1.

Which statement about the oxides of nitrogen is correct?

A During lightning storms, atmospheric oxygen and nitrogen combine to form oxides of nitrogen.

B In a catalytic converter, nitrogen monoxide is removed by reaction with carbon dioxide.

C In car engines, the restricted supply of oxygen eliminates the possibility of the formation of oxides of nitrogen.

D In the atmosphere, nitrogen monoxide reacts with sulfur dioxide to produce sulfur trioxide.

Ans: A

2.

If ammonium cyanate is heated in the absence of air, the only product of the reaction is urea, $CO(NH_2)_2$. No other products are formed in the reaction.

What is the formula of the cyanate ion present in ammonium cyanate?

A CON_2^- **B** CON_2^{2-} **C** OCN^- **D** OCN^{2-}

Ans: C

3.

When ammonia, NH_3, is dissolved in water, a small concentration of ammonium ions, NH_4^+, is formed.

Which row is correct?

	number of electrons in one ammonium ion	change of the H–N–H angle from ammonia to the ammonium ion
A	8	decreases
B	8	increases
C	10	decreases
D	10	increases

Ans: D

4.

Two procedures are described.

1 Sulfur is burned in an excess of oxygen and then NO is added to the product mixture.

2 Sulfur is burned in an excess of oxygen and then NO_2 is added to the product mixture.

Which procedures will produce some sulfur trioxide, SO_3?

A both 1 and 2 **B** 1 only **C** 2 only **D** neither 1 nor 2

Ans: A

- S and excess O2 = SO2
- SO2 can be catalysed to SO3 in presence of NO2
- NO + O2 = NO2; thus the NO that is added, will react with excess O2 to form NO2, which reacts with the SO2