

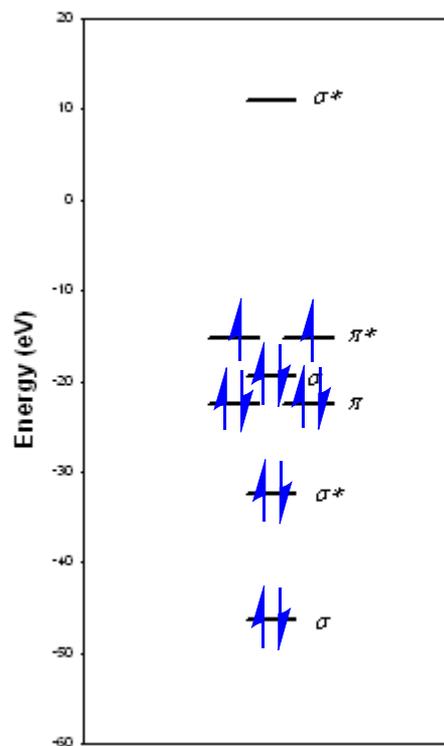
- Oxygen gas, O_2 , constitutes about 21% of the Earth's atmosphere.

Marks**4**

How many valence electrons are there in O_2 ?

$$2 \times 6 = 12$$

Complete the MO diagram for the ground state electronic configuration of O_2 by inserting an arrow to represent each valence electron.



What is the bond order of O_2 ?

$$\frac{1}{2} (8-4) = 2$$

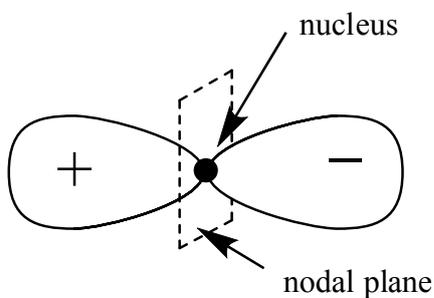
Do you expect O_2 to be paramagnetic? Explain your answer.

O_2 is paramagnetic as it possesses two unpaired electrons (in π^*)

- Sketch the following wave functions as lobe representations.

2

(a) a $2p$ atomic orbital



(b) a π^* molecular orbital

