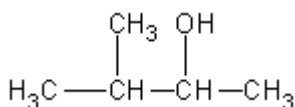
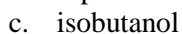
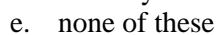
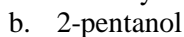
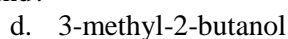
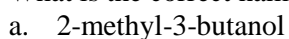


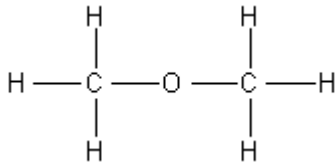
8.



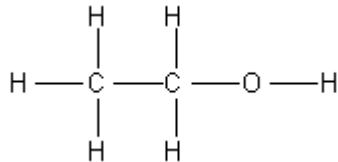
What is the correct name for the above compound?



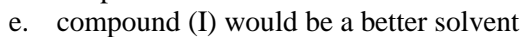
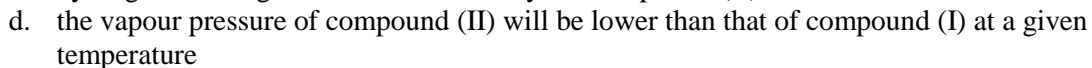
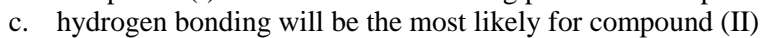
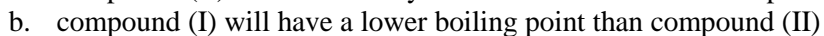
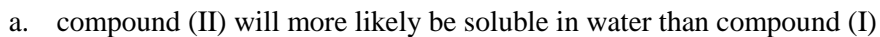
9. Which statement is incorrect concerning these two molecules with the same formula, $\text{C}_2\text{H}_6\text{O}$?



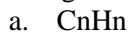
I.



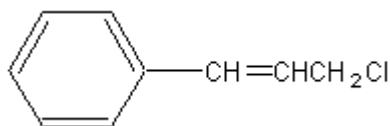
II.



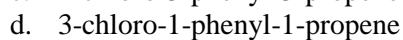
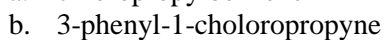
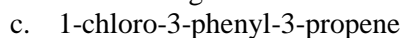
10. The general formula for a cycloalkane can be represented by which of the following?



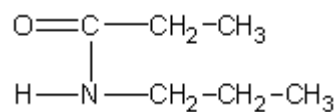
11.



The correct name for compound above is which of the following?



12.



The correct name for the compound given above is which of the following?

- a. 3-amino-3-hexanone c. N-propylpropanamide
b. ethyl ethanamide d. N-ethylethanamide

13.



The correct name for the compound given above is which of the following?

- a. 1,3-cyclopentadiene c. 1,4-cyclopentene
b. 1,4-cyclopentadiene d. 1,3-cyclopentene

14. Of the five names listed below, four contain deliberate errors. Which is the only name is correct?

- a. 2-pentanal d. 1,2-dimethylpropanoate
b. 2,3-dichloropentane e. n-methylpropanamide
c. 3-methylpropanoic acid

15. The reaction of $\text{CH}_3\text{CH}=\text{CH}-\text{CH}=\text{CH}_2$ with excess bromine gives chiefly

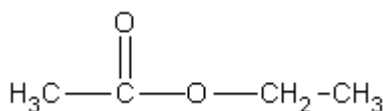
- a. 1,2-dibromo-3-pentene
b. 3,4-dibromo-1-pentene
c. 1,4-dibromo-2-pentene
d. a mixture of the above three compounds
e. none of the above three compounds

16. The number of isomers of chlorodibromobenzene is which of the following?

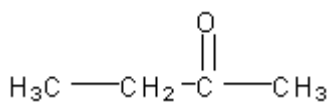
- a. three d. six
b. four e. seven
c. five

17. The formula for methyl ethanoate is which of the following?

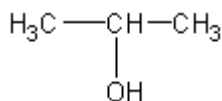
a.



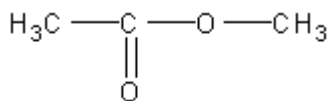
c.



b.

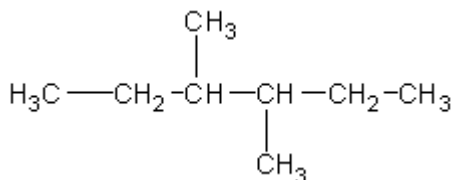


d.

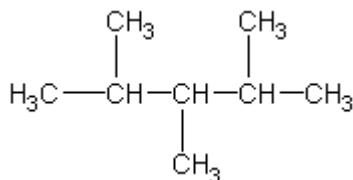


18. The condensed formula of 2,3,4-trimethylpentane is which of the following?

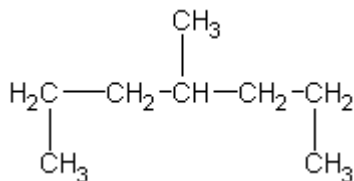
a.



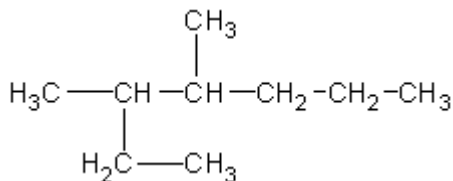
c.



b.



d.



19.

- ___ 27. Which group of these compounds tends to be the most reactive?
- alkanes
 - alkenes
 - alkynes
 - aromatics
- ___ 28. When excess hydrogen bromide is added to pentyne, the possible product is which of the following?
- 1,1-dibromopentane
 - 1,2-dibromopentane
 - 1,1,2,2-tetrabromopentane
 - 2,2-dibromopentane

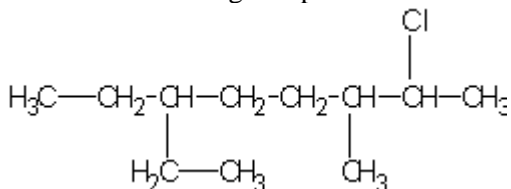
- ___ 29. The primary product of the reaction below which uses excess HBr is which of the following?



-
-
-
-

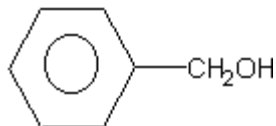
- ___ 30. Butane and fluorine gas would react by which of the following?
- addition
 - combustion
 - substitution
 - single displacement
- ___ 31. The compound with the highest boiling point will be which of the following?
- CH₃Cl
 - CH₃Br
 - CH₄
 - CH₃F

- ___ 32. Name the following compound:



- 2-chloro-6-ethyl-3-methyloctane
- 2-chloro-6-ethyl-3-methyldecane
- 2-chloro-6-methyl-3-ethyloctane
- 2-chloro-6-propyl-3-methyloctane
- 2-chloro-6-ethyl-3-methylheptane

- ___ 33. The alcohol below is classified as which of the following?

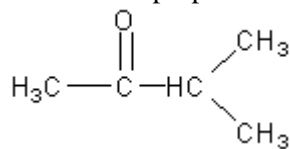


- primary alcohol
- secondary alcohol
- tertiary alcohol
- aromatic alcohol

- ___ 34. Which one of the following compounds is not expected to be completely soluble in water at room temperature?
- CH₃CH₂CH₂OH
 - CH₃CO₂H
 - CH₃(CH₂)₁₆CO₂H
 - CH₃OH

- ___ 35. Esters are
- found in some medicines
 - often fragrant
 - essential oils in fruits and flower
 - found in some types of flavorings
 - all of the above

36. What is the proper name for the structure given below?



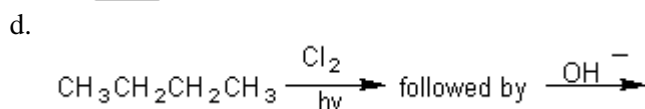
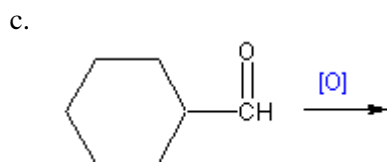
- a. 3-methyl-2-butanone
 b. 3-pentanone
 c. 1-ethyl-1-propanone
 d. 1,1-dimethyl-1-propanone

37. Select the compound with the highest boiling point at standard pressure.

- a. CH_4
 b. $\text{CH}_3\text{CH}_2\text{CH}_3$
 c. $\text{CH}_3\text{CH}_2\text{OH}$
 d. $\text{HOCH}_2\text{CH}_2\text{OH}$
 e. $\begin{array}{c} \text{H}_3\text{C}-\text{CH}-\text{CH}_3 \\ | \\ \text{OH} \end{array}$

38. As a chemist in an automotive research company, you are asked to make a substitute for ethylene glycol, the major component of antifreeze used in cars. Which of these reactions would you use to provide a product that has similar properties?

- a. $\text{H}_3\text{C}-\text{CH}=\text{CH}_2 + \text{HBr}$
 b. $\text{H}_3\text{C}-\text{CH}=\text{CH}-\text{CH}_3 + \text{H}_2\text{O} \longrightarrow$

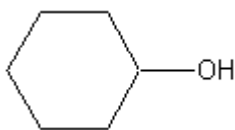


Unknown	B.P	Red Litmus Paper	Blue Litmus Paper	Odour	Solubility in H ₂ O	Reaction with an oxidizer
I	48°C	Turns blue	No reaction	Fishy smell	Yes	Weak reaction
II	161°C	No reaction	Slightly red	None	Yes	Vigorous reaction
III	38°C	No reaction	No reaction	None	No	Weak reaction
IV	164°C	No reaction	Turns red	Unpleasant, rancid odour	Yes	No reaction

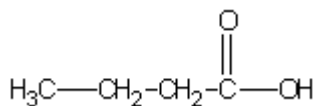
39. A forensic scientist is trying to identify the functional groups in some unknowns. After several tests, she produces the above chart. Unknown I is most likely which of the following?

- a. $\text{CH}_3\text{CH}_2\text{Br}$
 d.

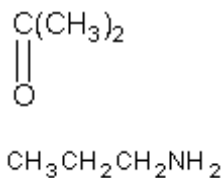
b.



c.

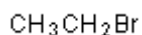


e.

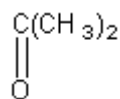


40. A forensic scientist is trying to identify the functional groups in some unknowns. After several tests, she produces the above chart. Unknown II is most likely which of the following?

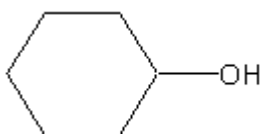
a.



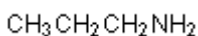
d.



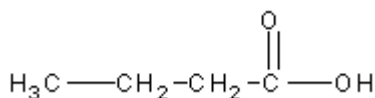
b.



e.



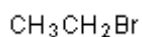
c.



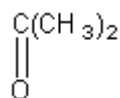
41. A forensic scientist is trying to identify the functional groups in some unknowns. After several tests, she produces the above chart:

Unknown III is most likely which of the following?

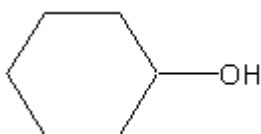
a.



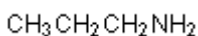
d.



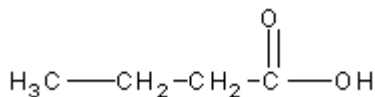
b.



e.

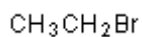


c.

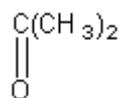


42. A forensic scientist is trying to identify the functional groups in some unknowns. After several tests, she produces the above chart. Unknown IV is most likely which of the following?

a.

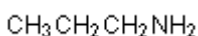


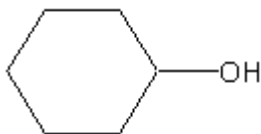
d.



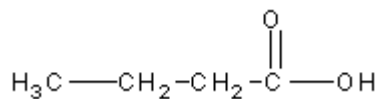
b.

e.

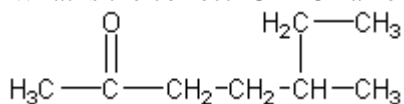




c.



43. What is the correct IUPAC name for compound below?



a. 2-ethyl-5-hexanone

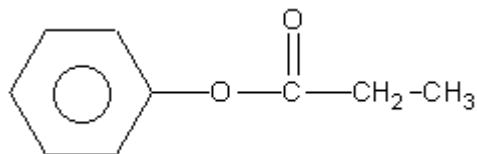
b. 5-ethyl-2-hexanone

c. 3-methyl-6-heptanone

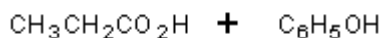
d. 5-methyl-2-heptanone

e. 2-heptanone

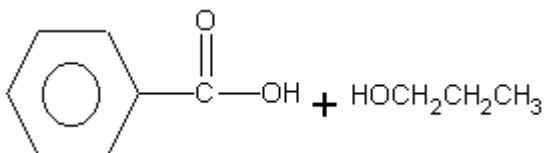
44. In order to prepare the molecule shown below, which organic compounds must a chemist react under the appropriate catalyst/conditions?



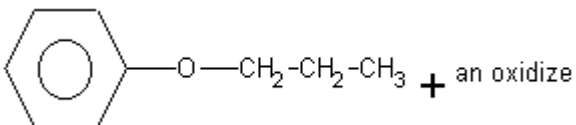
a.



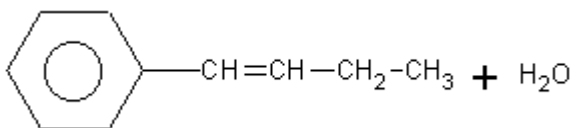
b.



c.



d.



45. Which statement below is incorrect?

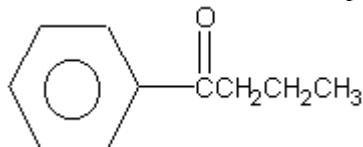
a. the smallest aldehyde has the formula HCOH

b. a carbonyl carbon consists of a carbon-oxygen double bond

c. in an aldehyde, the carbonyl carbon is always bonded to a hydrogen atom

d. Ketones are more soluble in water than alcohols with the equivalent number of carbons

46. The correct name for the compound given below is which of the following?



a. 1-phenyl-1-butanone

b. phenylbutanal

c. 4-phenyl-4-butanone

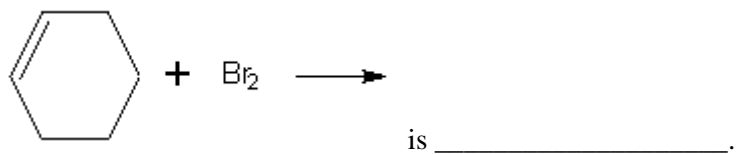
d. butanonebenzene

- ___ 47. The functional group of a molecule does not affect a compound's
- solubility
 - melting point
 - reaction with other molecules
 - carbon chain length
- ___ 48. Which compound is most likely to be a gas at room temperature?
- propane
 - 2-chloropropane
 - propanal
 - propanone
- ___ 49. From the following list, select the two molecules that are isomers:
- $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_3$
 - $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}(\text{CH}_3)_2$
 - $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_3$
 - $\text{CH}_3\text{CH}_2\text{CH}_2\text{-C}(\text{CH}_3)_2$
- (1) and (2) only
 - (1) and (3) only
 - (1) and (4) only
 - (2) and (3) only
 - (2) and (4) only
- ___ 50. Which of the following compounds is a secondary alcohol?
- 1-pentanol
 - 2-pentanol
 - 2-pentanone
 - 2-methyl-2-butanol
- ___ 51. Which of the following compounds is an isomer of the other three identical molecules?
- $$\begin{array}{c} \text{CH}_3 \\ | \\ \text{H}_3\text{C}-\text{CH}_2-\text{CH}_2-\text{CH}-\text{CH}_3 \end{array}$$
 - $$\begin{array}{c} \text{CH}_3 \quad \text{CH}_3 \\ | \quad | \\ \text{HC}-\text{CH}_2-\text{CH}_2 \\ | \\ \text{CH}_3 \end{array}$$
 - $$\begin{array}{c} \text{H}_3\text{C}-\text{CH}-\text{CH}_2-\text{CH}_2-\text{CH}_3 \\ | \\ \text{CH}_3 \end{array}$$
 - $$\begin{array}{c} \text{H}_3\text{C}-\text{CH}_2-\text{CH}-\text{CH}_2-\text{CH}_3 \\ | \\ \text{CH}_3 \end{array}$$
- ___ 52. The symbol shown below is which of the following?
- $$\begin{array}{c} \text{H} \quad \text{H} \quad \text{O} \\ | \quad | \quad || \\ \text{H}-\text{N}-\text{C}-\text{C}-\text{OH} \\ | \\ \text{H} \end{array}$$
- an empirical formula
 - a molecular formula
 - a structural formula
 - a stick formula
- ___ 53. Carbon is able to form large numbers of organic compounds because carbon can
- form 4 bonds
 - form single, double and triple bonds
 - form chains, rings, spheres and sheets
 - the carbon-carbon bond is very stable
 - all of the above

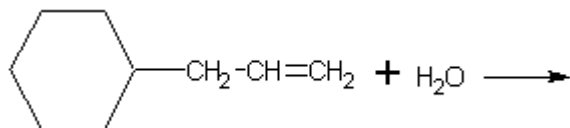
Completion

Complete each statement.

54. The structure of the compound produced by this reaction:

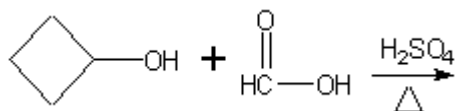


55. The primary reaction product of the reaction given below is _____.



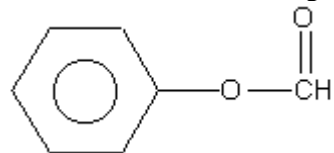
56. When exposed to light and $\text{Cl}_2(\text{g})$, cyclopentane will react to form _____.

57. The correct IUPAC name for the compound formed by the reaction below is _____.



Short Answer

58. Write the reaction showing how the ester.



, can be prepared from a carboxylic acid and an alcohol. Provide the names of all reactants below your equation.

Essay

59. Large factories with immense storage tanks, noxious fumes, and pipes draining dangerous fluids into clean streams is the perception many people in the general public have when asked about the chemical industry. They frequently associate these factories with the pollution and hazards surrounding modern chemical usage. In the past two decades, tough legislation has made many chemical factories much safer. In fact, 'household chemical uses' poses a greater potential for personal risk and environmental pollution in many cases. The average consumer handles a plethora of organic chemicals. Describe some of the **organic** chemicals commonly used around a household, general precautions that should be observed by citizens to reduce their risks, and alternative methods to reduce their overall consumption.
60. Our modern Western society relies heavily on organic compounds. Many improvements have been made in these products to assist in solving new health, environmental and safety concerns. Describe several of these innovations.

Organic Review Test Answer Section

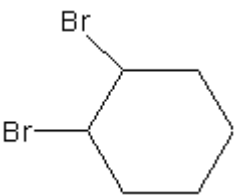
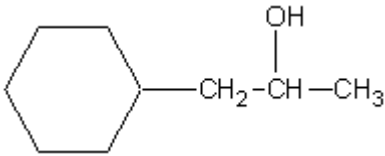
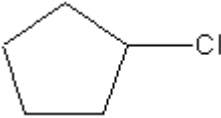
MULTIPLE CHOICE

- | | | | | |
|-----|-----------------------|--------|----------|----------|
| 1. | ANS: B
STA: OC1.01 | PTS: 1 | REF: K/U | OBJ: 1.8 |
| 2. | ANS: D
STA: OC1.01 | PTS: 1 | REF: K/U | OBJ: 1.5 |
| 3. | ANS: E
STA: OC1.01 | PTS: 1 | REF: K/U | OBJ: 1.2 |
| 4. | ANS: A
STA: OC2.02 | PTS: 1 | REF: C | OBJ: 1.2 |
| 5. | ANS: D
STA: OC2.02 | PTS: 1 | REF: C | OBJ: 1.2 |
| 6. | ANS: C
STA: OC1.01 | PTS: 1 | REF: K/U | OBJ: 1.6 |
| 7. | ANS: C
STA: OC1.01 | PTS: 1 | REF: K/U | OBJ: 1.5 |
| 8. | ANS: D
STA: OC2.02 | PTS: 1 | REF: C | OBJ: 1.5 |
| 9. | ANS: D
STA: OC1.02 | PTS: 1 | REF: K/U | OBJ: 1.5 |
| 10. | ANS: C
STA: OC1.01 | PTS: 1 | REF: K/U | OBJ: 1.2 |
| 11. | ANS: D
STA: OC2.02 | PTS: 1 | REF: C | OBJ: 1.2 |
| 12. | ANS: C
STA: OC2.02 | PTS: 1 | REF: C | OBJ: 1.8 |
| 13. | ANS: A
STA: OC2.02 | PTS: 1 | REF: C | OBJ: 1.2 |
| 14. | ANS: B
STA: OC2.02 | PTS: 1 | REF: C | OBJ: 1.8 |
| 15. | ANS: D
STA: OC2.05 | PTS: 1 | REF: C | OBJ: 1.3 |
| 16. | ANS: D
STA: OC2.01 | PTS: 1 | REF: C | OBJ: 1.2 |
| 17. | ANS: D
STA: OC2.02 | PTS: 1 | REF: C | OBJ: 1.7 |
| 18. | ANS: C
STA: OC2.02 | PTS: 1 | REF: C | OBJ: 1.2 |
| 19. | ANS: B
STA: OC2.02 | PTS: 1 | REF: C | OBJ: 1.7 |
| 20. | ANS: A
STA: OC2.02 | PTS: 1 | REF: C | OBJ: 1.2 |
| 21. | ANS: A
STA: OC2.02 | PTS: 1 | REF: C | OBJ: 1.2 |
| 22. | ANS: D
STA: OC2.02 | PTS: 1 | REF: C | OBJ: 1.6 |
| 23. | ANS: D | PTS: 1 | REF: C | OBJ: 1.6 |

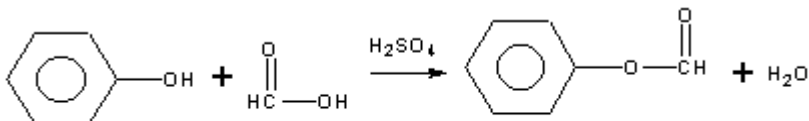
	STA: OC2.02			
24.	ANS: D	PTS: 1	REF: C	OBJ: 1.2
	STA: OC2.02			
25.	ANS: B	PTS: 1	REF: C	OBJ: 1.7
	STA: OC2.02			
26.	ANS: B	PTS: 1	REF: K/U	OBJ: 1.1
	STA: OC1.01			
27.	ANS: C	PTS: 1	REF: K/U	OBJ: 1.3
	STA: OC1.03			
28.	ANS: D	PTS: 1	REF: C	OBJ: 1.3
	STA: OC2.05			
29.	ANS: C	PTS: 1	REF: C	OBJ: 1.3
	STA: OC2.05			
30.	ANS: C	PTS: 1	REF: K/U	OBJ: 1.4
	STA: OC1.03			
31.	ANS: D	PTS: 1	REF: K/U	OBJ: 1.4
	STA: OC1.02			
32.	ANS: A	PTS: 1	REF: C	OBJ: 1.4
	STA: OC2.02			
33.	ANS: A	PTS: 1	REF: K/U	OBJ: 1.5
	STA: OC1.01			
34.	ANS: C	PTS: 1	REF: K/U	OBJ: 1.7
	STA: OC1.02			
35.	ANS: E	PTS: 1	REF: K/U	OBJ: 1.7
	STA: OC1.02			
36.	ANS: A	PTS: 1	REF: C	OBJ: 1.7
	STA: OC2.02			
37.	ANS: D	PTS: 1	REF: K/U	OBJ: 1.5
	STA: OC1.02			
38.	ANS: B	PTS: 1	REF: I	OBJ: 1.5
	STA: OC2.05			
39.	ANS: E	PTS: 1	REF: I	OBJ: 1.8
	STA: OC1.02			
40.	ANS: A	PTS: 1	REF: I	OBJ: 1.4
	STA: OC1.02			
41.	ANS: D	PTS: 1	REF: I	OBJ: 1.6
	STA: OC1.02			
42.	ANS: C	PTS: 1	REF: I	OBJ: 1.7
	STA: OC1.02			
43.	ANS: D	PTS: 1	REF: C	OBJ: 1.6
	STA: OC2.02			
44.	ANS: A	PTS: 1	REF: C	OBJ: 1.7
	STA: OC2.05			
45.	ANS: D	PTS: 1	REF: K/U	OBJ: 1.6
	STA: OC1.01			
46.	ANS: A	PTS: 1	REF: C	OBJ: 1.6
	STA: OC2.02			
47.	ANS: D	PTS: 1	REF: C	OBJ: 1.1
	STA: OC2.01			
48.	ANS: A	PTS: 1	REF: K/U	OBJ: 1.1
	STA: OC1.02			
49.	ANS: E	PTS: 1	REF: K/U	OBJ: 1.2

- STA: OC1.01
50. ANS: B PTS: 1 REF: K/U OBJ: 1.5
 STA: OC1.01
51. ANS: D PTS: 1 REF: K/U OBJ: 1.2
 STA: OC1.01
52. ANS: C PTS: 1 REF: K/U OBJ: 1.1
 STA: OC1.01
53. ANS: E PTS: 1 REF: K/U OBJ: 1.1
 STA: OC1.01

COMPLETION

54. ANS: 
- PTS: 1 REF: C OBJ: 1.3 STA: OC2.05
55. ANS: 
- PTS: 1 REF: C OBJ: 1.3 STA: OC2.05
56. ANS: chlorocyclopentane
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- PTS: 1 REF: C OBJ: 1.4 STA: OC2.05
57. ANS: cyclobutylmethanoate
- PTS: 1 REF: C OBJ: 1.7 STA: OC2.05

SHORT ANSWER

58. ANS: 
- (phenol) (methanoic acid)
 (hydroxybenzene) (formic acid)
- PTS: 1 REF: C OBJ: 1.7 STA: OC2.05

ESSAY

59. ANS:

answers will vary

- dangers to individuals include organic chemicals which are toxic, flammable and irritating
- exposure can cause allergic responses, poisoning, sickness, cancer
- precautions for storage: keep in the original container; keep for only the prescribed length of time; store in a cool, dry place; check for leaks
- precautions for use: do not mix different products, use the recommended strength, avoid splashing, read instructions, retain labels, close containers, use in ventilated areas, secure lids, finish product before purchasing more, keep locked away from children
- some household organic products and possible alternative include:
- oil based paints: use water (latex) products
- paint and varnish removers: use a scrapper/sandpaper
- herbicides: pull weeds by hand, live with weeds, use dish detergent solution- insecticides: use insecticidal soap, eliminate excessive moisture, only use small quantities (give rise to resistance), use repellents such as boric acid
- pool chemicals: use ozone or UV light system, adjust to proper pH
- auto products: bring waste to a proper recycling facility for disposal
- mothballs: use cedar ball
- drain cleaners: use a mechanical snake
- house cleaners: vinegar, baking soda

PTS: 1

REF: MC

OBJ: 1.1

STA: OC3.02

60. ANS:

answers will vary

- farmers use the potency of pheromones to attract and kill insects as an alternative to pesticides
- HFCs are replacing CFCs as propellants, since they do not contain chlorine and will damage the ozone layer
- synthesis of polymers for high density optical storage
- use of unleaded gasoline in place of leaded gasoline
- alterations in transparent polymers to prevent damage from lasers in pilots eyes, improve optical networks
- use of recyclable organic products in packaging and automotive products
- preservatives in foods to prevent spoilage
- biodegradable pesticides in place of long lasting alkyl organics such as DDT
- improved analytical testing for organic compounds in our bodies (e.g., hormone levels, proteins)
- newly synthesized antibiotics to fight disease
- alternative medicines: use of aldehydes in aromatherapy
- production of new artificial sweeteners such as saccharin to help diabetics, people on diets in place dangerous products such as aspartame

PTS: 1

REF: MC

OBJ: 1.9

STA: OC3.04