

**Question 27:** A particular acid-rain water has  $\text{SO}_2$ . If a 25.00 mL sample of this water requires 35 mL of 0.02 M  $\text{KMnO}_4$  for its titration, what is the molarity of  $\text{SO}_3^{2-}$  in acid-rain?  $2\text{MnO}_4^- + 5\text{SO}_3^{2-} + 6\text{H}^+ \rightarrow 5\text{SO}_4^{2-} + 2\text{Mn}^{2+} + 3\text{H}_2\text{O}$ .

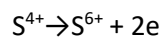
**ANSWER: OPTION 1**

$$\text{Meq. of } \text{SO}_3^{2-} = \text{Meq. of } \text{KMnO}_4$$

$$\therefore N \times 25 = 35 \times 0.02 \times 5$$

$$N = 0.14$$

$$\therefore M = 0.14/2 = 0.07$$



$$N_{\text{SO}_3^{2-}} = 0.14 \text{ N}$$

$$M_{\text{SO}_3^{2-}} = 0.14/2 = \mathbf{0.07 \text{ M}}$$