CHEMISTRY

1. (2)
   Greater are the concentrations of the reactants, faster is the reaction. Conversely, as the concentrations of the reactants decreases, the rate of reaction also decreases.

2. (3)
   $$r = \frac{-\Delta C}{\Delta t}$$

3. (4)
   'A' will disappear at twice the rate at which 'B' will decrease.

4. (2)
   $$10 \xrightarrow{2} 20 \xrightarrow{2} 30 \xrightarrow{2} 40 \xrightarrow{2} 50 \xrightarrow{2}$$
   $$60 \xrightarrow{2} 70 \xrightarrow{2} 80 \xrightarrow{2} 90 \xrightarrow{2} 100$$

   Increase in rate, $r = 2^9$ or $r = 2^{\frac{\Delta t}{10}}$

5. (1)

6. (4)
   The specific rate constant of a first order reaction depends upon the temperature of reaction.

7. (3)
   The unit of K for zero order reaction mol L^{-1} s^{-1}.

8. (1)

9. (2)
   $$k = \frac{2.303}{t} \log \frac{a}{a-x}$$
   $$\frac{0.693}{T} = \frac{2.303}{t} \log \frac{100}{100-30}$$
   $$\therefore T = 58.2 \text{ min.}$$

10. (2)
    $$t_{1/2} = \frac{0.693}{k} \Rightarrow \frac{0.693}{1.1 \times 10^{-9}} = 6.3 \times 10^8 \text{ s}$$