Choose the most accurate answer for each of the following multiple-choice questions

1-A pharmaceutical laboratory must determine the exact amount of active ingredient in a solid drug sample with very high accuracy and without using calibration standards.

Which analytical method is most appropriate?

A. Spectrophotometric analysis
B. Volumetric (titrimetric) analysis
C. Gravimetric analysis
D. Potentiometric analysis
E. Conductometric analysis

2-During a gravimetric analysis for the determination of chloride ions, the measured mass of the precipitate was consistently higher than the true value.

Which of the following is the most scientifically valid explanation for this observation?

A. Partial dissolution of the precipitate during washing
B. Mechanical loss of precipitate during filtration
C. All of these
D. Incomplete precipitation of the analyte
E. Surface adsorption of impurities on the precipitate

3-The quantitative determination of the active ingredient in a drug is performed in the monograph section called:

A. Assay
B. Description
C. None of these
D. Storage
E. Packaging

4-The primary responsibility of Quality Control (QC) laboratories is to:

A. Develop new pharmaceuticals
B. Ensure materials meet required specifications
C. Perform clinical trials
D. Publish pharmacopoeias
E. Promote drug products

5- How many aluminum (Al) atoms are present in a piece of aluminum foil with a mass of 0.054 g?

(Atomic weight of Al = 26.98 g/mol, Avogadro's number = 6.022×10^{23} mol^{-1})

A. 6.02×10^{20}
B. 1.20×10^{21}
C. 2.41×10^{21}
D. 6.02×10^{21}
E. 1.20×10^{22}

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