

## Chemistry

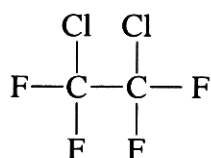
## Section I – Part B (continued)

Marks

## Question 25 (6 marks)

- (a) What is the systematic name of the CFC in the diagram?

1



1,2-dichloro-1,1,2,2-tetrafluoroethane

- (b) Identify the bonding within ozone, using a Lewis electron-dot diagram.

2



- (c) Discuss how CFCs damage the ozone layer, using relevant equations.

3

CFCs make their way into the stratosphere

(where the ozone layer is) where they are broken

up by UV radiation:  $\text{CF}_3\text{Cl}(\text{g}) \xrightarrow{\text{UV}} \text{CF}_3(\text{g}) + \text{Cl}(\text{g})$

and release a highly reactive chlorine atom. This chlorine atom

reacts with ozone:  $\text{Cl}(\text{g}) + \text{O}_3(\text{g}) \rightarrow \text{ClO}(\text{g}) + \text{O}_2(\text{g})$

and destroys the ozone. Then this reaction occurs

with an oxygen free radical:  $\text{ClO}(\text{g}) + \text{O}(\text{g}) \rightarrow \text{Cl}(\text{g}) + \text{O}_2(\text{g})$

So the Cl is not permanently used up and one CFC molecule can cause the destruction of thousands of Ozone molecules.