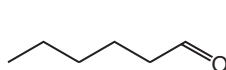
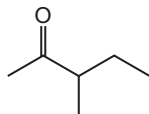


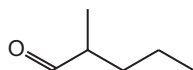
25 The diagrams show skeletal formulas of some isomers of $C_6H_{12}O$.



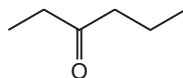
1



2



3



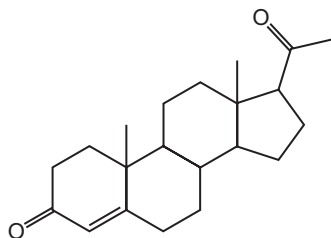
4

Which statement is correct?

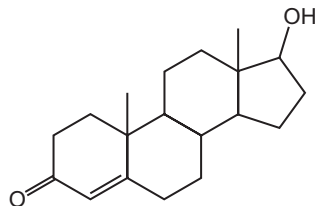
- A 1 and 3 are chain isomers of each other and positional isomers of each other.
- B 2 and 3 are functional group isomers of each other and both have a chiral centre.
- C 1 and 4 are functional group isomers of each other and both have a chiral centre.
- D 2 and 4 are positional isomers of each other and functional group isomers of each other.

26 The skeletal formulas of two compounds are shown.

progesterone



testosterone



Which statements about progesterone and testosterone are correct?

- A They both contain a ketone group, and they both have geometrical isomers due to the $C=C$ bond.
- B They have the same molecular formula, and they both have geometrical isomers.
- C They have the same number of chiral carbons, and they have the same molecular formula.
- D They have the same number of chiral carbons, and they both contain a ketone group.

5 The bonding between two atoms of nitrogen in an N_2 molecule involves the hybridisation of atomic orbitals to form sp orbitals.

Which row is correct?

	formation of the σ bond between the nitrogen atoms in N_2	type of orbital which contains the lone pair of electrons on each nitrogen atom in N_2
A	an sp orbital from one atom overlaps with an sp orbital of the other atom	p
B	an sp orbital from one atom overlaps with an sp orbital of the other atom	sp
C	an s orbital from one atom overlaps with a p orbital of the other atom	p
D	an s orbital from one atom overlaps with a p orbital of the other atom	sp

25 Two statements about a molecule of methanal are given.

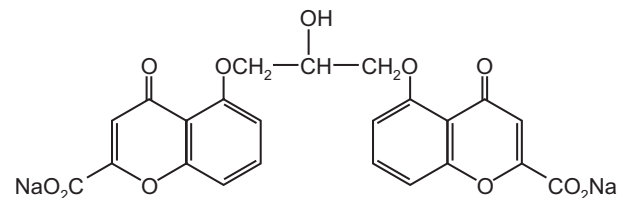
- 1 It is planar.
- 2 It contains three σ bonds.

Which statements are correct?

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

26 The structure of disodium cromoglycate is shown.

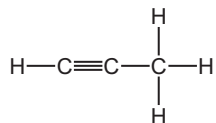
disodium cromoglycate



How many chiral centres are there in this molecule?

- A 0
- B 1
- C 2
- D 3

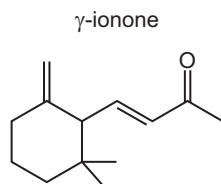
6 The diagram shows the bonding in a molecule of propyne.



Which types of hybridisation are shown by the carbon atoms in propyne?

- A** sp , sp^2 and sp^3
B sp and sp^3 only
C sp^2 and sp^3 only
D sp^2 only

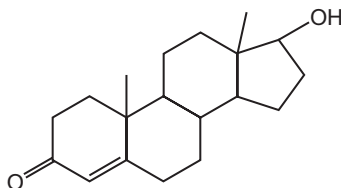
26 The structure of the compound γ -ionone is shown.



Including γ -ionone, how many stereoisomers exist with this molecular formula?

- A** 1 **B** 2 **C** 4 **D** 8

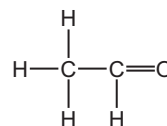
28 The diagram shows the skeletal formula of the hormone testosterone.



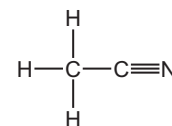
What is the molecular formula of testosterone?

- A** $C_{19}H_{28}O_2$ **B** $C_{17}H_{22}O_2$ **C** $C_{17}H_{24}O_2$ **D** $C_{19}H_{26}O_2$

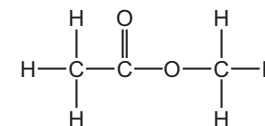
37 The structures of three organic compounds are shown.



1



2



3

Which compounds produce ethanoic acid when heated with $HCl(aq)$?

- A** 1, 2 and 3 **B** 1 and 2 only **C** 1 and 3 only **D** 2 and 3 only