CHEMISTRY

11. 75% of a first order reaction was completed in 32 minutes; when was 50% of the reaction completed?
(1) 4 min (2) 8 min
(3) 24 min (4) 16 min

12. The chemical reaction, $2O_3 \rightarrow 3O_2$ proceeds as follows
$O_3 \rightarrow O_2 + O$ (fast)
$O + O_3 \rightarrow 2O_2$ (slow)
The rate law expression should be
(1) $r = k[O_3]^2$
(2) $r = k[O_3]^2[O_2]^{-1}$
(3) $r = k\,[O_3][O_2]$
(4) $r = [O_3][O_2]^2$

13. The rate of a reaction can be increased in general by all the following factors except
(1) by increasing the temperature
(2) using a suitable catalyst
(3) by increasing the concentration of reactants
(4) by an increase in activation energy

14. For the following reaction
$4NH_3(g) + 5O_2(g) \rightarrow 4NO(g) + 6H_2O(g)$ If the rate of formation of NO is 3.6×10^{-3} mol L^{-1} s^{-1}, then what is the rate of formation of H_2O?
(1) 3.6×10^{-3} mol L^{-1} s^{-1}
(2) 5.4×10^{-3} mol L^{-1} s^{-1}
(3) 7.2×10^{-3} mol L^{-1} s^{-1}
(4) 2.4×10^{-3} mol L^{-1} s^{-1}

15. Consider the following data for the reaction, A + B → Products

Expt	Initial conc. [A]	Initial conc. [B]	Initial rate (mol s^{-1})
1	0.10 M	1.0 M	2.1×10^{-3}
2	0.20 M	1.0 M	8.4×10^{-3}
3	0.20 M	2.0 M	8.4×10^{-3}

The rate equation of the reaction is
(1) $r = k[A]^2$
(2) $r = k[B]^2$
(3) $r = k[A]^2\,[B]^1$
(4) $r = k[A]^1\,[B]^1$

16. The rate of reaction,
$2NO + Cl_2 \rightleftharpoons 2NOCl$
becomes double when the concentration of Cl_2 is doubled. When the concentration of both the reactants is doubled, the rate becomes eight times. What will be the order of the reaction?
(1) Zero (2) First
(3) second (4) Third

17. In the reaction A → B when the concentration of reactants is increased by 8 times, the rate of reaction increases only 2 times. The order of reaction would be
(1) 2 (2) $\frac{1}{3}$
(3) 4 (4) $\frac{1}{2}$

18. If a substance with half life 3 days is taken to another place in 12 days. What amount of substance is left now?
(1) $\frac{1}{4}$ (2) $\frac{1}{8}$
(3) $\frac{1}{16}$ (3) $\frac{1}{32}$

19. For a second order reaction rate at a particular time is x. If the initial concentration is tripled, the rate will become
(1) 3x (2) $9x^2$
(3) 9x (4) 27x

20. The rate constant of a reaction is found to be 3×10^{-3} mol L^{-1} min^{-1}. The order of the reaction is
(1) Zero (2) 1
(3) 2 (4) 1.5