UNIVERSITY OF AGRICULTURE, ABEOKUTA

DEPARTMENT OF WATER RESOURCES MANAGEMENT & AGROMETEOROLOGY

2009/2010 SECOND SEMESTER EXAMINATION

WMA 318: WATER QUALITY ASSESSMENT AND POLLUTION CONTROL

TIME: 2 Hrs

INSTRUCTIONS: Answer ALL Question in Section A and other ANY Other 2 from Section B

SECTION A: Answer ALL Questions

1. Sources of ..... in surface waters are primarily atmospheric reaeration and photosynthetic activity of aquatic plants.
2. The attraction between molecules of a liquid is shown at a liquid surface by the phenomenon called .....
3. ..... is the measure of transparency of water column; indirect method of measuring ability of suspended and colloidal materials to minimize penetration of light through water.
4. ..... is not measured directly, some sondes include the capability of calculating and recording it based on conductivity measurement
5. The 2 Chemical Constitution of Water are ..... **and** .....
6. In surface water, DO concentration typically range from ..... mg/l.
7. ..... introduces insects and plant diseases that target specific weed or other pest populations
8. Which agency is responsible for Water Quality in Nigeria? .....
9-11 In Nigeria, the interim water quality criterion for
9. BOD for the protection of aquatic life is ..... $O_2\ l^{-1}$ (water temperature 20-33 °C)
10. For irrigation water it is ..... $O_2\ l^{-1}$
11. Recreational waters it is ..... $O_2\ l^{-1}$
12-14. In Drinking water source after conventional treatment and disinfection, the
12. Total Coliforms Organism MPN/100ml shall be ..... or less
13. Dissolved Oxygen ..... or more
14. Biochemical Oxygen Demand 5 days 20°C, ... or less
15-17 In Propagation of Wild life and Fisheries, the
15. pH between .....**and** .....
16. Dissolved Oxygen ..... or more
17. Biochemical Oxygen Demand 5 days 20°C, ... or less
18. Specific conductance is the conductivity expressed in units of ..... at 25°C.
*19-22 What **colour coding** is frequently used to depict the quality of water on maps with*
19. Water that is directly used for drinking, industrial use is .....**colour**
20. Water contained in soil and plants are termed ..... **colour**
21. Various grades of wastewater are shown **as** ..... **or** ..... **colour**
22. ..... criteria are developed by scientists and provide basic scientific information about the effects of water pollutants on a specific water use
23. The higher the salt content in water, the lower the concentration of ..... and the other gases
24. ..... may come from either a surface or ground source, and typically contains less than 1% sodium chloride.
25. The water purification processes are Abstraction – Screening - Aeration- ..... – Flocculation – Sedimentation – Filtration - Chlorination.
26. ..... contains between 1 and 2.5% sodium chloride, either from natural sources around otherwise fresh water or by dilution of seawater.

27. Soil erosion, chemical runoff, and animal waste pollution are all examples of .....pollution.
28. ..... is fresh water that is sanitized with oxidizing biocides such as chlorine or ozone to kill bacteria and make it safe for drinking purposes.
29. ..... relies on planting factors such as crop rotation and planting after weeds have been killed following germination.
30. A substances that is poisonous to living organism such as pesticide is known as .....
31. ..... is that which originates in oil and gas production, emanating from geological sources with the hydrocarbons.
32. ..... also known as "the end of the pipe pollution"
33. ..... is simply one or a series of shallow holding pits into which wastes are pumped and treated.
34. Water condensed from industrial steam is called .....
35. ..... treatment uses aeration and aerobic, or oxygen-using, bacteria to break down organic wastes.
36. Just as there is no single source of....., there is no single answer to solve the problem.
37. The process when a living organism cannot metabolize or excrete an ingested substance that gradually accumulates into the organism is called .....
38. ..... are generally used in rural areas to handle household wastes.
39. The movement of soil into water supplies is known as .....
40. The adding of chemical to removed suspended solid in water purification processes is know as ...

Section B: ANSWER ANY TWO QUESTIONS

1. **(A)** A 500-mL aqueous salt slotion has 250 mg of salt dissolved in it. Expressed the concentration of this solution in terms of (i) mg/L, (ii) ppm, (iii) gpg, and (iv) percent

(B) A sample of sewage from a town is found to have a BOD after 5 days (BOD_5) of 200 mg/L. Estimate the ultimate BOD (BOD_L) of the sewage. Assume that k = 0.1/d for this wastewater.

(C) The weight of an empty evaporating dish is determined 39.025g. After a water sample is filtered, 200 mL of the sample is evaporated from the dish. The weight of the dish plus the dried residue is found to be 38.250g. Compute the TDS concentration; is the TDS within the acceptable standards?

2. **(A)** A 10 mL sample of wastewater is diluted to 300mL with distilled water in a standard BOD bottle. The initial DO in the bottle is determined to be 8.5mg/L, and the DO after 5 days at 20°C is found to be 6.5mg/L. Determined the BOD_5 of the wastewater and compute its BOD_L. Assume that k = 0.1/d

(B) A wastewater sample has an ultimate BOD of 280mg/L. A 5-mL Volume of this sample is diluted to 300 mL in a BOD bottle, and the initial DO is determined to be 9.0 mg/L. What is the expected DO in the bottle after 5 days of incubation if k = 0.1d?

3. A river has a dry-weather discharge of 100 cfs and a temperature of 25°C. Compute the maximum water at 65°C that can be discharged from a power plant into the stream. Assume the legal limit on the temperature increase in the stream is 2°C