clean Water Act provides a comprehensive framework of standards, technical tools and financial assistance to address the many causes of pollution and _________, including municipal and industrial wastewater discharges, polluted runoff from urban and rural areas, and habitat destruction.
A. 1977 amendments
B. Clean Water Act
C. NPDES
D. Poor water quality
E. None of the Above

12. The Clean Water Act requires major industries to meet performance standards to ensure pollution control; charges states and tribes with _________criteria appropriate for their waters and developing pollution control programs to meet them.
A. 1977 amendments
B. Clean Water Act
C. NPDES
D. Setting specific water quality
E. None of the Above

13. The Clean Water Act provides funding to states and communities to help them meet their clean _________; and protects valuable wetlands and other aquatic habitats through a permitting process that ensures development and other activities are conducted in an environmentally sound manner.
A. 1977 amendments
B. Clean Water Act
C. NPDES
D. Water infrastructure needs
E. None of the Above

14. The _________continues to provide a clear path for clean water and a solid foundation for an effective national water program.
A. 1977 amendments
B. Clean Water Act
C. NPDES
D. Effective national water program
E. None of the Above

15. There are two basic stages in the treatment of _________, primary and secondary.
A. Organisms
B. Primary
C. Water
D. Wastewater
E. None of the Above

16. In the _________ stage, solids are allowed to settle and are removed from wastewater. The secondary stage uses biological processes to further purify wastewater. Sometimes, these stages are combined into one operation.
A. Organisms
B. Primary
C. Water
D. Wastewater
E. None of the Above

17. Wastewater is mostly _________ by weight. Other materials make up only a small portion of wastewater, but can be present in large enough quantities to endanger public health and the environment.
A. Organisms
B. Primary
C. Water
D. Wastewater
E. None of the Above

18. Because practically anything that can be flushed down a toilet, drain, or sewer can be found in _________, even household sewage contains many potential pollutants.
A. Organisms
B. Primary
C. Water
D. Wastewater
E. None of the Above

19. Many different types of _________ live in wastewater and some are essential contributors to treatment.
A. Organisms
B. Primary
C. Water
D. Wastewater
E. None of the Above

20. A variety of bacteria, _________, and worms work to break down certain carbon-based (organic) pollutants in wastewater by consuming them.
A. Organisms
B. Primary
C. Water
D. Wastewater
E. None of the Above

21. _________ turn wastes into carbon dioxide, water, or new cell growth.
A. Organisms
B. Primary
C. Water
D. Wastewater
E. None of the Above

22. Bacteria and other microorganisms are particularly plentiful in _________ and accomplish most of the treatment.
A. Organisms
B. Primary
C. Water
D. Wastewater
E. None of the Above

23. Most _________ treatment systems are designed to rely in large part on biological processes.
A. Organisms
B. Primary
C. Water
D. Wastewater
E. None of the Above

24. Many disease-causing viruses, _________, and bacteria also are present in wastewater and enter from almost anywhere in the community. These pathogens often originate from people and animals who are infected with or are carriers of a disease.
A. Gastroenteritis
B. Pathogens
C. Diseases
D. Parasites
E. None of the Above

25. Graywater and blackwater from typical homes contain enough pathogens to pose a risk to _________. Other likely sources in communities include hospitals, schools, farms, and food processing plants.
A. Gastroenteritis
B. Pathogens
C. Diseases
D. Parasites
E. None of the Above

26. Gastroenteritis can result from a variety of _________ in wastewater, and cases of illnesses caused by the parasitic protozoa Giardia lambia and Cryptosporidium are not unusual in the U.S.
A. Gastroenteritis
B. Pathogens
C. Diseases
D. Parasites
E. None of the Above

27. Other important wastewater-related _________ include hepatitis A, typhoid, polio, cholera, and dysentery. Outbreaks of these diseases can occur as a result of drinking water from wells polluted by wastewater, eating contaminated fish, or recreational activities in polluted waters.
A. Gastroenteritis
B. Pathogens
C. Diseases
D. Parasites
E. None of the Above

28. _________are found everywhere in the environment. They are composed of the carbon-based chemicals that are the building blocks of most living things.
A. Gastroenteritis
B. Pathogens
C. Diseases
D. Parasites
E. None of the Above

29. Organic materials in wastewater originate from plants, animals, or _________, and enter wastewater through human wastes, paper products, detergents, cosmetics, foods, and from agricultural, commercial, and industrial sources.
A. Gastroenteritis
B. Pathogens
C. Diseases
D. Parasites
E. None of the Above

30. _________normally are some combination of carbon, hydrogen, oxygen, nitrogen, and other elements. Many organics are proteins, carbohydrates, or fats and are biodegradable, which means they can be consumed and broken down by organisms.
A. Proteins
B. Organic matter or organic compounds or organic materials
C. Synthetic organics
D. BOD
E. None of the Above

31. Too much _________in wastewater can be devastating to receiving waters.
A. Proteins
B. Organic matter or organic compounds or organic materials
C. Synthetic organics
D. BOD
E. None of the Above

32. Large amounts of biodegradable materials are dangerous to lakes, streams, and oceans, because organisms use _________in the water to break down the wastes.
A. Proteins
B. Organic matter or organic compounds or organic materials
C. Synthetic organics
D. DO
E. None of the Above

33. Some organic compounds are more stable than others and cannot be quickly broken down by organisms, posing an additional challenge for treatment. This is true of many _________compounds developed for agriculture and industry.
A. Proteins
B. Organic matter or organic compounds or organic materials
C. Synthetic organic
D. BOD
E. None of the Above

34. Certain _________are highly toxic.
A. Proteins
B. Organic matter or organic compounds or organic materials
C. Synthetic organics
D. BOD
E. None of the Above

35. Benzene and toluene are two_________ found in some solvents, pesticides, and other products.
A. Proteins
B. Toxic organic compounds
C. Synthetic organics
D. BOD
E. None of the Above

36. New _________compounds are being developed all the time, which can complicate treatment efforts.
A. Proteins
B. Organic matter or organic compounds or organic materials
C. Synthetic organic
D. BOD
E. None of the Above

37. Fatty organic materials from animals, vegetables, and petroleum also are not quickly broken down by _________ and can cause pollution in receiving environments.
A. Proteins
B. Organic matter or organic compounds or organic materials
C. Synthetic organics
D. Bacteria
E. None of the Above

38. When large amounts of oils and greases are discharged to receiving waters from community systems, they increase _________ and they may float to the surface and harden, causing aesthetically unpleasing conditions.
A. Proteins
B. Organic matter or organic compounds or organic materials
C. Synthetic organics
D. BOD
E. None of the Above

39. _________also can trap trash, plants, and other materials, causing foul odors and attracting flies and mosquitoes and other disease vectors. In some cases, too much oil and grease causes septic conditions in ponds and lakes by preventing oxygen from the atmosphere from reaching the water.
A. Inorganic minerals
B. Inorganic substances
C. Oils and greases
D. Petroleum-based waste oils
E. None of the Above

40. Onsite systems also can be harmed by too much _________, which can clog onsite system drainfield pipes and soils, adding to the risk of system failure.
A. Inorganic minerals
B. Inorganic substances
C. Oils and grease
D. Petroleum-based waste oils
E. None of the Above

41. Excessive _________ also adds to the septic tank scum layer, causing more frequent tank pumping to be required. Both possibilities can result in significant costs to homeowners.
A. Inorganic minerals
B. Inorganic substances
C. Grease
D. Petroleum-based waste oils
E. None of the Above

42. _________used for motors and industry are considered hazardous waste and should be collected and disposed of separately from wastewater.
A. Inorganic minerals
B. Inorganic substances
C. Oils and greases
D. Petroleum-based waste oils
E. None of the Above

43. _________, metals, and compounds, such as sodium, potassium, calcium, magnesium, cadmium, copper, lead, nickel, and zinc are common in wastewater from both residential and nonresidential sources.
A. Inorganic minerals
B. Inorganic substances
C. Oils and greases
D. Petroleum-based waste oils
E. None of the Above

44. They can originate from a variety of sources in the community including industrial and commercial sources, _________, and inflow and infiltration from cracked pipes and leaky manhole covers.
A. Inorganic minerals
B. Inorganic substances
C. Oils and greases
D. Stormwater
E. None of the Above

45. Most _________are relatively stable, and cannot be broken down easily by organisms in wastewater.
A. Inorganic minerals
B. Inorganic substances
C. Oils and greases
D. Petroleum-based waste oils
E. None of the Above

46. Large amounts of many _________ can contaminate soil and water. Some are toxic to animals and humans and may accumulate in the environment. For this reason, extra treatment steps are often required to remove inorganic materials from industrial wastewater sources.
A. Inorganic minerals
B. Inorganic substances
C. Oils and greases
D. Petroleum-based waste oils
E. None of the Above

47. Heavy metals are discharged with many types of industrial wastewaters, are difficult to remove by _________.
A. Solid materials
B. Nitrogen
C. Nutrients
D. Deprived of oxygen
E. None of the Above

48. Although acute poisonings from heavy metals in drinking water are rare in the U.S., potential long-term health effects of ingesting small amounts of some _________over an extended period of time are possible.
A. Solid materials
B. Nitrogen
C. Nutrients
D. Deprived of oxygen
E. None of the Above

49. Wastewater often contains large amounts of the _________ nitrogen and phosphorus in the form of nitrate and phosphate, which promote plant growth.
A. Solid materials
B. Nitrogen
C. Nutrients
D. Deprived of oxygen
E. None of the Above

50. Organisms only require small amounts of nutrients in biological treatment, so there normally is an excess available in treated wastewater. In severe cases, excessive _________ in receiving waters cause algae and other plants to grow quickly depleting oxygen in the water.
A. Solid materials
B. Nitrogen
C. Nutrients
D. Deprived of oxygen
E. None of the Above

51. _________, fish and other aquatic life die, emitting foul odors.
A. Solid materials
B. Nitrogen
C. Nutrients
D. Deprived of oxygen
E. None of the Above

52. _________ from wastewater have also been linked to ocean "red tides" that poison fish and cause illness in humans.
A. Solid materials
B. Nitrogen
C. Nutrients
D. Deprived of oxygen
E. None of the Above

53. _________ in drinking water may contribute to miscarriages and is the cause of a serious illness in infants called methemoglobinemia or "blue baby syndrome."
A. Solid materials
B. Nitrogen
C. Nutrients
D. Deprived of oxygen
E. None of the Above

54. _________in wastewater can consist of organic and/or inorganic materials and organisms.
A. Solid materials
B. Nitrogen
C. Nutrients
D. Deprived of oxygen
E. None of the Above

55. The solids must be significantly reduced by treatment or they can increase BOD when discharged to receiving waters and provide places for _________ to escape disinfection. They also can clog soil absorption fields in onsite systems.
A. Solid materials
B. Nitrogen
C. Nutrients
D. Deprived of oxygen
E. None of the Above

56. What are certain substances, such as sand, grit, and heavier organic and inorganic materials settle out from the rest of the wastewater stream during the preliminary stages of treatment?
A. Suspended solids
B. Settleable solids
C. Biologically active layer
D. Dissolved solids
E. None of the Above

57. On the bottom of settling tanks and ponds, organic material makes up a _________of sludge that aids in treatment.
A. Suspended solids
B. Settleable solids
C. Biologically active layer
D. Dissolved solids
E. None of the Above

58. What are materials that resist settling may remain suspended in wastewater?
A. Suspended solids
B. Settleable solids
C. Biologically active layer
D. Dissolved solids
E. None of the Above

59. _________in wastewater must be treated, or they will clog soil absorption systems or reduce the effectiveness of disinfection systems.
A. Suspended solids
B. Settleable solids
C. Biologically active layer
D. Dissolved solids
E. None of the Above

60. What are small particles of certain wastewater materials can dissolve like salt in water?
A. Suspended solids
B. Settleable solids
C. Biologically active layer
D. Dissolved solids
E. None of the Above

61. Some dissolved materials are consumed by microorganisms in wastewater, but others, such as heavy metals, are difficult to remove by conventional treatment. Excessive amounts of _________ in wastewater can have adverse effects on the environment.
A. Suspended solids
B. Settleable solids
C. Biologically active layer
D. Dissolved solids
E. None of the Above

62. Certain gases in wastewater can cause _________, affect treatment, or are potentially dangerous.
A. Suspended solids
B. Settleable solids
C. Biologically active layer
D. None of the Above

63. _________is a byproduct of anaerobic biological treatment and is highly combustible.
A. Hydrogen sulfide
B. Methane gas
C. Wastewater odors
D. Ammonia
E. None of the Above

64. Special precautions need to be taken near septic tanks, manholes, treatment plants, and other areas where _________can collect.
A. Hydrogen sulfide
B. Methane gas
C. Wastewater gases
D. Ammonia
E. None of the Above

65. The gases _________and ammonia can be toxic and pose asphyxiation hazards.
A. Hydrogen sulfide
B. Methane gas
C. Wastewater odors
D. Ammonia
E. None of the Above

66. _________ as a dissolved gas in wastewater also is dangerous to fish.
A. Hydrogen sulfide
B. Methane gas
C. Wastewater odors
D. Ammonia
E. Substances

67. Unless effectively contained or minimized by design and location, _________can affect the mental well-being and quality of life of residents. In some cases, odors can even lower property values and affect the local economy.
A. Hydrogen sulfide
B. Methane gas
C. Wastewater odors
D. Ammonia
E. None of the Above

68. In addition to the many _________ found in wastewater, there are other characteristics system designers and operators use to evaluate wastewater.
A. Temperatures
B. Turbidity
C. Alkalinity
D. pH
E. None of the Above

69. The color, odor, and _________ of wastewater give clues about the amount and type of pollutants present and treatment necessary.
A. Temperatures
B. Turbidity
C. Alkalinity
D. pH
E. None of the Above

70. The following are some other important wastewater characteristics that can affect public health and the environment, as well as the _________, cost, and effectiveness of treatment.
A. Temperatures
B. Turbidity
C. Alkalinity
D. pH
E. None of the Above

71. The best temperatures for wastewater treatment probably range from 77 to 95 degrees Fahrenheit. In general, biological treatment activity accelerates in warm _________ and slows in cool temperatures, but extreme hot or cold can stop treatment processes altogether.
A. Temperatures
B. Turbidity
C. Alkalinity
D. pH
E. None of the Above

72. Some systems are _________during cold weather and some may not be appropriate for very cold climates.
A. Temperatures
B. Turbidity
C. Alkalinity
D. pH
E. None of the Above

73. Wastewater _________ also affects receiving waters. Hot water is a byproduct of many manufacturing processes, can be a pollutant.
A. Temperature
B. Turbidity
C. Alkalinity
D. pH
E. None of the Above

74. When hot water is discharged in large quantities, it can raise the _________ of receiving streams locally and disrupt the natural balance of aquatic life.
A. Temperature
B. Turbidity
C. Alkalinity
D. pH
E. None of the Above

75. The _________ or alkalinity of wastewater affects both treatment and the environment.
A. Temperatures
B. Acidity
C. Alkalinity
D. pH
E. None of the Above

76. Low _________ indicates increasing acidity, while a high pH indicates increasing alkalinity (a pH of 7 is neutral).
A. Temperatures
B. Acid
C. Alkalinity
D. pH

77. The _________ of wastewater needs to remain between 6 and 9 to protect organisms.
A. Temperatures
B. Acid
C. Alkalinity
D. pH
E. None of the Above

78. Acids and other substances that alter _________ can inactivate treatment processes when they enter wastewater from industrial or commercial sources.
A. Temperatures
B. Acid
C. Alkalinity
D. pH
E. None of the Above

79. Whether a system serves a single home or an entire community, it must be able to _________ in the quantity and quality of wastewater it receives to ensure proper treatment is provided at all times.
A. Hydraulically overloaded
B. Based on observations
C. Handle fluctuations
D. Flows generated
E. None of the Above

80. Systems that are inadequately designed or _________may fail to provide treatment and allow the release of pollutants to the environment.
A. Hydraulically overloaded
B. Based on observations
C. Handle fluctuations
D. Flows generated
E. None of the Above

81. To design systems that are both as safe and as cost-effective as possible, engineers must estimate the average and maximum (peak) amount of _________by various sources.
A. Hydraulically overloaded
B. Based on observations
C. Handle fluctuations
D. Flows generated
E. None of the Above

82. Because extreme fluctuations in flow can occur during different times of the day and on different days of the week, estimates are _________of the minimum and maximum amounts of water used on an hourly, daily, weekly, and seasonal basis.
A. Hydraulically overloaded
B. Based on observations
C. Handle fluctuations
D. Flows generated
E. None of the Above

83. The _________ peak flow events that result from several or all water-using appliances or fixtures being used at once also is taken into account.
A. Hydraulically overloaded
B. Based on observations
C. Flows generated
D. Possibility of instantaneous
E. None of the Above

84. Peak flows at stores and other businesses _________ business hours and during meal times at restaurants.
A. Hydraulically overloaded
B. Typically occur during
C. Handle fluctuations
D. Flows generated
E. None of the Above

85. _________ for centralized treatment systems is a complicated task, especially when designing a new treatment plant in a community where one has never existed previously.
A. Hydraulically overloaded
B. Estimating flow volumes
C. Handle fluctuations
D. Flows generated
E. None of the Above

86. Engineers must allow for additional flows during wet weather due to _________ of extra water into sewers.
A. Hydraulically overloaded
B. Inflow and infiltration
C. Flows generated
D. Possibility of instantaneous
E. None of the Above

87. Excess water can enter sewers through leaky manhole covers and cracked pipes and pipe joints, diluting wastewater, which affects its overall characteristics. This _________ to treatment plants sometimes by as much as three or four times the original design load.
A. Hydraulically overloaded
B. Can increase flows
C. Handle fluctuations
D. Flows generated
E. None of the Above

88. The main focus of wastewater treatment plants __________the BOD and COD in the effluent discharged to natural waters, meeting state and federal discharge criteria.
A. Is to reduce
B. Bioconversion of
C. Are designed to
D. To remove
E. None of the Above

89. Wastewater treatment plants __________function as "microbiology farms," where bacteria and other microorganisms are fed oxygen and organic waste.
A. Is to reduce
B. Bioconversion of
C. Are designed to
D. To remove
E. None of the Above

90. Treatment of wastewater usually involves biological processes such as the activated sludge system in the secondary stage after preliminary screening __________coarse particles and primary sedimentation that settles out suspended solids.
A. Is to reduce
B. Bioconversion of
C. Are designed to
D. To remove
E. None of the Above

91. These secondary treatment steps are __________ environmental biotechnologies that harness natural self-purification processes contained in bioreactors for the biodegradation of organic matter and bioconversion of soluble nutrients in the wastewater.
A. Is to reduce
B. Bioconversion of
C. Are designed to
D. Generally considered
E. None of the Above

92. Each wastewater stream is unique, and so too are the community of microorganisms that process it. This "application-specific microbiology" is the preferred methodology in wastewater treatment__________ of biological nutrient removal.
A. Is to reduce
B. Bioconversion of
C. Affecting the efficiency
D. To remove
E. None of the Above

93. The right laboratory-prepared bugs __________ in organics removal-if they have the right growth environment. This efficiency is multiplied if microorganisms are allowed to grow as a layer-a biofilm-on specifically designed support media. In this way, optimized biological processing of a waste stream can occur.
A. Are more efficient
B. Bioconversion of
C. Are designed to
D. To remove
E. None of the Above

94. To reduce the start up phase for growing a __________one can also purchase "application specific bacterial cultures" from appropriate microbiology vendors.
A. Biological denitrification
B. Microbes feed
C. Micro-organisms
D. Mature biofilm
E. None of the Above

95. __________, like all living things, require food for growth.
A. Aerobic digestion
B. Biological denitrification
C. Microbes feed
D. Micro-organisms
E. None of the Above

96. Biological sewage treatment consists of many different __________, mostly bacteria, carrying out a stepwise, continuous, sequential attack on the organic compounds found in wastewater and upon which the microbes feed.
A. Aerobic digestion
B. Biological denitrification
C. Microbes feed
D. Micro-organisms
E. None of the Above

97. __________of waste is the natural biological degradation and purification process in which bacteria that thrive in oxygen-rich environments break down and digest the waste.
A. Aerobic digestion
B. Biological denitrification
C. Micro-organisms
D. Mature biofilm
E. None of the Above

98. During the oxidation process, pollutants are broken down into carbon dioxide (CO_2), water (H_2O), nitrates, sulfates and biomass (__________). By optimizing the oxygen supply -with so-called aerators- the process can be significantly accelerated.
A. Aerobic digestion
B. Biological denitrification
C. Micro-organisms
D. Mature biofilm
E. None of the Above

99. Most activated sludge processes are used to degrade carbonaceous BOD. It is also possible to design and/or operate the basic system to oxidize ammonia (__________).
A. Aerobic digestion
B. Nitrification
C. Microbes feed
D. Micro-organisms
E. None of the Above

100. Many plants are now designed to achieve __________. Other system modifications include phosphorus removal and biological denitrification. Activated sludge plants are usually designed from pilot plant and laboratory studies.
A. Aerobic digestion
B. Nitrification
C. Micro-organisms
D. Mature biofilm
E. None of the Above

101. It is possible to design a process based on the amount of time the __________ spends in the system, generally termed mean cell residence time (MCRT), or on the amount of food provided to the bacteria in the aeration tank (the food-to-microorganism ratio, F/M).
A. Aerobic digestion
B. Biological denitrification
C. Microbes feed
D. Sludge
E. None of the Above

102. The operating control point is that point when the best effluent and __________ quality is obtained for the existing conditions.
A. Aerobic digestion
B. Biological denitrification
C. Microbes feed
D. Sludge
E. None of the Above

103. Swimming and gliding ____________ engulf bacteria or other prey.
A. Ciliates
B. Microorganism or Organism
C. Bacteria
D. Floc-forming bacteria
E. None of the Above

104. Stalked ____________ attach to the biomass and vortex suspended bacteria into their gullets, while crawlers break bacteria loose from the floc surface.
A. Ciliates
B. Microorganism or Organism
C. Bacteria
D. Floc-forming bacteria
E. None of the Above

105. Predators feed mostly on stalked and swimming ciliates. The omnivores, such as most rotifers, eat whatever is readily available, while the worms feed on the floc or prey on larger organisms. ____________ are directly affected by their treatment environment.
A. Ciliates
B. Microorganisms
C. Bacteria
D. Floc-forming bacteria
E. None of the Above

106. Changes in food, dissolved oxygen, temperature, pH, total dissolved solids, sludge age, presence of toxins, and other factors create a dynamic environment for the treatment ____________.
A. Ciliates
B. Organisms
C. Bacteria
D. Floc-forming bacteria
E. None of the Above

107. Food (organic loading) regulates ____________ numbers, diversity, and species when other factors are not limiting.
A. Ciliates
B. Microorganism
C. Bacteria
D. Floc-forming bacteria
E. None of the Above

108. The relative abundance and occurrence of organisms at different loadings can reveal why some ____________ are present in large numbers while others are absent.
A. Ciliates
B. Organisms
C. Bacteria
D. Floc-forming bacteria
E. None of the Above

109. The aerobic bacteria that occur are similar to those found in other treatment processes such as ____________.
A. Ciliates
B. Microorganism or Organism
C. Bacteria
D. Floc-forming bacteria
E. None of the Above

110. Three functional groups occur: freely dispersed, single bacteria; ____________; and filamentous bacteria. All function similarly to oxidize organic carbon (BOD) to produce CO2 and new bacteria (new sludge).
A. Ciliates
B. Microorganism or Organism
C. Bacteria
D. Floc-forming bacteria
E. None of the Above

111. Many bacterial species that degrade wastes grow as single bacteria dispersed in the wastewater. Although these readily oxidize BOD, they do not settle and hence often leave the lagoon system in the effluent as solids (____________).
A. Filamentous
B. TSS
C. Floc
D. BOD
E. None of the Above

112. These tend to grow in lagoons at high organic loading and low oxygen conditions. More important are the floc-forming bacteria, those that grow in a large aggregate (____________) due to exocellular polymer production (the glycocalyx).
A. Filamentous
B. Heterotrophic
C. TSS
D. Floc
E. None of the Above

113. This growth form is important as these flocs degrade BOD and settle at the end of the process, producing a low ____________ effluent.
A. Filamentous
B. Heterotrophic
C. TSS
D. BOD
E. None of the Above

114. A number of ____________ bacteria occur in lagoons, usually at specific growth environments.
A. Filamentous
B. Heterotrophic
C. TSS
D. Nitrification
E. None of the Above

115. These generally do not cause any operational problems in lagoons, in contrast to activated sludge where ____________ bulking and poor sludge settling is a common problem.
A. Filamentous
B. Heterotrophic
C. TSS
D. Nitrification
E. None of the Above

116. Most heterotrophic bacteria have a wide range in environmental tolerance and can function effectively in ____________ removal over a wide range in pH and temperature.
A. Filamentous
B. Heterotrophic
C. TSS
D. Nitrification
E. None of the Above

117. Aerobic ____________ removal generally proceeds well from pH 6.5 to 9.0 and at temperatures from 3-4^{o}C to 60- 70°C (mesophilic bacteria are replaced by thermophilic bacteria at temperatures above 35°C).
A. Filamentous
B. TSS
C. Nitrification
D. BOD
E. None of the Above

118. BOD removal generally declines rapidly below 3-4°C and ceases at 1-2°C.A very specialized group of bacteria occurs to some extent in lagoons (and other wastewater treatment systems) that can oxidize ammonia via nitrite to nitrate, termed____________.
A. Filamentous
B. Heterotrophic
C. Nitrifying bacteria
D. Nitrification
E. None of the Above

119. It was once thought that only two bacteria were involved in nitrification: Nitrosomonas europaea, which oxidizes ammonia to nitrite, and Nitrobacter winogradskyi, which ____________to nitrate.
A. Filamentous
B. Heterotrophic
C. Oxidize nitrite
D. Nitrification
E. None of the Above

120. It is now known that at least 5 genera of bacteria ____________and at least three genera of bacteria oxidize nitrite.
A. CO_2
B. Heterotrophic
C. Oxidize ammonia
D. Nitrification
E. None of the Above

121. Besides oxygen, these nitrifying bacteria require a neutral pH (7-8) and substantial alkalinity (these autotrophs use ____________ as a carbon source for growth).
A. CO_2
B. MLSS
C. Oxidize nitrite
D. Nitrification
E. None of the Above

122. ____________ ceases at pH values above 9 and declines markedly at pH values below 7. This results from the growth inhibition of the nitrifying bacteria.
A. CO_2
B. Heterotrophic
C. Oxidize nitrite
D. Nitrification
E. None of the Above

123. ____________, is not a major pathway for nitrogen removal in lagoons.
A. CO_2
B. MLSS
C. Oxidize nitrite
D. Nitrification
E. None of the Above

124. Nitrifying bacteria exist in low numbers in lagoons. They prefer attached growth systems and/or high ____________ sludge systems.
A. CO_2
B. MLSS
C. Oxidize nitrite
D. Nitrification
E. None of the Above

125. Anaerobic, heterotrophic bacteria that commonly occur in lagoons are involved in __________ formation and in sulfate reduction.
A. CO_2
B. MLSS
C. Methane
D. Nitrification
E. None of the Above

126. Anaerobic methane formation involves three different groups of anaerobic bacteria that function together to convert organic materials to ____________ via a three step process.
A. CO_2
B. MLSS
C. Methane
D. Nitrification
E. None of the Above

127. ____________ - many genera of anaerobic bacteria hydrolyze proteins, fats, and poly saccharides present in wastewater to amino acids, short-chain peptides, fatty acids, glycerol, and mono- and di-saccharides. These have a wide environmental tolerance in pH and temperature.
A. Methane forming bacteria
B. General anaerobic degraders
C. Acid-forming bacteria
D. Anaerobic fermenter
E. None of the Above

128. ____________ - this diverse group of bacteria converts products from above under anaerobic conditions to simple alcohols and organic acids such as acetic, propionic, and butyric. These bacteria are hardy and occur over a wide pH and temperature range.
A. Methane forming bacteria
B. Anaerobic degraders
C. Acid-forming bacteria
D. Anaerobic fermenter
E. None of the Above

129. ____________ - these bacteria convert formic acid, methanol, methylamine, and acetic acid under anaerobic conditions to methane.
A. Methane forming bacteria
B. Anaerobic degraders
C. Acid-forming bacteria
D. Anaerobic fermenter
E. None of the Above

130. ____________ is derived in part from these compounds and in part from CO_2 reduction.
A. Methane
B. Anaerobic degraders
C. Acid-forming bacteria
D. Anaerobic fermenter
E. None of the Above

131. ____________ are environmentally sensitive and have a narrow pH range of 6.5- 7.5 and require temperatures > 14^o C.
A. Methane bacteria
B. Anaerobic degraders
C. Acid-forming bacteria
D. Anaerobic fermenter
E. None of the Above

132. Note that the products of the acid formers (principally acetic acid) become the substrate for the ____________.
A. Methane producers
B. Anaerobic degraders
C. Acid-forming bacteria
D. Anaerobic fermenter
E. None of the Above

133. A problem at times exists where the acid formers overproduce organic acids, lowering the pH below where the ____________ can function (a pH < 6.5). This can stop methane formation and lead to a buildup of sludge in a lagoon with a low pH.
A. Methane bacteria
B. Anaerobic degraders
C. Acid-forming bacteria
D. Anaerobic fermenter
E. None of the Above

134. In an ____________, this is called a **"stuck digester"**.
A. Methane forming bacteria
B. Anaerobic degraders
C. Acid-forming bacteria
D. Anaerobic fermenter
E. None of the Above

135. ____________ ceases at cold temperatures, probably not occurring in most lagoons in the wintertime in cold climates.
A. Methane fermentation
B. Anaerobic degraders
C. Acid-forming bacteria
D. Anaerobic fermenter
E. None of the Above

136. A number of ____________ (14 genera reported to date) called sulfate reducing bacteria can use sulfate as an electron acceptor, reducing sulfate to hydrogen sulfide. This occurs when BOD and sulfate are present and oxygen is absent.
A. Methane forming bacteria
B. Anaerobic bacteria
C. Acid-forming bacteria
D. Anaerobic fermenter
E. None of the Above

137. ____________is a major cause of odors in ponds.
A. Sulfur compounds
B. Sulfate reduction
C. H_2S
D. Sulfur bacteria
E. None of the Above

138. Anaerobic, photosynthetic bacteria occur in all lagoons and are the predominant photo-synthetic organisms in anaerobic lagoons. The anaerobic sulfur bacteria, generally grouped into the red and green sulfur bacteria and represented by about 28 genera, oxidize reduced sulfur compounds (____________) using light energy to produce sulfur and sulfate.
A. Sulfur compounds
B. Sulfate reduction
C. H_2S
D. Sulfur bacteria
E. None of the Above

139. ____________ is used in place of H_2O as used by algae and green plants, producing $S0_4$- instead of O_2. All are either strict anaerobes or microaerophilic. Most common are Chromatium, Thiocystis, and Thiopedia, which can grow in profusion and give a lagoon a pink or red color.
A. Sulfur compounds
B. Sulfate reduction
C. H_2S
D. Sulfur bacteria
E. None of the Above

140. Conversion of odorous sulfides to sulfur and sulfate by these ____________is a significant odor control mechanism in facultative and anaerobic lagoons, and can be desirable.
A. Sulfur compounds
B. Sulfate reduction
C. H_2S
D. Sulfur bacteria
E. None of the Above

141. The ____________ at a treatment lagoon is determined by the various chemical species of alkalinity that are present.
A. Sulfur compounds
B. Sulfate reduction
C. H_2S
D. Sulfur bacteria
E. None of the Above

142. The main species present are carbon dioxide (CO_2, bicarbonate ion (____________), and carbonate ion (CO_3=).
A. Alkalinity
B. HCO_3
C. H_2S
D. pH
E. None of the Above

143. ____________ and pH can affect which species will be present. High amounts of CO_2 yield a low lagoon pH, while high amounts of CO_3= yield a high lagoon pH.
A. Alkalinity
B. CO_2
C. H_2S
D. pH
E. None of the Above

144. Bacterial growth on ____________ releases CO_2 which subsequently dissolves in water to yield carbonic acid (H_2CO_3). This rapidly dissociates to bicarbonate ion, increasing the lagoon alkalinity.
A. Alkalinity
B. BOD
C. H_2S
D. pH
E. None of the Above

145. Bacterial oxidation of BOD causes a decrease in lagoon pH due to ____________ release.
A. Alkalinity
B. CO_2
C. H_2S
D. pH
E. None of the Above

146. Algal growth in lagoons has the opposite effect on lagoon pH, raising the pH due to algal use for growth of inorganic carbon (____________ and HCO_3).
A. Alkalinity
B. CO_2
C. H_2S
D. pH
E. None of the Above

147. Algal growth reduces the lagoon alkalinity which may cause the ____________ to increase if the lagoon alkalinity (pH buffer capacity) is low.
A. Alkalinity
B. CO_2
C. H_2S
D. pH
E. None of the Above

148. ____________ can grow to such an extent in lagoons (a bloom) that they consume for photosynthesis all of the CO_2 and HCO3-present, leaving only carbonate (CO_3=) as the pH buffering species.
A. Alkalinity
B. CO_3
C. Algae
D. pH
E. None of the Above

149. The above situation causes the pH of the lagoon to become ____________.
A. Alkaline
B. CO_2
C. H_2S
D. pH
E. None of the Above

150. pH values of 9.5 or greater are common in ____________ during algal blooms, which can lead to lagoon effluent pH violations (in most states this is pH = 9).
A. Culex tarsalis
B. Lagoon (s)
C. Rotifers
D. Microinvertebrates

151. It should be noted that an increase in the____________ pH caused by algal growth can be beneficial. Natural disinfection of pathogens is enhanced at higher pH.
A. Culex tarsalis
B. Lagoon (s)
C. Rotifers
D. Microinvertebrates
E. None of the Above

152. Phosphorus removal by natural chemical precipitation is greatly enhanced at pH values greater than pH = 8.5. In addition, ____________to the atmosphere is enhanced at higher pH values (NH_3 is strippable, not NH_4+).
A. Culex tarsalis
B. Lagoon (s)
C. Rotifers
D. Microinvertebrates
E. None of the Above

153. Many higher life forms (animals) develop in lagoons. These include protozoans and microinvertebrates such as rotifers, daphnia, ____________, chironomids (midge larvae), and mosquito larvae (often termed zooplankton).
A. Annelids
B. Lagoon (s)
C. Rotifers
D. Microinvertebrates
E. None of the Above

154. These organisms mentioned above play a role in waste purification by feeding on bacteria and ____________ and promoting flocculation and settling of particulate material.
A. Culex tarsalis
B. Lagoon (s)
C. Algae
D. Microinvertebrates
E. None of the Above

155. Protozoans are the most common higher life forms in ____________, with about 250 species identified in lagoons to date.
A. Culex tarsalis
B. Lagoon (s)
C. Rotifers
D. Microinvertebrates
E. None of the Above

156. ____________ and daphnia are particularly important in controlling algal overgrowth and these often **"bloom"** when algal concentrations are high.
A. Culex tarsalis
B. Lagoon (s)
C. Rotifers
D. Microinvertebrates
E. None of the Above

157. These ____________ are relatively slow growing and generally only occur in systems with a detention time of >10 days.
A. Culex tarsalis
B. Lagoon (s)
C. Rotifers
D. Microinvertebrates
E. None of the Above

158. Mosquitoes grow in ____________ where shoreline vegetation is not removed and these may cause a nuisance and public health problem.
A. Culex tarsalis
B. Lagoon (s)
C. Rotifers
D. Microinvertebrates
E. None of the Above

159. Culex tarsalis, the vector of ____________in the western U.S., grows well in wastewater lagoons.
A. Culex tarsalis
B. Lagoon (s)
C. Rotifers
D. Microinvertebrates
E. None of the Above

160. The requirement for a minimum lagoon bank slope and removal of shoreline vegetation by most regulatory agencies is based on the public health need to reduce ____________.
A. Mosquito vectors
B. Lagoon (s)
C. Rotifers
D. Microinvertebrates
E. None of the Above

161. This is an indirect measure of biodegradable organic compounds in water, and is determined by measuring the dissolved oxygen decrease in a controlled water sample over a five-day period.
A. Biochemical Oxygen Demand
B. Aerobic
C. Nutrients
D. Organic Carbon
E. None of the Above

162. During the five-day BOD period, ___________ (oxygen-consuming) bacteria decompose organic matter in the sample and consume dissolved oxygen in proportion to the amount of organic material that is present.
A. Biochemical Oxygen Demand
B. Aerobic
C. Nutrients
D. Organic Carbon
E. None of the Above

163. In general, a high ___________ reflects high concentrations of substances that can be biologically degraded, thereby consuming oxygen and potentially resulting in low dissolved oxygen in the receiving water.
A. Biochemical Oxygen Demand
B. Aerobic
C. Nutrients
D. Organic Carbon
E. None of the Above

164. The BOD test was developed for samples dominated by oxygen-demanding pollutants like sewage. While its merit as a pollution parameter continues to be debated, ___________ has the advantage of a long period of record.
A. Biochemical Oxygen Demand
B. Aerobic
C. Nutrients
D. Organic Carbon
E. None of the Above

165. ___________ are chemical elements or compounds essential for plant and animal growth.
A. Biochemical Oxygen Demand
B. Aerobic
C. Nutrients
D. Organic Carbon
E. None of the Above

166. ___________ parameters include ammonia, organic nitrogen, Kjeldahl nitrogen, nitrate nitrogen (for water only) and total phosphorus.
A. Biochemical Oxygen Demand
B. Aerobic
C. Nutrients
D. Organic Carbon
E. None of the Above

167. High amounts of nutrients have been associated with eutrophication, or overfertilization of a water body, while low levels of ___________ can reduce plant growth and (for example) starve higher level organisms that consume phytoplankton.
A. Biochemical Oxygen Demand
B. Aerobic
C. Nutrients
D. Organic Carbon
E. None of the Above

168. Most ___________in water occurs as partly degraded plant and animal materials, some of which are resistant to microbial degradation.
A. Aerobic Bacteria
B. Aerobic
C. Total Organic Carbon
D. Organic Carbon
E. None of the Above

169. ___________is important in the estuarine food web and is incorporated into the ecosystem by photosynthesis of green plants, then consumed as carbohydrates and other organic compounds by higher animals.
A. Aerobic Bacteria
B. Aerobic
C. Total Organic Carbon
D. Organic Carbon
E. None of the Above

170. In another process, formerly living tissue containing ___________ is decomposed as detritus by bacteria and other microbes.
A. Aerobic Bacteria
B. Aerobic
C. Total Organic Carbon
D. Carbon
E. None of the Above

171. Bears a direct relationship with biological and chemical oxygen demand.
A. Aerobic Bacteria
B. Aerobic
C. Total Organic Carbon
D. Organic Carbon
E. None of the Above

172. High levels of ___________ can result from human sources, the high oxygen demand being the main concern.
A. Aerobic Bacteria
B. Aerobic
C. Total Organic Carbon
D. Organic Carbon
E. None of the Above

173. A condition in which free or dissolved oxygen is present in the aquatic environment?
A. Aerobic Bacteria
B. Aerobic
C. Total Organic Carbon
D. Organic Carbon
E. None of the Above

174. What are bacteria which will live and reproduce only in an environment containing oxygen. Oxygen combined chemically, such as in water molecules (H_2O), cannot be used for respiration by aerobes?
A. Anaerobic
B. Aerobic
C. Anaerobic Bacteria
D. Aerobic Bacteria
E. None of the Above

175. A condition in which **"free"** or dissolved oxygen is not present in the aquatic environment.
A. Anaerobic
B. Aerobic
C. Anaerobic Bacteria
D. Aerobic Bacteria
E. None of the Above

176. Bacteria that thrive without the presence of oxygen.
A. Anaerobic
B. Aerobic
C. Anaerobic Bacteria
D. Aerobic Bacteria
E. None of the Above

177. Bacteria that break down complex solids to volatile acids.
A. Anaerobic
B. Methane Fermenters
C. Anaerobic Bacteria
D. Saprophytic bacteria
E. None of the Above

178. Bacteria that break down the volatile acids to methane (CH_4) carbon dioxide (CO_2) and water (H_2O) are called?
A. Anaerobic
B. Methane Fermenters
C. Anaerobic Bacteria
D. Saprophytic bacteria
E. None of the Above

179. The addition of oxygen to an element or compound, or removal of hydrogen or an electron from an element or compound in a chemical reaction. The opposite of reduction.
A. Anaerobic
B. Methane Fermenters
C. Anaerobic Bacteria
D. Saprophytic bacteria
E. None of the Above

180. The addition of hydrogen, removal of oxygen or addition of electrons to an element or compound. Under anaerobic conditions in wastewater, sulfur compounds or elemental sulfur are reduced to H_2S or sulfide ions.
A. Anaerobic
B. Methane Fermenters
C. Anaerobic Bacteria
D. Reduction
E. None of the Above

181. We have some wastewater treatment plants that grow the microorganisms (Bugs) in large tanks. To have enough ____________ in the tanks we add oxygen by blowing air into the tank that is full of wastewater and microorganisms.
A. Oxygen
B. Settled bugs
C. Activated sludge
D. Secondary treatment
E. None of the Above

182. The air is bubbled in the water and mixes **"the bugs"** and food and ____________ together. When we treat wastewater this way, we call it the activated sludge method. With all of this food and air the microbes grow and multiply very rapidly.
A. Oxygen
B. Settled bugs
C. Activated sludge
D. Secondary treatment
E. None of the Above

183. Pretty soon the population of bugs gets too large and some of them need to be removed to make room for new bugs to grow. We remove the excess bugs by sedimentation in the same kind of tanks used for ____________. In the tank, the bugs sink to the bottom and we remove them.
A. Oxygen
B. Settled bugs
C. Activated sludge
D. Primary treatment
E. None of the Above

184. The ____________are also called waste activated sludge.
A. Oxygen
B. Settled bugs
C. Activated sludge
D. Secondary treatment
E. None of the Above

185. The waste sludge is treated separately. The remaining wastewater is now much cleaner. In fact, after primary and ____________, about 85% or more of all pollutants in the wastewater has been removed and it goes on to Disinfection.
A. Oxygen
B. Settled bugs
C. Activated sludge
D. Secondary treatment
E. None of the Above

186. Four (4) groups of bugs do most of the **"eating"** in the ____________process. The first group is the bacteria which eat the dissolved organic compounds.
A. Oxygen
B. Settled bugs
C. Activated sludge
D. Secondary treatment
E. None of the Above

187. The second and third groups of bugs are microorganisms known as the free-swimming and ___________. These larger bugs eat the bacteria and are heavy enough to settle by gravity.
A. Mixed liquor
B. Suctoria
C. Stalked ciliates
D. Bacteria
E. None of the Above

188. The fourth group is a microorganism, known as ___________, which feed on the larger bugs and assist with settling.
A. Mixed liquor
B. Suctoria
C. Activated sludge
D. Bacteria
E. None of the Above

189. The interesting thing about the bacteria that eat the dissolved organics is that they have no mouth. The ___________ have an interesting property--their "fat reserve" is stored on the outside of their body. This fat layer is sticky and is what the organics adhere to.
A. Mixed liquor
B. Suctoria
C. Activated sludge
D. Bacteria
E. None of the Above

190. Once the bacteria have **"contacted"** their food, they start the digestion process. A chemical ___________ is sent out through the cell wall to break up the organic compounds.
A. Mixed liquor
B. Enzyme
C. Activated sludge
D. Bacteria
E. None of the Above

191. This hydrolytic enzyme, breaks the organic molecules into small units which are able to pass through the cell wall of the ___________.
A. Mixed liquor
B. Suctoria
C. Activated sludge
D. Bacteria
E. None of the Above

192. In wastewater treatment, this process of using bacteria-eating-bugs in the presence of oxygen to reduce the organics in water is called ___________.
A. Mixed liquor
B. Suctoria
C. Activated sludge
D. Bacteria
E. None of the Above

193. The first step in the process, the contact of the bacteria with the ___________, takes about 20 minutes. The second step includes the breaking up, ingestion and digestion processes, which take 4 to 24 hours.
A. Mixed liquor
B. Suctoria
C. Organic process
D. Bacteria
E. None of the Above

194. The fat storage property of the bacteria is also an asset in settling. As the ___________ "bump" into each other, the fat on each of them sticks together and causes flocculation of the non-organic solids and biomass.
A. Mixed liquor
B. Suctoria
C. Bugs
D. Bacteria
E. None of the Above

195. From the aeration tank, the wastewater, now called ___________, flows to a secondary clarification basin to allow the flocculated biomass of solids to settle out of the water.
A. Mixed liquor
B. Suctoria
C. Activated sludge
D. Bacteria
E. None of the Above

196. The ___________, which is the activated sludge, contains millions of bacteria and other microorganisms, and is used again by returning it to the influent of the aeration tank for mixing with the primary effluent and ample amounts of air.
A. Vorticella
B. Euglypha
C. Solids biomass
D. Bacteria
E. None of the Above

197. Paramecium is a medium size to large swimming ___________, commonly observed in activated sludge, sometimes in abundant numbers.
A. Vorticella
B. Ciliate
C. Paramecium
D. Bacteria
E. None of the Above

198. The ___________ body is either foot-shaped or cigar-shaped, and somewhat flexible.
A. Vorticella
B. Euglypha
C. Paramecium
D. Bacteria
E. None of the Above

199. ___________ is uniformly ciliated over the entire body surface with longer cilia tufts at the rear of the cell.
A. Vorticella
B. Euglypha
C. Paramecium
D. Bacteria

200. Paramecium swims with a smooth gliding motion. It may also be seen paired up with another ___________ which makes a good diagnostic key.
A. Vorticella
B. Euglypha
C. Paramecium
D. Bacteria
E. None of the Above

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