Cai-24
Chem3331

Third Exam

Name (PRINT)_____
Last, First

24

01F-E3

Chemistry 3331

Signature _____

November 16, 2001

SS# _____

Please circle the name of your professor and class time where appropriate.

Dr. Bean (T/Th 10 AM) **Dr. Cai**

Dr. Bean (T/Th 5:30 PM)

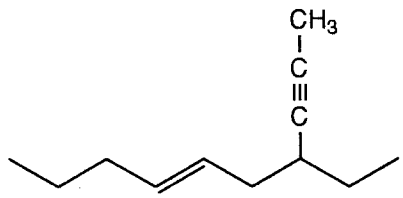
Page #	Score	
1. 12 pts.		
2. 7 pts.		
3. 19 pts.		
4. 21 pts.		
5. 21 pts.		
6. 10 pts.		
7. 10 pts.		

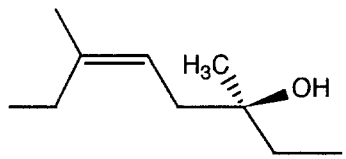
TOTAL_____

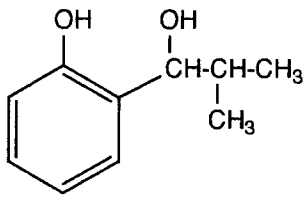
Note: Present your student ID when you return the exam booklet

I. NOMENCLATURE: (12 points, 4 pts. each)

Give an acceptable IUPAC name for each of the following compounds. Be sure to indicate the **stereochemistry** where appropriate.

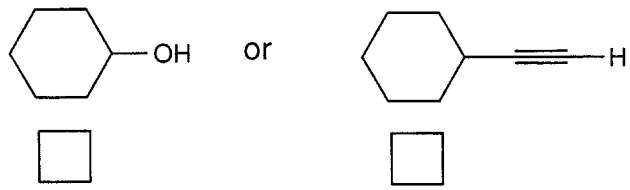
1. 

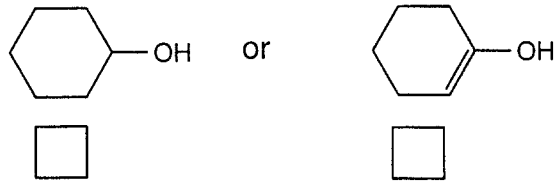
2. 

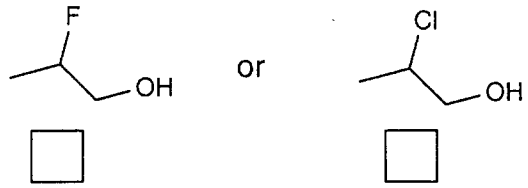
3. 

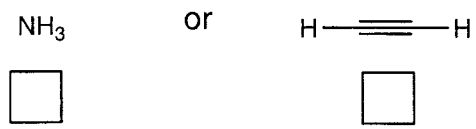
B. FACTS (26 pts)

1) For each of the following pairs of compounds, place an **X** in the box below the **more** acidic compounds. (4 pts)

a) 

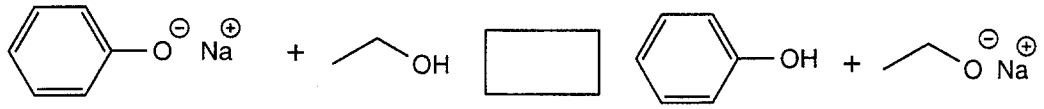
b) 

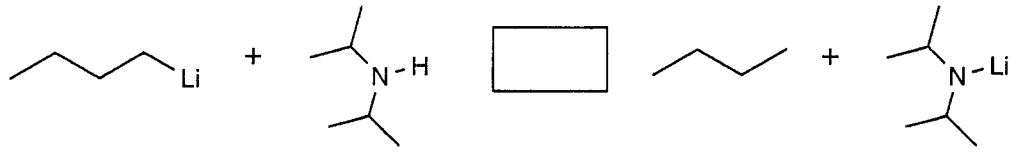
c) 

d) 

2) For each of the following reactions, place an arrow in the box to indicate the direction of the reaction (reactants → products). (3 pts.)

a) 

b) 

c) 

3) From the list of reagents in the box on the left side of the page select the best answer to each of the following questions and place the letter(s) of the reagent(s) in the box(es) provided for the answer(s). If none of the reagents in the list carry out the transformation, place an X in the answer box. (1 point for each box)

A H_3O^+

B $HgSO_4/H_2O/H_2SO_4$

C $Hg(OAc)_2/H_2O$

D $NaBH_4$ / EtOH

E BH_3/THF

F $(Sia)_2BH$/THF

G O_3

H $(CH_3)_2S$

I MCPBA (a peroxyacid)

J $CH_2I_2/Zn/Cu$

K Mg/ether

L $H_2/Pd/BaSO_4$/quinoline

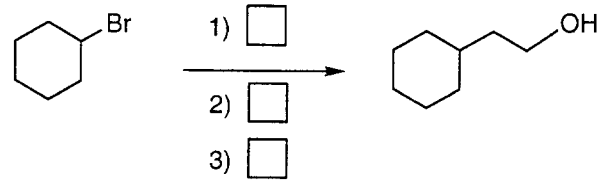
M 

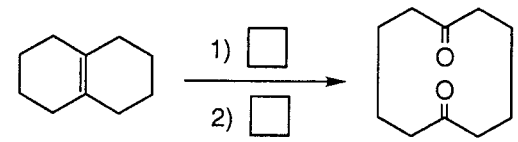
N Br_2/H_2O

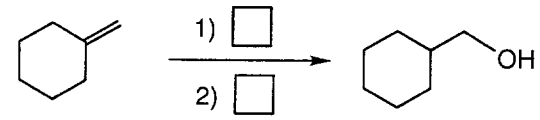
O Na/NH_3

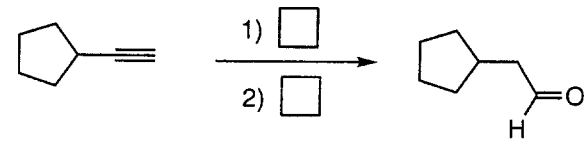
P $H_2O_2/NaOH$

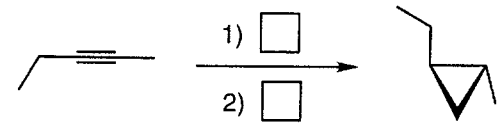
X None available

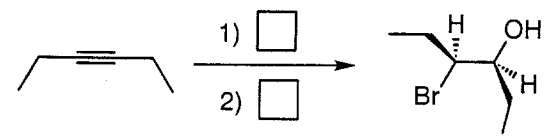
a) 

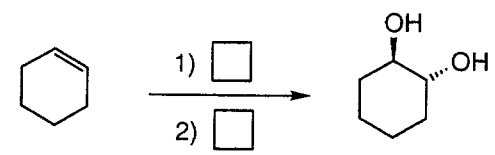
b) 

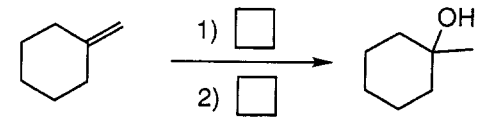
c) 

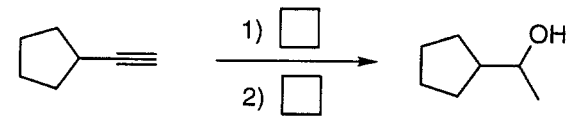
d) 

e) 

f) 

g) 

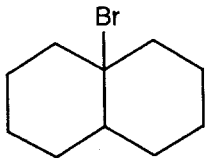
h) 

i) 

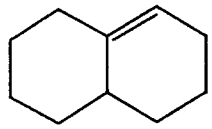
□

III. REACTIONS: (42 points, 7 pts. each)

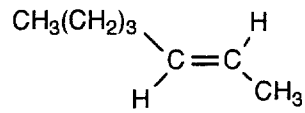
Please give the final **major** product, the starting material, or the reactants for each of the following reactions in the box provided. Be sure your answers indicate **stereochemistry** where appropriate. Intermediate products may be placed below the reaction for partial credit but not in the answer box.

1. 

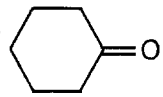
$\xrightarrow[3.\ H_2O_2\ /\ OH^-]{1.\ (CH_3)_3CO^-\ K^+\ \ 2.\ BH_3\bullet THF}$

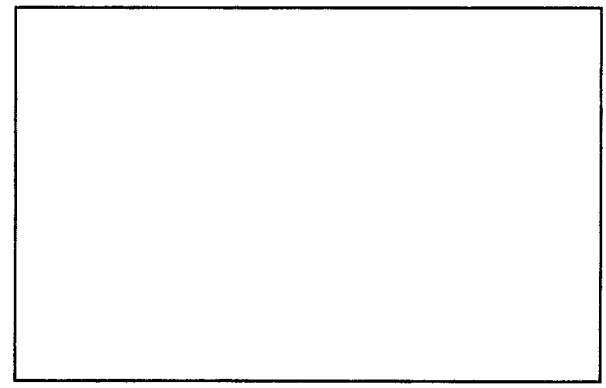
2. 

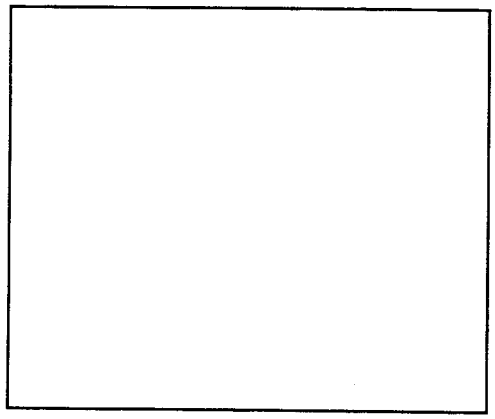
$\xrightarrow[2.\ NaBH_4\ /\ EtOH]{1.\ KMnO_4\ (warm,\ conc.)\ /\ H^+}$

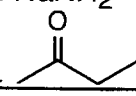
3. $CH_3CH_2CH{=}CH_2$ $\longrightarrow$ 

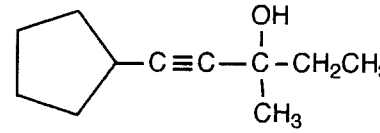
4. $CH_3-C\equiv C-H$

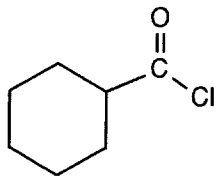
1. HCl (1 eq.)
2. Mg / ether
3. 
4. H_3O^+ (or H_2O)



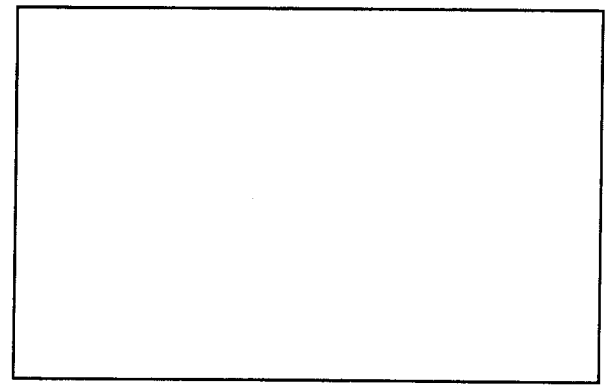
5. 

1. $NaNH_2$
2. 
3. H_3O^+ (or H_2O)



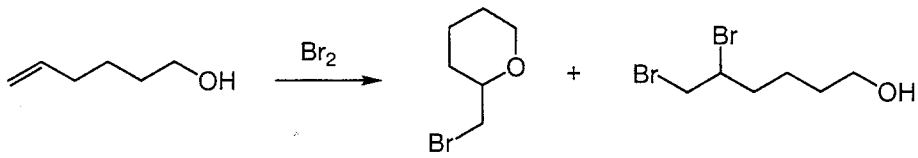
6. 

1. CH_3CH_2Br (2 eq.) / ether
2. H_2SO_4 / heat



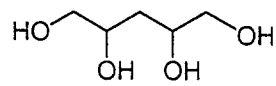
D. Mechanism. (10 pts.)

Provide a clear mechansm for the following reaction. Use curved arrow notation to indicate **every** "electron flow", and show **all** intermediates and formal charges.



E. Synthesis. (10 pts.)

From propane, ethyne, and any inorganic reagents, synthesize the compound below.



FISHER SCIENTIFIC / PERIODIC CHART OF THE ELEMENTS

IA	IIA	IIIB	IVB	VB	VIB	VIIB	VIII			IB	IIB	IIIA	IVA	VA	VIA	VIIA	NOBLE GASES	
																1 H 1.0079†	2 He 4.00260	2
3 Li 6.941†	4 Be 9.01218											5 B 10.81	6 C 12.011	7 N 14.0067	8 O 15.9994†	9 F 18.99840	10 Ne 20.179†	2 8
11 Na 22.98977	12 Mg 24.305											13 Al 26.98154	14 Si 28.086†	15 P 30.97376	16 S 32.06	17 Cl 35.453	18 Ar 39.948†	2 8 8
19 K 39.098†	20 Ca 40.08	21 Sc 44.9559	22 Ti 47.90†	23 V 50.9414†	24 Cr 51.996	25 Mn 54.9380	26 Fe 55.847†	27 Co 58.9332	28 Ni 58.71†	29 Cu 63.546†	30 Zn 65.38	31 Ga 69.72	32 Ge 72.59†	33 As 74.9216	34 Se 78.96†	35 Br 79.904	36 Kr 83.80	2 8 18 8
37 Rb 85.4678†	38 Sr 87.62	39 Y 88.9059	40 Zr 91.22	41 Nb 92.9064	42 Mo 95.94†	43 Tc 98.9062	44 Ru 101.07†	45 Rh 102.9055	46 Pd 106.4	47 Ag 107.868	48 Cd 112.40	49 In 114.82	50 Sn 118.69†	51 Sb 121.75†	52 Te 127.60†	53 I 126.9045	54 Xe 131.30	2 8 18 18 8
55 Cs 132.9054	56 Ba 137.34†	57 *La 138.9055†	72 Hf 178.49†	73 Ta 180.9479†	74 W 183.85†	75 Re 186.2	76 Os 190.2	77 Ir 192.22†	78 Pt 195.09†	79 Au 196.9665	80 Hg 200.59†	81 Tl 204.37†	82 Pb 207.2	83 Bi 208.9804	84 Po (210)-	85 At (210)	86 Rn (222)-	2 8 18 32 18 8
87 Fr (223)	88 Ra 226.0254	89 †Ac (227)	104 § (260)	105 § (260)														

* Lanthanoid Series														
58 Ce 140.12	59 Pr 140.9077	60 Nd 144.24†	61 Pm (147)	62 Sm 150.4	63 Eu 151.96	64 Gd 157.25†	65 Tb 158.9254	66 Dy 162.50†	67 Ho 164.9304	68 Er 167.26†	69 Tm 168.9342	70 Yb 173.04†	71 Lu 174.97	2 8 18 32 9 2

† Actinoid Series														
90 Th 232.0381	91 Pa 231.0359	92 U 238.029	93 Np 237.0482	94 Pu (244)	95 Am (243)	96 Cm (247)	97 Bk (247)	98 Cf (251)	99 Es (254)	100 Fm (257)	101 Md (258)	102 No (255)	103 Lr (256)	2 8 18 32 32 9 2

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§ The International Union for Pure and Applied Chemistry has not adopted official names or symbols for these elements.

† These weights are considered reliable to ±3 in the last place. Other weights are reliable to ±1 in the last place.

Atomic weights corrected to conform to the 1971 values of the Commission on Atomic Weights

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