QUESTION 6

2.5 g sample of AgNO3 is dissolved in 50 ml of water. It is titrated with 50 ml of KI solution. The AgI precipitate is filtered out.
Excess KI in the filtrate is titrated with 50 ml M/10 KIO3 acidified with dilute H2SO4, 20 mlof the same stock solution
of KI requires 30 ml of M/10 KIO3 under similar conditions. Calculate the percentage of AgNO3 in the sample.

Answer: (option 1) 85%

20 mL of the same stock solution of KI requires 30 mL of M/10 KIO_3.
50 mL of the same stock solution of KI requires 30×(50/20)=75 mL of M/10 KIO_3.

Out of this, 50 mL is required for reaction with excess KI.
Hence, 75–50=25 mL of KIO_3 corresponds to the KI that has reacted with $AgNO_3$.

1 mole KIO_3 = 2 mole KI = 2 mole $AgNO_3$
Number of moles of $AgNO_3$ = 2 x (25/(10 x 100)) = 0.005 moles

Mass of $AgNO_3$ = 0.005×169.87 =0.85 g

The percentage of silver nitrate in the sample =10.85×100=85 %.