

Part 2 of Ch. 22-23 Unit  
AP Review Questions

Organic Chemistry

1) Which of the following is an example of an alkene?

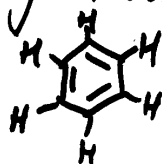
- a)  $\text{CH}_3\text{CH}_2\text{CH}_2\text{CCH}$   
 b)  $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_2\text{CHCH}_2$   
 c)  $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_3$   
 d)  $\text{C}_6\text{H}_6$   
 e)  $\text{CH}_3\text{CH}_2\text{-O-CH}_2\text{CH}_3$

1)  $\text{CH}_3\text{CH}_2\text{CH}_2\text{-C}\equiv\text{CH}$  alkyne

$\text{CH}_3\text{CH}_2\cdots\text{CH}_2\text{-CH=CH}_2$  alkene (b)

all others have single bonds  
except  $\text{C}_6\text{H}_6$

(trialkyne)



2) Which of the following functional groups represents an organic acid?

- a)  $-\text{COOH}$  b)  $-\text{OH}$  c)  $-\text{NH}_2$   
 d)  $-\text{CHO}$  e)  $-\text{SH}$

2) carboxylic acid =  $-\overset{\text{O}}{\parallel}{\text{C}}-\text{OH}$   
 $-\text{CO}_2\text{H}$   
 $-\text{COH}$  (a)

3) Which of the following represents the general formula for an aldehyde?

- a)  $\text{ROH}$  b)  $\text{ROR}'$  c)  $\text{RCOOH}$   
 d)  $\text{RCHO}$  e)  $\text{RSH}$

3) aldehyde =  $-\overset{\text{O}}{\parallel}{\text{C}}-\text{H}$   
 $-\text{CHO}$  (d)

( $-\text{COH} = \text{alcohol}$ )

4) Alkanes can be represented by which of the following general formulas?

- a)  $\text{C}_n\text{H}_{2n}$  b)  $\text{C}_n\text{H}_{2n-2}$  c)  $\text{C}_n\text{H}_{2n+2}$   
 d)  $\text{C}_n\text{H}_{2n+1}$  e)  $\text{C}_n\text{H}_{2n-1}$

4) alkane  $\text{C}_n\text{H}_{2n+2}$  (c)

alkene  $\text{C}_n\text{H}_{2n}$

alkyne  $\text{C}_n\text{H}_{2n-2}$

5) Which of the following is the general formula for an alkene?

- a)  $\text{C}_n\text{H}_{2n}$  b)  $\text{C}_n\text{H}_{2n-2}$  c)  $\text{C}_n\text{H}_{2n+2}$   
 d)  $\text{C}_n\text{H}_{2n-4}$  e)  $\text{C}_n\text{H}_{2n+2}\text{O}$

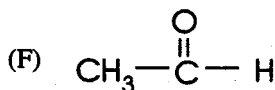
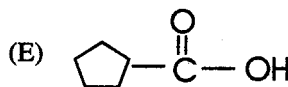
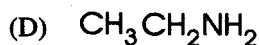
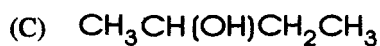
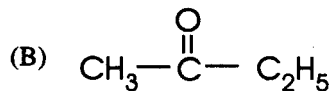
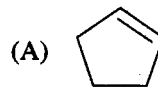
5) alkene (a)  $\text{C}_n\text{H}_{2n}$

6) Which of the following is the general formula for alcohols?

- a)  $\text{ROH}$  b)  $\text{ROR}'$  c)  $\text{RCOOH}$   
 d)  $\text{RCHO}$  e)  $\text{ROOR}$


6) alcohol  $-\text{C-O-H}$   
 $-\text{COH}$  (a)

Questions 7-12



- 7) An example of alkene  
 8) An example of carboxylic acid  
 9) An example of alcohol  
 10) An example of amine  
 11) An example of ketone  
 12) An example of aldehyde

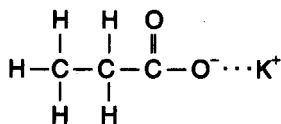
7-12

- 7) alkene  [a]  
 8) carboxylic acid  $-\overset{\text{O}}{\parallel}{\text{C}}-\text{OH}$  [e]  
 9) alcohol  $\text{CH}_3-\overset{\text{OH}}{\text{CH}}-\text{CH}_2\text{CH}_3$  [c]  
 10) amine  $-\text{NH}_2$  [d]  
 11) ketone  $\text{C}-\overset{\text{O}}{\parallel}{\text{C}}-\text{C}$  [b]  
 12) aldehyde  $-\overset{\text{O}}{\parallel}{\text{C}}-\text{H}$  [f]

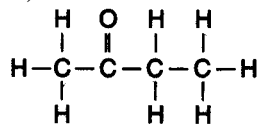
Questions 13-17

- a) amide b) amine c) ketone  
 d) thiol e) salt

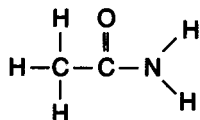
13)



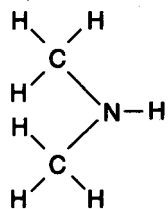
14)



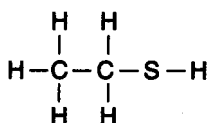
15)



16)



17)



13-17

- 13)  $-\overset{\text{O}}{\parallel}{\text{C}}-\text{O}^{\ominus}\text{K}^{\oplus}$  carboxylic acid salt [e]

H<sup>+</sup> replaced with K<sup>+</sup>

- 14)  $\text{C}-\overset{\text{O}}{\parallel}{\text{C}}-\text{C}$  ketone [c]

- 15)  $-\text{C}-\overset{\text{O}}{\parallel}{\text{C}}-\text{N}^-$  amide [a]

- 16)  $\text{C}-\text{N}-\text{H}$  amine [b]

- 17)  $\text{C}-\text{S}-\text{H}$  thiol [d]

( $\text{SCN}^{\ominus}$  thiocyanide ion)

like a sulfur alcohol

18) Which of the following is most probably an optically active organic compound?

- a) acetic acid b) *trans*-2-butene  
 c) para-dichlorobenzene  
 d) 2-bromo-2-chlorobutane  
 e) chloroform

18) *trans*-2-butene [b]

You can also have *cis*-2-butene  
 (bad question: not really optical isomers)

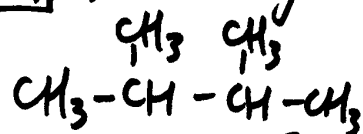
19) Which of the following is an isomer of n-hexane?

- a) 2,3-dimethyl butane
- b) 2-methyl butane
- c) 2,2-dimethylpropane
- d) 2,3-dimethyl pentane
- e) 3-ethyl-2-methylpentane

19) n-hexane  $C_6H_{14}$   
 $C_n H_{2n+2}$

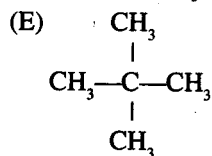
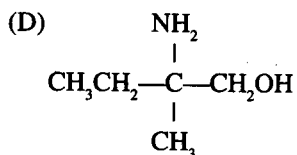
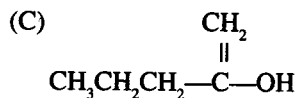
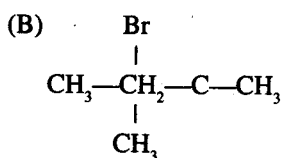
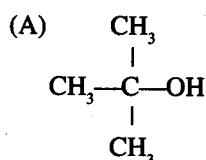
\*needs 6 carbons and all single bonds  
 $2 + 4 = 6$  carbons

**a)** 2,3-dimethyl butane

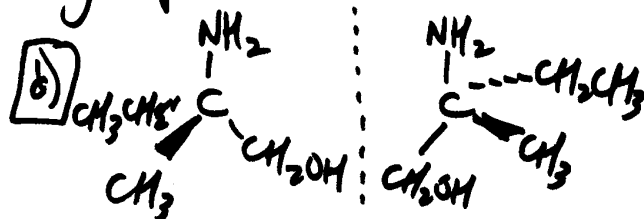


① ② ③ ④

20) Which of the following has an optical isomer?



20) Optical isomers are mirror images, they need 4 different groups on a Carbon atom.



Questions 21-23

- a)  $CH_4$    b)  $C_6H_6$  (benzene)
- c)  $CH_3CH_2COOH$
- d)  $CH_3CH_2OCH_2CH_3$
- e)  $CH_2=CH_2$

21) This compound is the monomer used to make polyethylene.

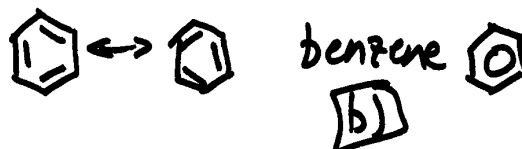
22) This compound is best described using resonance structures.

23) This compound has the lowest boiling point of those listed.

21-23

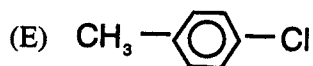
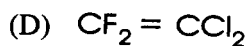
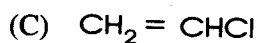
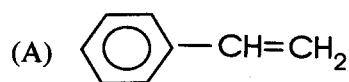
21) monomer of polyethylene is ethylene  
 many  $\rightarrow$   $\equiv$  ethylene  
**e)**  $H_2C=CH_2$

22) resonance



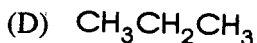
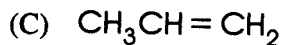
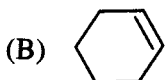
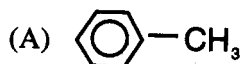
23) lowest boiling, lightest LDF  
**a)**  $CH_4$

24) Which of the following is used to produce polyvinylchloride (PVC)?



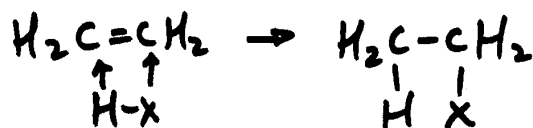
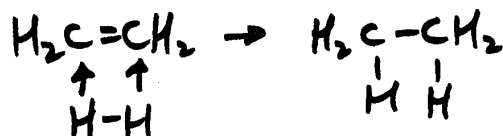
24) polyvinylchloride  
 many  
 monomer is vinylchloride  
 $\text{H}_2\text{C}=\text{CHCl}$  [C]

25) All of the following will undergo addition reaction with hydrogenhalide (HX) EXCEPT



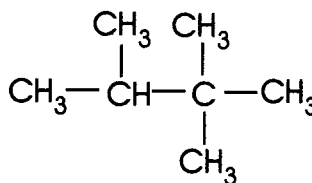
(E) Both (A) and (D)

25)  $\text{H}_2$  or  $\text{HX}$  will add across double bonds

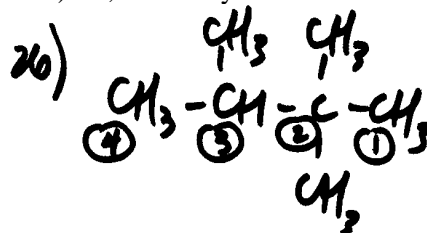


[d] has no double bonds  
 $\text{CH}_3-\text{CH}_2-\text{CH}_3$

26) Which of the following is the IUPAC name for



- a) 2,2,3-trimethylbutane
- b) isopropylbutane
- c) 3-isopropylpropane
- d) 2,2-dimethylpentane
- e) 2,3-dimethylbutane



2,2,3-trimethyl butane [a]

27) The structure for 3,4-dinitrobenzoic acid is which of the following?

