

Question 5 (Answer: B)

- Each nitrogen in N_2 is sp hybridised, giving two sp orbitals and two unhybridised p orbitals.
- The σ bond comes from head-on overlap of one sp orbital from each atom.
- The remaining sp orbital on each nitrogen holds its lone pair; the p orbitals make the two π bonds.

Question 25 (Answer: A)

- Methanal's carbon is sp^2 hybridised, so the whole molecule is planar.
- It has two C-H bonds and one C=O .
- A double bond is one σ plus one π , so there are three σ bonds in total – both statements hold.

Question 6 (Answer: B)

- The two carbons of the $\text{C}\equiv\text{C}$ triple bond are sp hybridised.
- The methyl carbon has four single bonds, so it is sp^3 .
- There is no trigonal-planar carbon anywhere in propyne, so no sp^2 appears.