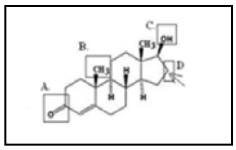
Table displaying the nine questions, the average difficulty and average discrimination of each question, and the average % of students who chose a particular response.

1. How many hydrogens are bonded to the element D.? Provide a number answer.



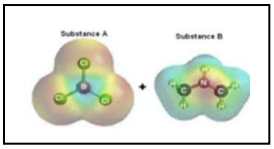
% Difficulty	Discrimination	Response				
44	0.44	0	1	*2	3	4
Question 1 % chosen		20.5	17.9	46.1	12.8	2.5

2. How many lone pairs of electrons are represented in the Lewis dot structure of phosphorus?

a. 0
*b. 1
c. 2
d. 3

% Difficulty	Discrimination	Response			
34.5	0.42	0	*1	2	3
Question 2 % chosen		0	31.5	18.4	50

3. and 4. Consider the following images to answer the questions that follow.



3. Electrons would be transferred from substance
A to substance B
*B to substance A

% Difficulty	Discrimination	Response	
65	0.54	A to B	*B to A
Question 3 % chosen		31.9	68.1

4. How many products are formed from the reaction of substance A and substance B?

*a. 1
b. 2
c. 3
d. 4

% Difficulty	Discrimination	Response			
36.4	0.39	*1	2	3	4
Question 4 % chosen		37.7	57.7	4.4	0

6. Which of the following statements about propene, $CH_3CH=CH_2$, is correct?

a. All nine atoms lie in the same plane.
b. The compound has a cis and trans isomer.
c. It generally acts as a Lewis acid.
*d. There are a total of eight sigma bonds.
e. All the carbon atoms are sp^2 hybridized.

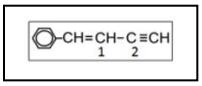
% Difficulty	Discrimination	Response				
65.1	0.43	a	b	c	*d	e
Question 6 % chosen		0	20.5	15.3	61.5	2.5

7. All of the following statements about ethene, C_2H_4, are correct EXCEPT

*a. The H-C-H bond angles are approximately 109.5°.
b. All of the hydrogen atoms are in the same plane.
c. There are a total of five sigma bonds.
d. The carbon atoms are sp^2 hybridized.
e. The H-C-H bond angles are approximately 120°.

% Difficulty	Discrimination	Response				
59.5	0.49	*a	b	c	d	e
Question 7 % chosen		55.2	2.6	2.6	7.8	34.2

12. What is the hybridization of the carbon atoms numbered 1 and 2, respectively, in the following structure?



a. sp^3, sp^2
b. sp^2, sp^2
c. sp, sp
*d. sp^2, sp
e. sp, sp^2

% Difficulty	Discrimination	Response				
50.8	0.48	a	b	c	*d	e
Question 12 % chosen		21.0	5.2	13.1	47.3	13.1

13. The compound methylamine, CH_3NH_2, contains a C-N bond. In this bond, which of the following best describes the charge on the nitrogen atom.

a. +1
b. slightly positive
c. uncharged
*d. slightly negative
e. -1

% Difficulty	Discrimination	Response				
64.5	0.55	a	b	c	*d	e
Question 13 % chosen		5.7	8.5	14.2	68.5	0

14. Which of the following statements about multiple bonds is true?

a. A double bond consists of two sigma bonds.
b. A sigma bond results from the side-on overlap of p atomic orbitals.
c. A pi bond results from the head-on overlap of p atomic orbitals.
*d. sp^2 hybridization in carbon is associated with one double bond and two single bonds.
e. A triple bond consists of three pi bonds

% Difficulty	Discrimination	Response				
64.6	0.79	a	b	c	*d	e
Question 14 % chosen		4.0	4.0	8.0	68	24.0

Textbook[a] Chapter Numbers and Titles Covered in the Course

Chapter	Chapter Title
1	Structure and Bonding: Acids and Bases
2	Alkanes: The Nature of Organic Compounds
3	Alkenes and Alkynes: The Nature of Organic Reactions
4	Reactions of Alkenes and Alkynes
5	Aromatic Compounds
6	Stereochemistry at Tetrahedral Centers
7	Organohalides: Nucleophilic Substitutions and Eliminations
8	Alcohols, Phenols, Ethers, and Their Sulfur Analogs
9	Aldehydes and Ketones: Nucleophilic Addition Reactions
10	Carboxylic Acids and Derivatives: Nucleophilic Acyl Substitution Reactions
11	Carbonyl Alpha-Substitution Reactions and Condensation Reactions
12	Amines

[a] This organic chemistry course uses *Fundamentals of Organic Chemistry*