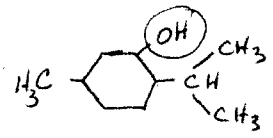
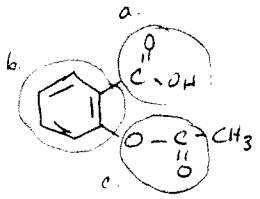
Advanced Chemistry - ch 12 Questions 19, 23, 24, 26, 29, 32, 33, 35, 39, 40

19. Organic cmpds → nonpolar molecules. C-H bonds (nonpolar) and geometry of carbon. No lone pairs

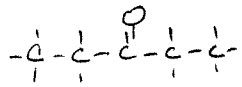
23. 

Menthol
- hydroxyl

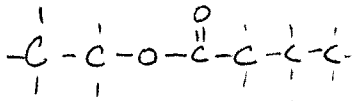


Aspirin
a. - carboxyl
b. Arene - (parent chain)
c. ester

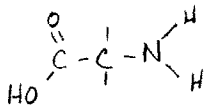
24. a) Ketone $C_5H_{10}O$ b) Ester $C_6H_{12}O$ c) $C_2H_5NO_2$ amine/carboxylic acid



pentanone

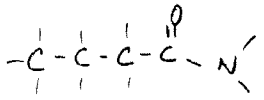


ethyl butanate



aminoethanoic acid
(aminoacetic acid)

d) amide
C_4H_9NO

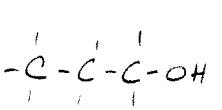


Butanamide

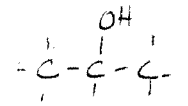
26. a branched chain has to contain a tertiary or quaternary carbon where straight chain a limited to primary and secondary carbons

29. primary - bonded to 1 other carbon
Secondary - bonded to 2 other carbons
tertiary - " 3 other carbons
quaternary - 4 other carbons

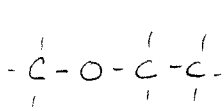
32. Isomers of C_3H_8O



1-propanol
n-propyl alcohol



2-propanol
sec-butyl alcohol

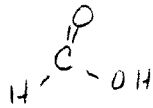


methoxy ethane

33. a) C_2H_7N b) C_4H_8 c) C_2H_4O d) CH_2O_2

$CH_3CH_2NH_2$ $CH_3CH{=}CHCH_3$ CH_3CHO

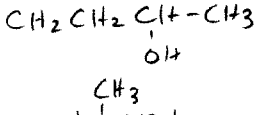
Ethanamine Butene Ethanal

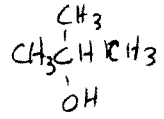

(formic acid)

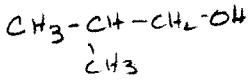
methanoic acid

$C_4H_{10}O$

35. a) 1. 1-butanol $CH_3CH_2CH_2OH$

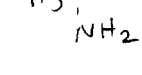
2. 2-butanol 

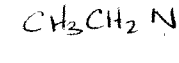
3. 2-methyl-2-propanol (tert butyl) 

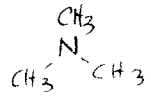
4. 2-methyl-1-propanol (isobutyl) 

b. amines of C_3H_9N

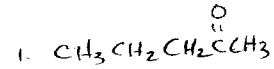
1. $CH_3CH_2CH_2NH_2$ - 1-propanamine (n-propylamine)

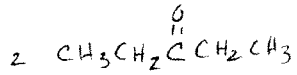
2.  2-propanamine (sec-propylamine) iso

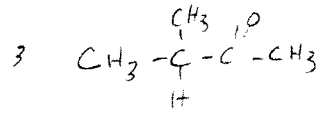
3.  N-methylethanamine

4.  Trimethylamine

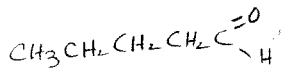
c) $C_5H_{10}O$ Ketone

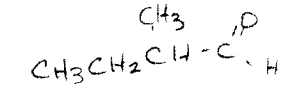
1. 

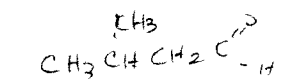
2. 

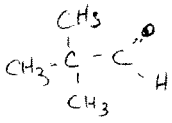
3. 

d) $C_5H_{10}O$ aldehyde

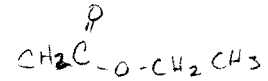


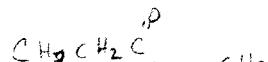


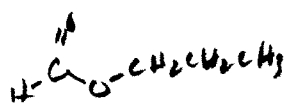




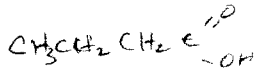
e) ester C_4H_8O

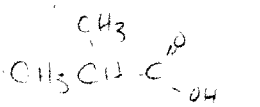






f) Carboxylic Acid $C_4H_8O_2$





39. a) 4-ethyl-3-methyloctane

b) 5-isopropyl-3-methyl octane 3-Methyl-5-isopropyloctane

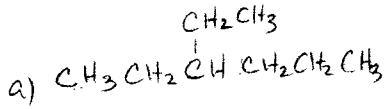
c) 2,2,6-trimethylheptane

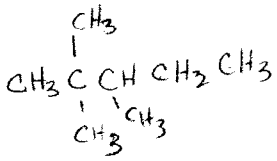
d) 4-isopropyl-4-methyl octane 4-methyl-4-isopropyl octane

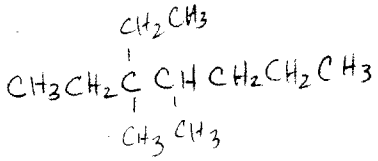
e) 2,2,44-tetramethylpentane

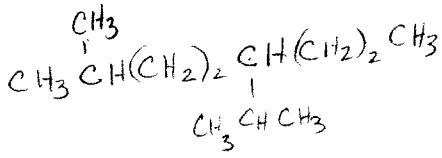
f) 4,4-diethyl-2-methylhexane

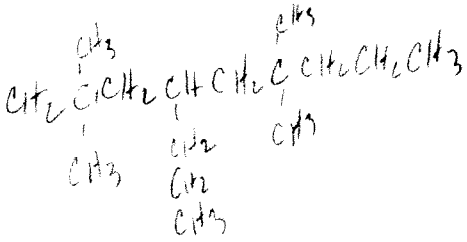
g) 2,2-dimethyl decane

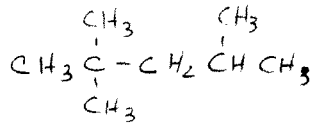
40. a) 

b) 

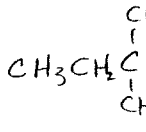
c) 

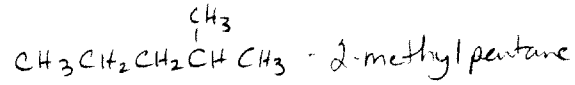
d) 

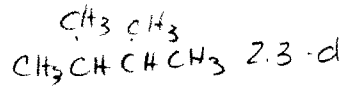
e) 

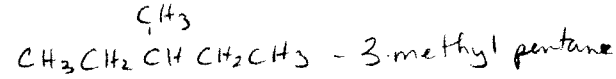
41 Isooctane  2,2,4-Trimethylpentane

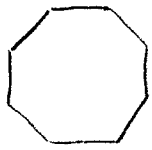
42. $CH_3CH_2CH_2CH_2CH_2CH_3$ - hexane

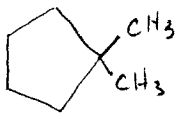
 2,2-dimethyl butane

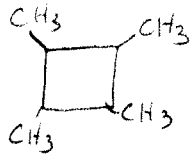
 - 2-methyl pentane

 2,3-dimethyl butane

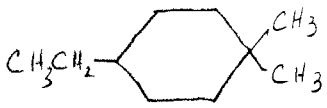
 - 3-methyl pentane

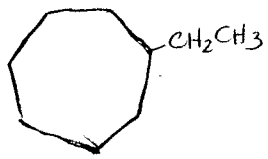
43. a)  cyclooctane

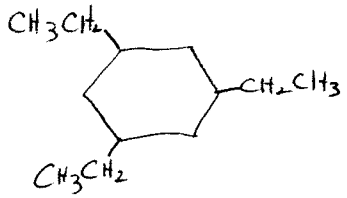
b.  1,1-dimethyl cyclopentane

a  1,2,3,4-tetramethyl cyclobutane

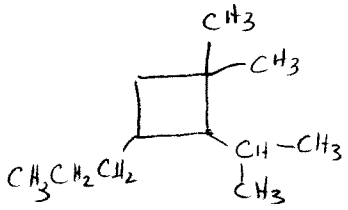
(1) (4,4)

d) 4-ethyl-1,1-dimethylcyclohexane 

e) ethylcycloheptane 

f) 1,3,5-Triethylcyclohexane 

(1) (3,3) (2)

g) 2-isopropyl-1,1-dimethyl-3-propylcyclobutane 

44 a) ~~1-methyl-1-propylcyclopentane~~ 1-isopropyl-1-methylcyclopentane

b) 1,1,3,3-Tetramethylcyclopentane

c) propylcyclohexane

d) 4-butyl-1,1-dimethylcyclohexane

e) ethyl cyclooctane

f) 1,2-Diethyl-3-methyl cyclopropane

g) 1-ethyl-2-methyl-5-propylcyclopentane

45.) a) 2.2-Dimethylpentane (No Di)

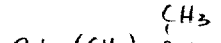
b) 3,5-Dimethyl heptane (hexane is not the longest chain)

c) Isobutyl cyclobutane (cyclobutane is the parent chain)

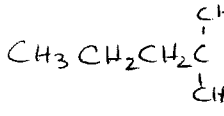
46. C_7H_{16}

$CH_3(CH_2)_5CH_3$ - heptane

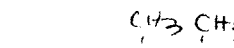
- 2-methyl hexane



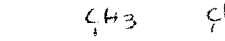
- 3-methyl hexane



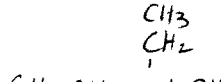
- 2,2-Dimethyl pentane



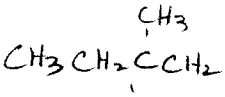
2,3-Dimethyl pentane



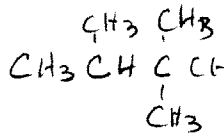
2,4-Dimethyl pentane



3-ethyl pentane



3,3-Dimethyl pentane



2,2,3-trimethyl butane

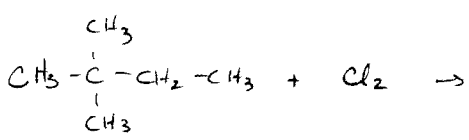
Ch 12 47-52

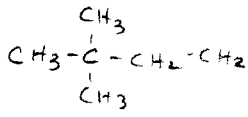
47. $C_3H_8 + 5O_2 \rightarrow 3CO_2 + 4H_2O$

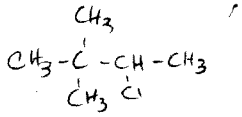
48. $2C_8H_{18} + 25O_2 \rightarrow 16CO_2 + 18H_2O$

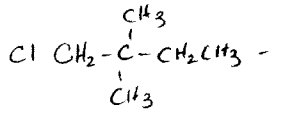
49. $C_{25}H_{52} + 38O_2 \rightarrow 25CO_2 + 26H_2O$

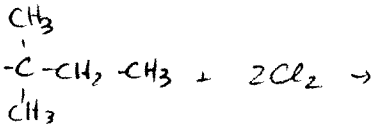
50. Hydrogen > 3°C > 2°C > 1°C >

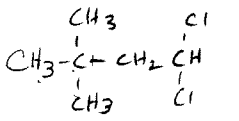
51.  + $Cl_2 \rightarrow$

 - 1-chloro-3,3-dimethylbutane

 - 3-chloro-2,2-dimethylbutane

 - 1-chloro-2,2-dimethyl butane

52.  + $2Cl_2 \rightarrow$

 - 1,1 dichloro-3,3-dimethyl butane

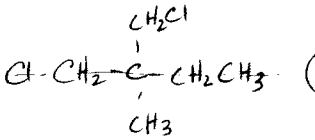
2,2 dichloro-3,3-dimethyl butane

1,2 dichloro-3,3-dimethyl butane

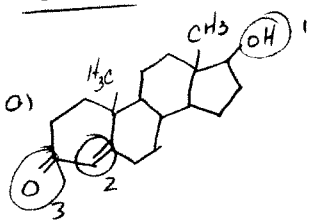
1,4-dichloro-2,2-dimethyl butane

1,3-dichloro-2,2-dimethyl butane

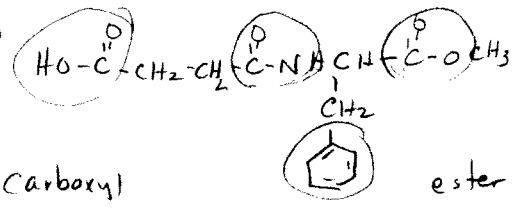
1,1-dichloro-2,2-dimethyl butane

 ??? (1-chloro-2-chloromethyl-2-methyl butane)

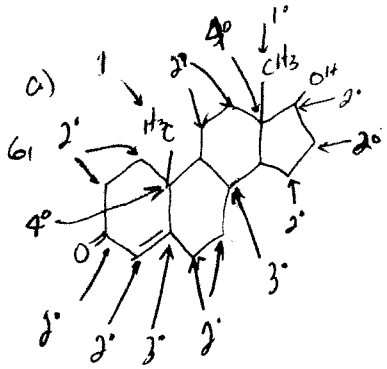
60-71

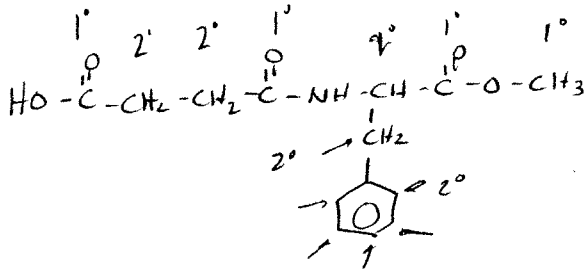
60. a) 

1. hydroxyl
2. alkene / C=C
3. ketone / carbonyl

b) 

carboxyl ester amide arene

61 a) 

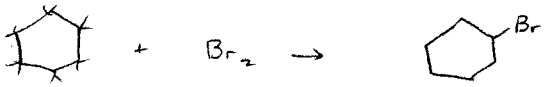
b) 

62. they are isomers of each other. 36°C → pentane
30°C → methyl butane

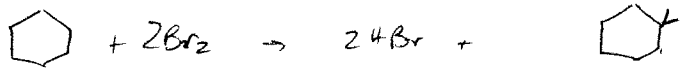
63. Castor oil + Wax are alkanes therefore insoluble in H_2O, but soluble in other non polars (petroleum jelly)

64 $2C_{12}H_{26} + 37O_2 \rightarrow 24CO_2 + 26H_2O$

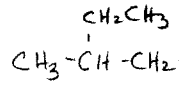
41
26
24

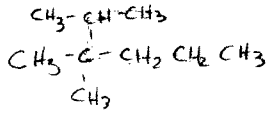
65. 

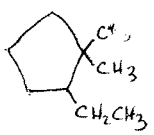
Bromocyclohexane

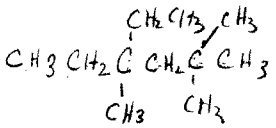


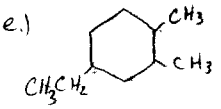
1,1-Dibromocyclohexane
1,2-Dibromocyclohexane
1,3-Dibromocyclohexane
1,4-Dibromocyclohexane - fromMat

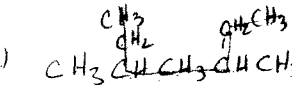
66 a)  3-methyl pentane

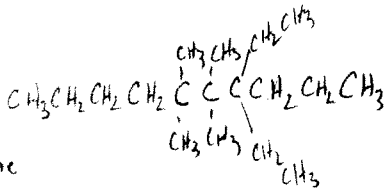
b)  2,3,3-Trimethyl hexane

c  1-ethyl-2,2 dimethyl cyclopentane

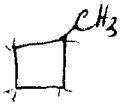
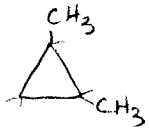
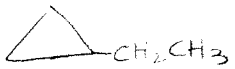
d.  4-ethyl-2,2,4-trimethylhexane

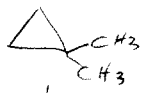
e.)  1-ethyl-3,4-dimethylcyclohexane

f)  3,5-dimethylheptane

g) 

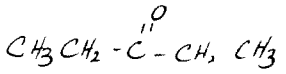
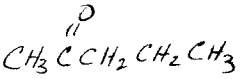
4,4-diethyl-5,5,6,6-tetramethyl decane

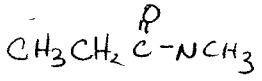
67 C_5H_{10}    

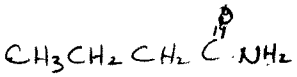
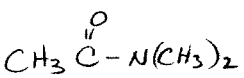
cis, trans 

68. pentane has a higher boiling point than neopentane because there is a greater dispersion force in pentane.

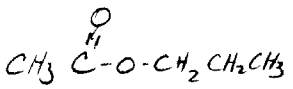
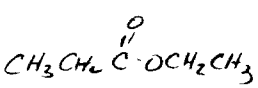
69. a) ketone w/ 5-C

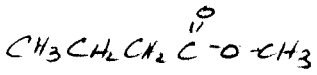
 

b) 

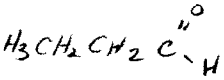
 

c.) 5-carbon ester

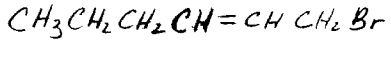
 



d) Aromatic aldehyde 

70. a) 

butanal

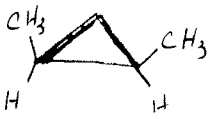
b) 

1-Bromo-2-Hexene

c.) 

d)

2-4-pentadiene

71  

Cis-1,2-dimethyl cyclopropane trans-1,2-dimethylcyclopropane