Resonance

1. Which one in the following is not the resonance structure of CO_2

(a) $O = C = O$

(b) $-O - C \equiv O^+$

(c) $+O \equiv C - O^-$

(d) $O \equiv C = O$

2. Which of the following molecule contains one pair of non-bonding electrons

(a) CH_4 (b) NH_3

(c) H_2O (d) HF

3. Resonance is due to

(a) Delocalization of *sigma* electrons

(b) Delocalization of *pi* electrons

(c) Migration of *H* atoms

(d) Migration of protons

4. Resonating structures have different

(a) Atomic arrangements

(b) Electronic arrangements

(c) Functional groups

(d) Alkyl groups

5. In the cyanide ion, the formal negative charge is on

(a) *C*

(b) *N*

(c) Both *C* and *N*

(d) Resonate between *C* and *N*

6. Which does not show resonance

(a) Benzene (b) Aniline

(c) Ethyl amine (d) Toluene

7. The enolic form of acetone contains

(a) 9 sigma bonds, 1 pi bond and 2 lone pairs

(b) 8 sigma bonds, 2 pi bonds and 2 lone pairs

(c) 10 sigma bonds, 1 pi bond and 1 lone pair

(d) 9 sigma bonds, 2 pi bonds and 1 lone pair

8. Point out incorrect statement about resonance

(a) Resonance structures should have equal energy

(b) In resonance structures, the constituent atoms should be in the same position

(c) In resonance structures, there should not be the same number of electron pairs

(d) Resonance structures should differ only in the location of electrons around the constituent atoms

9. The number of possible resonance structures for CO_3^{2-} is

(a) 2 (b) 3

(c) 6 (d) 9

10. Resonance hybrid of nitrate ion is

(a) $-1/2O\cdots\cdots N\cdots\cdots O^{-1/2}$
$\vdots$
$\rightleftarrows O^{-1/2}$

(b) $-2/3\overline{O\cdots\cdots}\,\overline{N\cdots\cdots}\,O^{-2/3}$
$|\;\vdots$
$\rightleftarrows O^{-2/3}$

(c) $-1/3\overline{O\cdots\cdots}\,\overline{N\cdots\cdots}\,O^{-1/3}$
$|\;\vdots$
$\rightleftarrows O^{-1/3}$

(d) $-2/3O\cdots\cdots \overset{+}{N}\ldots\ldots O^{-2/3}$
$\vdots$
$\rightleftarrows O^{-2/3}$

11. CO_3^{2-} anion has which of the following characteristics

(a) Bonds of unequal length

(b) sp^2 hybridization of *C* atom

(c) Resonance stabilization

(d) Same bond angles