# Analyst I Practice Exam

The following are typical questions found on the Analyst I Exam. The answers to these ten questions and their references are at the end of the exam, pp 4-8.

1. The pH of an acid solution at 25 $^0$C is:

a. Only above pH 10.0
b. Above pH 7.0
c. Below pH 7.0
d. Only below pH 2.0

2. Given the following data, calculate the BOD of a sample diluted 20 mL into a 300 mL BOD bottle.

Initial DO: 8.81 mg/L
Final DO: 5.22 mg/L
Amount of seed used: 2.0 mg/L
Seed depletion: 0.35 mg/L/mL

a. 120 mg/L
b. 64 mg/L
c. 43 mg/L
d. 17 mg/L

3. Which one of the following is an interference in the Total Chlorine Residual DPD Colorimetric test?

a. Turbidity
b. Hypochlorous acid
c. Chloramines
d. Dissolved Oxygen

4. Samples Collected for Total Phosphorus must be preserved immediately by:

a. Potassium hydroxide (KOH) to pH > 10
b. Cooling to < 10 $^o$C and Sodium hydroxide (NaOH) to pH > 8.5
c. Cooling to ≤ 6 $^0$C and Sulfuric acid ($H_sSO_4$) to pH < 2
d. Phosphoric acid ($H_3PO_4$) to pH ≤ 4.5

5. Appropriate gloves are one part of your Personal Protection Equipment (PPE) worn in laboratory settings, especially when working with toxic chemicals. However, you should remove your gloves to handle:

a. Autoclave tape
b. Dilute PFAS samples

c. Class A glassware
d. Phones and doorknobs

6. What is 95 $^{o}$F in $^{o}$C?

a. 120
b. 95
c. 72
d. 35

7. Which piece of glassware should you use to measure 50.00 mL of a solution?

a. Thermal-stabilized Teflon beaker
b. Class X narrow beaker
c. Pipet using a rubber bulb
d. Class A volumetric flask

8. Volatile Solids are:

a. Solids lost from a sample after ignition
b. Fixed solids like sand and glass particles
c. Only those solids which pass through a glass-fiber filter
d. Solids retained on a glass-fiber filter after ignition

9. The number 570.0 has how many significant figures?

a. 2
b. 3
c. 4
d. 5

10. The estimate of how close a measured value is to the true value is:

a. Accuracy
b. Precision
c. Mode
d. Detection Limit

# Answers to Analyst I Practice Exam

The answers are in **bold** font.

1. The pH of an acid solution at 25 $^0$C is:

a. Only above pH 10.0
b. Above pH 7.0
**c. Below pH 7.0**
d. Only below pH 2.0

Reference: Standard Methods for the Examination of Water and Wastewater, 23rd edition 2017: 4500 – $H^+$ pH Value.

2. Given the following data, calculate the BOD of a sample diluted 20 mL into a 300 mL BOD bottle.

Initial DO: 8.81 mg/L
Final DO: 5.22 mg/L
Amount of seed used: 2.0 mg/L
Seed depletion: 0.35 mg/L/mL

a. 120 mg/L
b. 64 mg/L
**c. 43 mg/L**
d. 17 mg/L

Biochemical Oxygen Demand (seeded), mg/L =

$$\frac{[(\text{Initial DO,mg/L}) - (\text{Final DO,mg/L}) - (\text{Seed Correction,mg/L})]\ [300\ \text{mL}]}{\text{Sample Volume,mL}}$$

Biochemical Oxygen Demand (seeded), mg/L =

$$\frac{[(8.81\ \text{mg/L}) - (5.22\ \text{mg/L}) - (2.0\ \text{mg/L} \times 0.35\ \text{mg/L/mL})]\ [300\ \text{mL}]}{20\ \text{mL}}$$

Biochemical Oxygen Demand (seeded), mg/L = 43 mg/L

References:

NEWEA Formula/Conversion Table for Lab Analyst Exam.

Standard Methods for the Examination of Water and Wastewater 23rd edition 2017. 5-Day BOD Test 5210 B.

Operation of Wastewater Treatment Plants, Volume II, 7th edition. California State University, Sacramento, CA

2007. Chapter 16, Lesson 8 of 9, Biochemical Oxygen Demand (BOD).

3. Which one of the following is an interference in the Total Chlorine Residual DPD Colorimetric test?

**a. Turbidity**
b. Hypochlorous acid
c. Chloramines
d. Dissolved Oxygen

Reference:

Standard Methods for the Examination of Water and Wastewater 23rd edition 2017. 4500-Cl G. DPD Colorimetric Method.

4. Samples Collected for Total Phosphorus must be preserved immediately by:

a. Potassium hydroxide (KOH) to pH > 10
b. Cooling to < 10 $^{o}$C and Sodium hydroxide (NaOH) to pH > 8.5
**c. Cooling to ≤ 6 $^{0}$C and Sulfuric acid ($H_sSO_4$) to pH < 2**
d. Phosphoric acid ($H_3PO_4$) to pH ≤ 4.5

Reference:

40 CFR 136 Table 11 Required Containers, Preservation Techniques, and Holding Times.

5. Appropriate gloves are one part of your Personal Protection Equipment (PPE) worn in laboratory settings, especially when working with toxic chemicals. However, you should remove your gloves to handle:

a. Autoclave tape
b. Dilute PFAS samples
c. Class A glassware
**d. Phones and doorknobs**

Reference:

Standard Methods for the Examination of Water and Wastewater 23rd edition 2017. 1090 B. Safe laboratory Practices, section 3 Personal Protection Equipment.

6. What is 95 $^{o}$F in $^{o}$C?

a. 120
b. 95
c. 72
**d. 35**

Degrees Celsius ($^{o}$C) =

$$\frac{(°F - 32)}{1.8}$$

$$\frac{(95-32)}{1.8}$$

$$= 35\ ^{o}C$$

References:

NEWEA Formula/Conversion Table for Lab Analyst Exam.

Operation of Wastewater Treatment Plants, Volume II. California State University, Sacramento, CA 2007. Chapter 16, Lesson #9 Temperature, G Calculations.

Operation of Wastewater Treatment Plants, Volume II. California State University, Sacramento, CA 2007. Chapter 16, Section 16.11 The Metric System.

7. Which piece of glassware should you use to measure 50.00 mL of a solution?

a. Thermal-stabilized Teflon beaker
b. Class X narrow beaker
c. Pipet using a rubber bulb
**d. Class A volumetric flask**

Reference:

Operation of Wastewater Treatment Plants, Volume II, 7th edition. California State University, Sacramento, CA 2007. Chapter 16, Lesson 1 of 9, Laboratory Equipment. Use of Laboratory Glassware.

8. Volatile Solids are:

**a. Solids lost from a sample after ignition**
b. Fixed solids like sand and glass particles
c. Only those solids which pass through a glass-fiber filter
d. Solids retained on a glass-fiber filter after ignition

Reference:

Standard Methods for the Examination of Water and Wastewater 23rd edition 2017. 2540 Solids, section 1. Terminology

9. The number 570.0 has how many significant figures?

a. 2
b. 3

**c. 4**
d. 5

Reference:

Standard Methods for the Examination of Water and Wastewater 23rd edition 2017. 1050 B. Significant Figures.

10. The estimate of how close a measured value is to the true value is:

**a. Accuracy**
b. Precision
c. Mode
d. Detection Limit

Reference:

Standard Methods for the Examination of Water and Wastewater 23rd edition 2017. 1010 C. Terminology.

(06/17/2024)