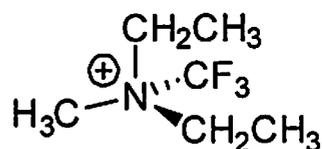


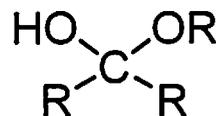
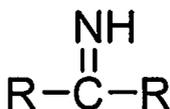
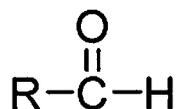
Name: _____

1-10) are True or False (10pts)

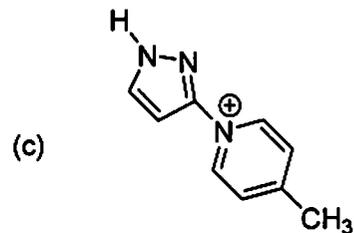
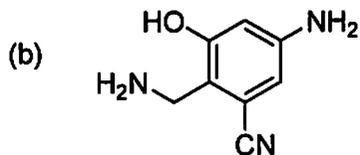
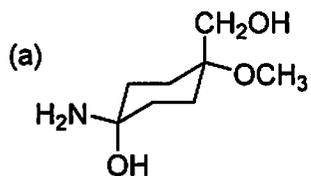
- 1) Aldehydes can undergo nucleophilic addition reactions.
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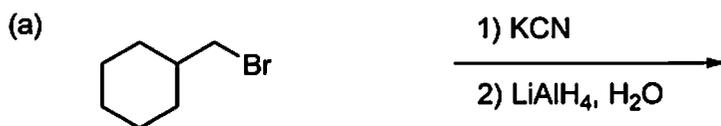
11) (3pts) Name the general class of organic compound (*functional group*) that each of these molecules belong to.



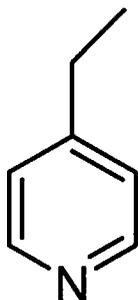
12) Circle the *most basic atom* in each of the following species. (3pts)



13) Give the products formed in these reactions. (10pts)



14) a) Name the following molecule in IUPAC acceptable terms. (2pts)

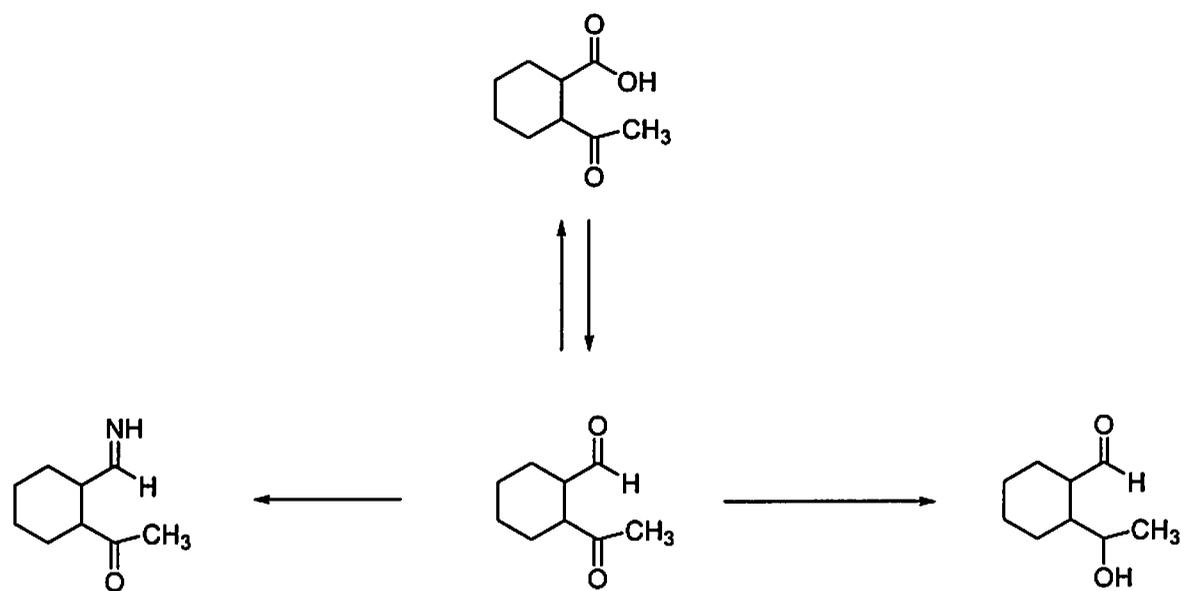


b) Using any format you wish, draw *cis*-3,4-dimethylcyclopentanone. (3pts)

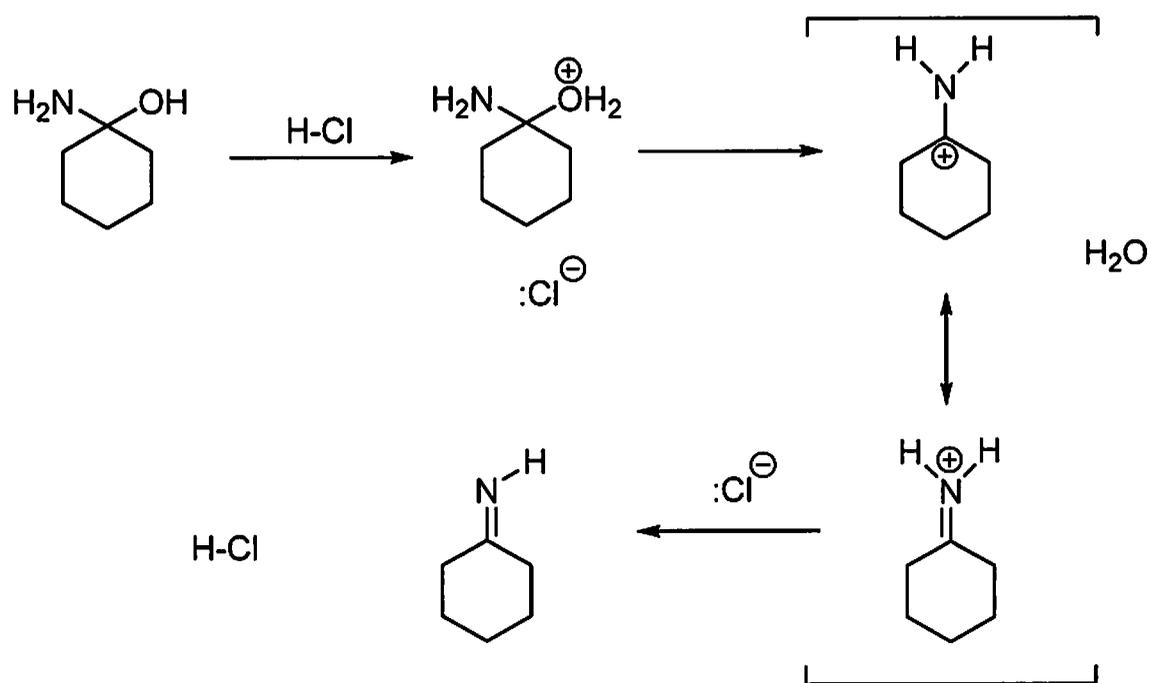
15) (4pts) Write the mechanism (i.e. curly arrows) for the reaction of:



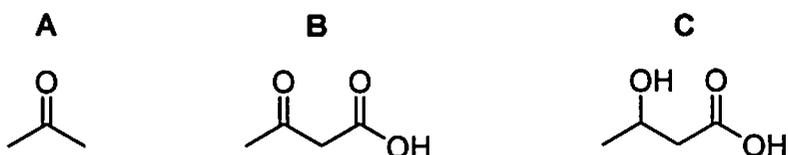
16) Provide sets of reagents for the following **four** transformations (including both the *forward* and *reverse* versions for the vertical transformation). (4x2=8pts)



17) Draw in the curly arrows for the following mechanism. (4pts)



18) (1+1+1=3pts) Recently it has become popular to use *keto*-genic diets, (intermittent) fasting or carbohydrate deprivation to put your body into “Ketosis”, which is a metabolic state in which most of the body's energy supply comes from “ketone bodies” in the blood, in contrast to a state of glycolysis in which blood glucose provides energy. The human liver produces the three “ketone bodies” (A-C) shown below.



a) Despite the name, one of these “ketone bodies” does NOT actually contain a *ketone* functional group. Is that molecule A, B or C?

b) For conversion of B \rightarrow C, is that a *reduction*, *oxidation*, or *neither*?

c) What reagent could you use for conversion of C \rightarrow B?

****Bonus question** (up to 2pts)**

For the three “ketone bodies” in Q18, one is chiral. State which one is chiral.

The human liver produces exclusively the R enantiomer of that molecule, draw this specific enantiomer.

hydrogen 1 H	beryllium 4 Be	lithium 3 Li	boron 5 B	carbon 6 C	nitrogen 7 N	oxygen 8 O	fluorine 9 F	helium 2 He
lithium 3 Li	beryllium 4 Be	beryllium 4 Be	boron 5 B	carbon 6 C	nitrogen 7 N	oxygen 8 O	fluorine 9 F	helium 2 He
sodium 11 Na	magnesium 12 Mg	beryllium 4 Be	boron 5 B	carbon 6 C	nitrogen 7 N	oxygen 8 O	fluorine 9 F	neon 10 Ne
potassium 19 K	calcium 20 Ca	beryllium 4 Be	boron 5 B	carbon 6 C	nitrogen 7 N	oxygen 8 O	fluorine 9 F	argon 18 Ar
rubidium 37 Rb	strontium 38 Sr	beryllium 4 Be	boron 5 B	carbon 6 C	nitrogen 7 N	oxygen 8 O	fluorine 9 F	potassium 39 K
cesium 55 Cs	barium 56 Ba	beryllium 4 Be	boron 5 B	carbon 6 C	nitrogen 7 N	oxygen 8 O	fluorine 9 F	calcium 20 Ca
francium 87 Fr	radium 88 Ra	beryllium 4 Be	boron 5 B	carbon 6 C	nitrogen 7 N	oxygen 8 O	fluorine 9 F	scandium 21 Sc
								titanium 22 Ti
								vanadium 23 V
								chromium 24 Cr
								manganese 25 Mn
								iron 26 Fe
								cobalt 27 Co
								nickel 28 Ni
								copper 29 Cu
								zinc 30 Zn
								gallium 31 Ga
								germanium 32 Ge
								arsenic 33 As
								selenium 34 Se
								bromine 35 Br
								krypton 36 Kr
								rubidium 37 Rb
								strontium 38 Sr
								yttrium 39 Y
								zirconium 40 Zr
								niobium 41 Nb
								molybdenum 42 Mo
								technetium 43 Tc
								ruthenium 44 Ru
								rhodium 45 Rh
								platinum 78 Pt
								gold 79 Au
								mercury 80 Hg
								thallium 81 Tl
								lead 82 Pb
								uranium 92 U
								actinium 89 Ac

* Lanthanide series

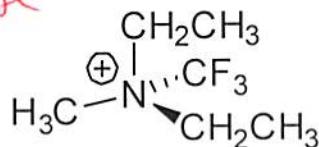
** Actinide series

lanthanum 57 La	cerium 58 Ce	praseodymium 59 Pr	neodymium 60 Nd	promethium 61 Pm	samarium 62 Sm	europium 63 Eu	gadolinium 64 Gd	terbium 65 Tb	dyprosium 66 Dy	holmium 67 Ho	erbium 68 Er	thulium 69 Tm	ytterbium 70 Yb
actinium 89 Ac	thorium 90 Th	protactinium 91 Pa	uranium 92 U	neptunium 93 Np	plutonium 94 Pu	americium 95 Am	curium 96 Cm	berkelium 97 Bk	californium 98 Cf	einsteinium 99 Es	fermium 100 Fm	mendelevium 101 Md	nobelium 102 No

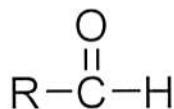
Name: PROTECTING or CONDENSATION?

1-10) are True or False (10pts)

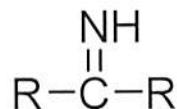
- 1) Aldehydes can undergo nucleophilic addition reactions. T
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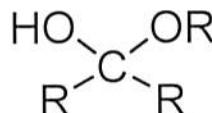
11) (3pts) Name the general class of organic compound (*functional group*) that each of these molecules belong to.



Aldehyde

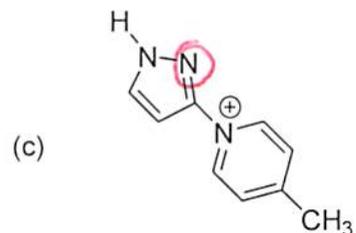
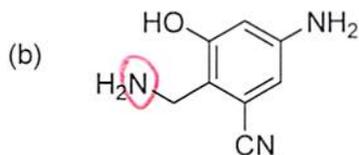
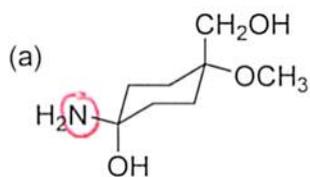


Imine

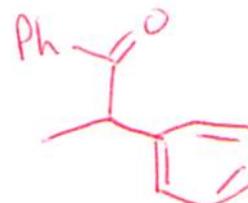
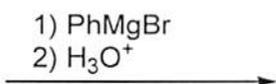
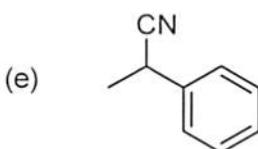
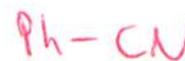
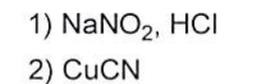
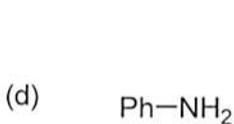
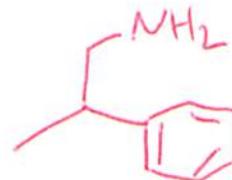
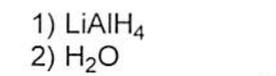
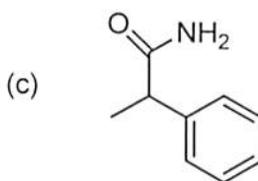
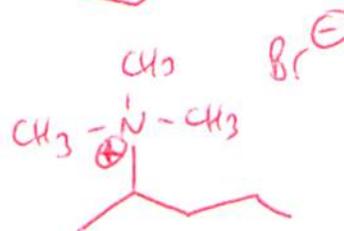
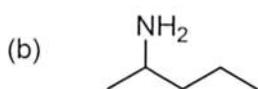
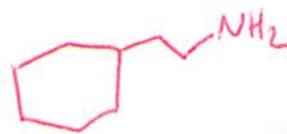
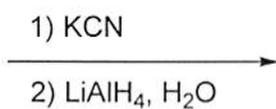
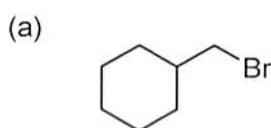


Hemiacetal

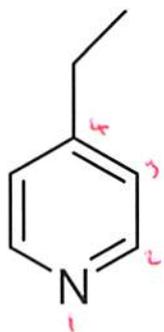
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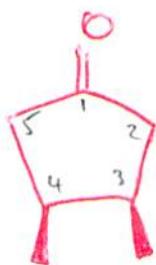


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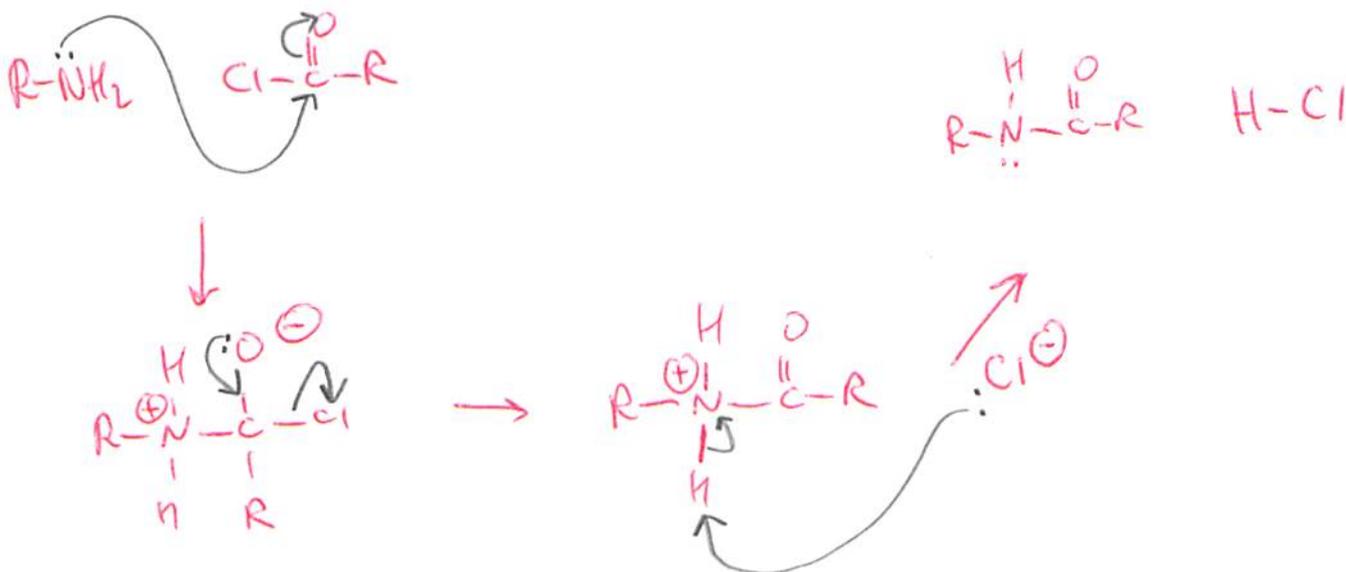


4-Ethylpyridine

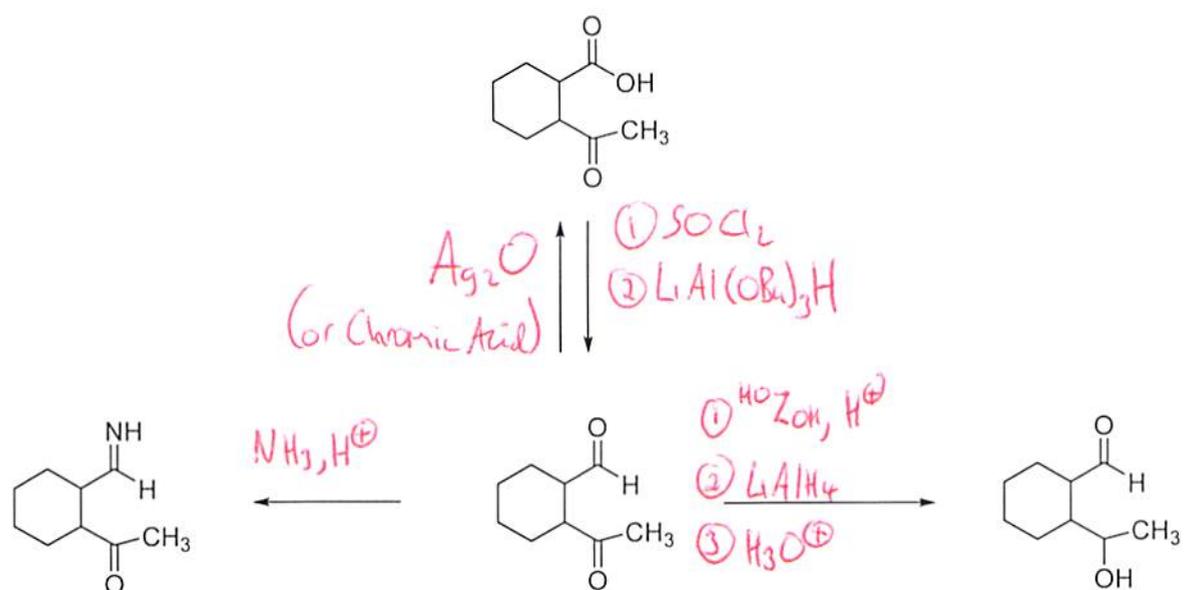
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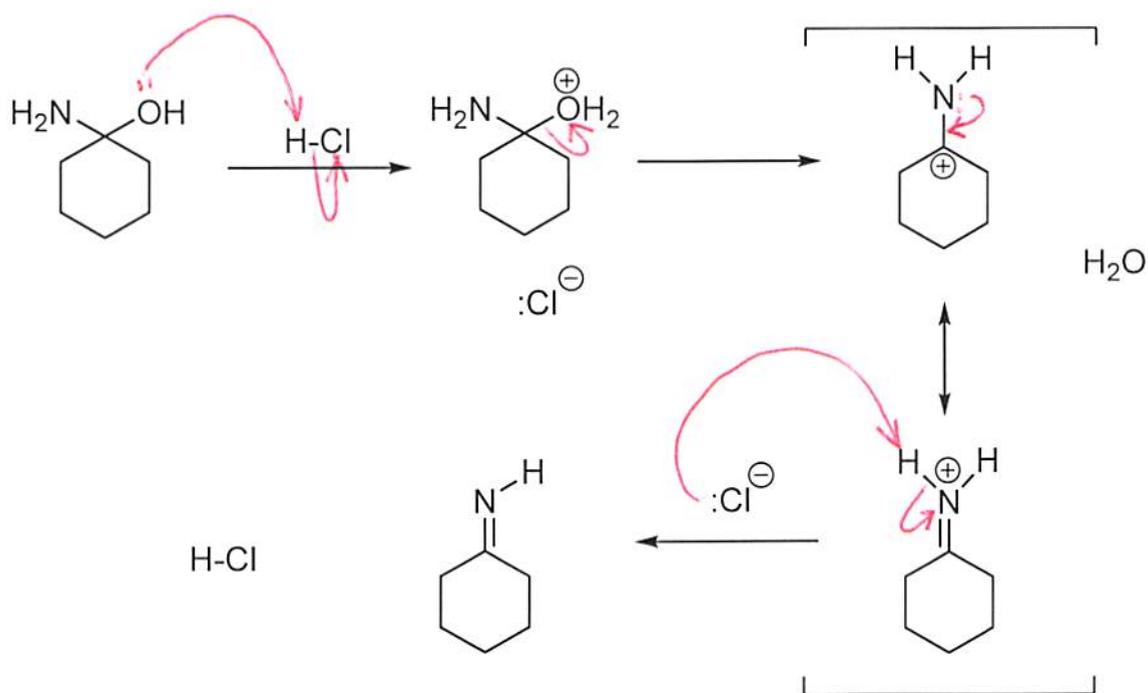
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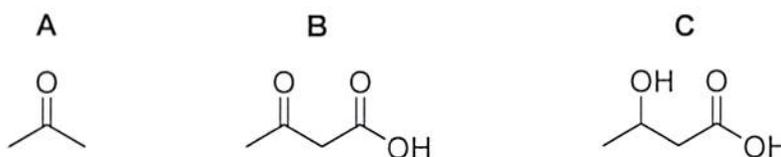
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Chromic Acid

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C

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