Environmental Engineering

Answer Keys and Explanations

1. **[Ans. B]**

2. **[Ans. B]**

3. **[Ans. B]**

4. **[Ans. B]**

5. **[Ans. A]**

6. **[Ans. B]**

7. **[Ans. D]**

8. **[Ans. C]**

9. **[Ans. *] Range: 5.8 to 6.2**
Estimation of lime
1 mg of alum requires 0.45 mg of alkalinity as $CaCO_3$
15 mg of alum requires 6.75 mg of alkalinity as $CaCO_3$
Available alkalinity $= 1$ mg/l
Additional alkalinity required $= 5.75$ mg/l
1 mg of alkalinity as $CaCO_3$ requires 0.56 mg of CaO
$\therefore$ Total lime required $= 0.56 \times 5.75$
$= 3.22$ mg/l
Purity of quick lime $= 80\%$
$\therefore$ Actual lime required $= \frac{3.22}{0.8} = 4.025$ mg/l
Total lime to be added $= 4.025 \times 50 \times 10^6 \times 30$
$= 6037500000$ mg
$= 6.04$ tonnes

10. **[Ans. A]**