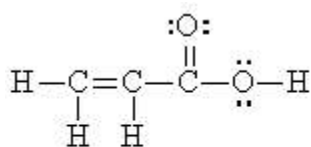
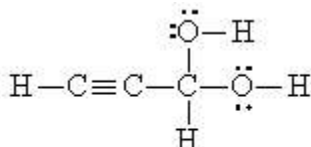


Consider the following Lewis Structures for the next two questions:

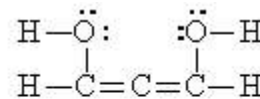
[fall 02, ex1]



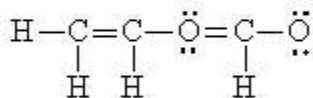
(a)



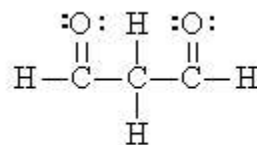
(b)



(c)



(d)

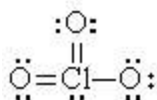


(e)

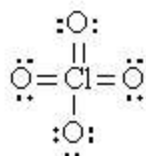
- Which one is NOT a reasonable Lewis structure for an organic molecule with molecular formula $\text{C}_3\text{H}_4\text{O}_2$?
- Which one of the Lewis structures will have 2 carbons with linear VSEPR geometry and 1 carbon with tetrahedral VSEPR geometry?

Consider the following Lewis structures for the next four questions:

[fall 02, ex1]



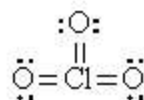
(a)



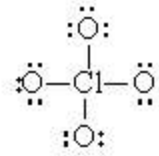
(b)



(c)



(d)

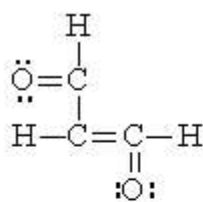


(e)

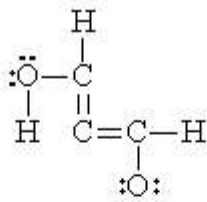
- Which one is a good Lewis structure for chlorate?
- How many *additional completely equivalent* resonance structures can you write for the structure (d)? (Don't count (d) in your total.)
(a) 0 (b) 1 (c) 2 (d) 3 (e) 4
- Which one of these structures has Cl with a +1 formal charge?
- What is the approximate O-Cl-O bond angle in structure (b)?
(a) 60° (b) 90° (c) 109° (d) 120° (e) 180°

For the next 5 questions, consider the following Lewis structures for a -1 anion with molecular formula $C_3H_3O_2$. All structures have the same number of electrons.

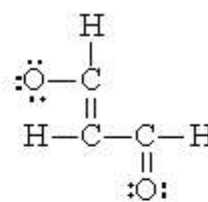
[spring 02,ex1]



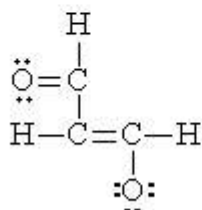
(a)



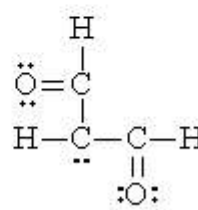
(b)



(c)

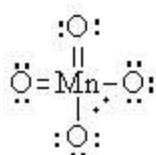


(d)

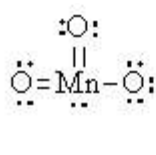


(e)

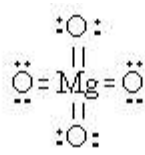
- Which structure can't exist?
- Which structure is **not** a resonance structure of the others?
- Which two are completely equivalent resonance structures? (Mark two answers on your scantron.)
- Which structure has a carbon with a -1 charge?
- What should the C-C-C bond angle be in structure (b)?
(a) 60° (b) 90° (c) 109° (d) 120° (e) 180°
- Which one of the following is a correct Lewis structure for permanganate ion? (Manganese has 7 valence electrons.) [spring 02, ex 1]



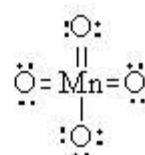
(a)



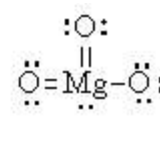
(b)



(c)



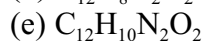
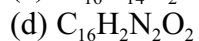
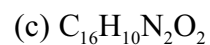
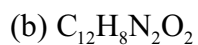
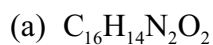
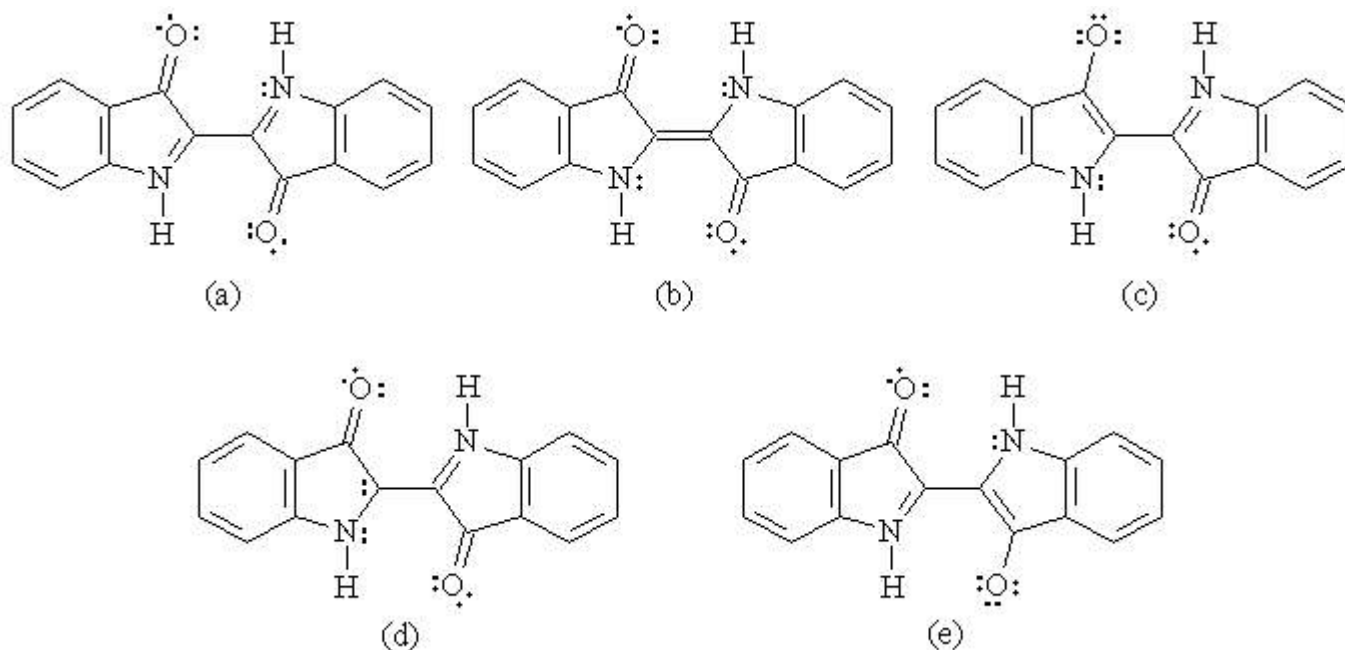
(d)



(e)

Resonance structures of “indigo” drawn in C framework format are shown below. (Indigo is the blue dye in blue jeans.) Consider these for the next 4 questions. All lone pairs are shown for clarity. [fall 01, ex 1]

13. What is the molecular formula of indigo? (All structures give the same answer.)



14. Which one of the resonance structures can't exist?

15. Which one is the best structure?

16. Which two are completely equivalent (equally good/bad) resonance structures? Mark two answers on your scantron.

17. What is the VSEPR geometry about S in SF_4 ?

[fall 01, ex1]

(a) octahedral

(b) trigonal planar

(c) tetrahedral

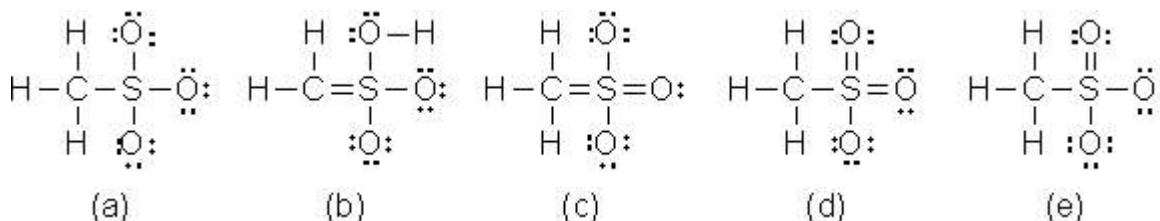
(d) trigonal bipyramidal

(e) linear

18. What is the F-Xe-F bond angle in XeF₄? [spring 01, ex 1]

- (a) 60° (b) 90° (c) 109° (d) 120° (e) 180°

Consider the following Lewis structures for a -1 anion with molecular formula CH₃O₃S for the next 4 questions. All the structures have the same number of electrons. [spring 01, ex 1]



19. Which one of the Lewis structures can't possibly be correct?

20. Which one is the best Lewis structure?

21. Which one of the Lewis structures is not a resonance structure of the others?

22. How many resonance structures can be written that are completely equivalent to structure (e)? Include structure (e) in the total.

- (a) 1 (b) 2 (c) 3 (d) 4 (e) 6

23. How many different non-cyclic organic compounds have molecular formula C₂H₅N? [fall 01, ex1]

- (a) 1 (b) 2 (c) 3 (d) 4 (e) 5

Answers: 1 d, 2 b, 3 a, 4 c, 5 e, 6 c, 7 a, 8 b, 9 cd, 10 e, 11 e, 12 d, 13 c, 14 a, 15 b, 16 ce, 17 d, 18 e, 19 c, 20 d, 21 b, 22 c, 23 c.