SCH4U TEST – Unit 4: Organic Chemistry
Pierre Elliott Trudeau High School

TEACHER: Mr Cheung **NAME:** Uni Lee

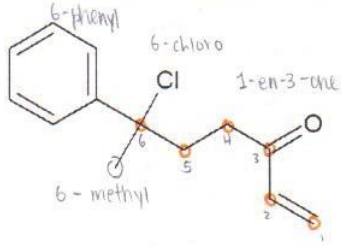
TIME ALLOTED: 75 minutes **DATE:** Jan 7 2015

K/U: 6/12	COM: 9/10	T/I: 12/15	APPL: 8/12

Communication - *Answer the following questions in the spaces provided.* **(10 marks)**

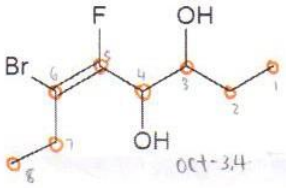
13. Provide the IUPAC name for each of the following compounds: **(8 marks)**

a)



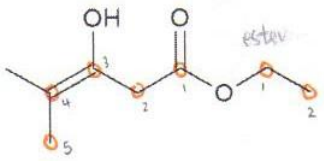
6-chloro-6-methyl-6-phenylhex-1-en-3-one

b)



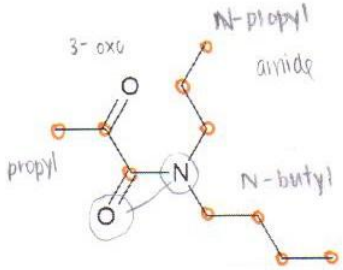
cis-6-bromo-5-fluoroct-5-en-3,4-diol

c)



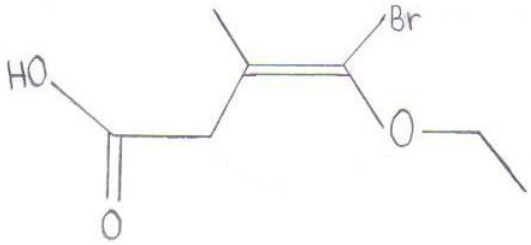
ethyl 3-hydroxy-4-methylpent-3-enoate

d)



N-butyl-N-propyl-3-oxopropylamide

14. Draw the line diagram for cis-4-bromo-5-ethoxy-3-methylpent-3-enoic acid **(2 marks)**



-1

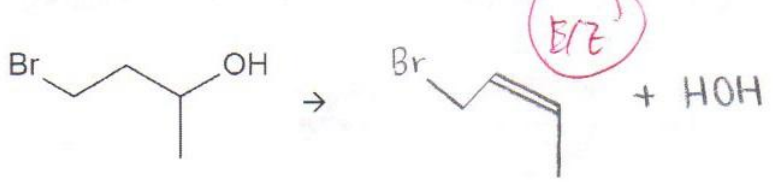
Thinking / Inquiry - *Answer the following questions in the spaces provided.* **(15 marks)**

15. For each of the following:
- ✓ Draw line structural diagrams for **ALL** reactants and products (indicate major/minor products and the reaction conditions where necessary)
- ✓ You **DO NOT** have to name the reactants or products
- ✓ Identify the type of reaction.

a) 1-fluoropropan-1-ol reacts with but-3-ynoic acid.

TYPE OF REACTION: Esterification ✓

b) 4-bromobutan-2-ol is heated to 180°C in the presence of sulphuric acid.



E/Z

+1/-?

+1.5

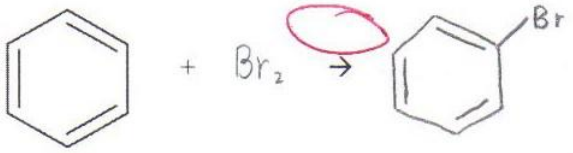
TYPE OF REACTION: condensation

c) 2-bromobutan-1-amine reacts with chloroethane.

+1

TYPE OF REACTION: Addition

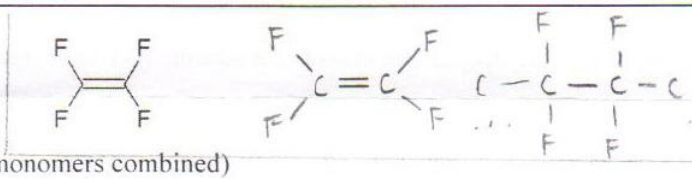
d) Benzene reacts with 1 molecule of bromine gas.



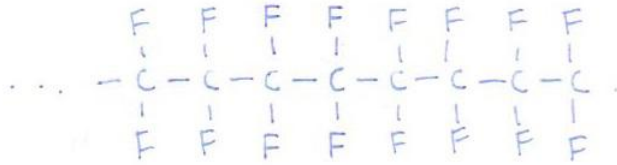
-0,5

TYPE OF REACTION: substitution ✓

e) Molecules of tetrafluoroethene polymerize.



(Your answer must show a minimum of four monomers combined)

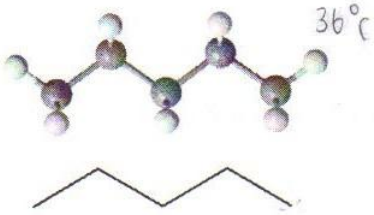


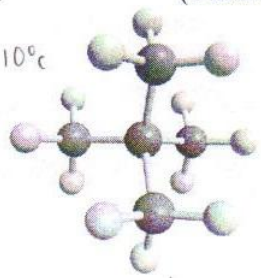
TYPE OF POLYMERIZATION: Addition ✓

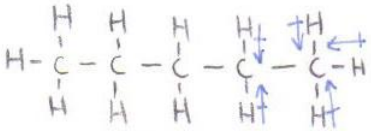
-3//

Application - *Answer the following questions in the spaces provided.* **(12 marks)**

16. The boiling point for pentane (36°C) is higher than that of dimethylpropane (10°C). **(4 marks)**
Using the diagrams shown below, suggest a reason for this.







ΔEN H-C 0,4

ΔEN H-H/C-C 0.0

pentane is more polar.
carbons hold onto 2 or 3 H.
but the carbon in dimethylpropane holds onto 4 carbon and ΔEN is zero.

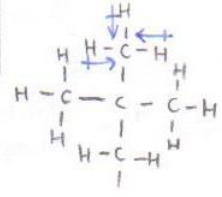
LDF?

dipoles point to middle carbons

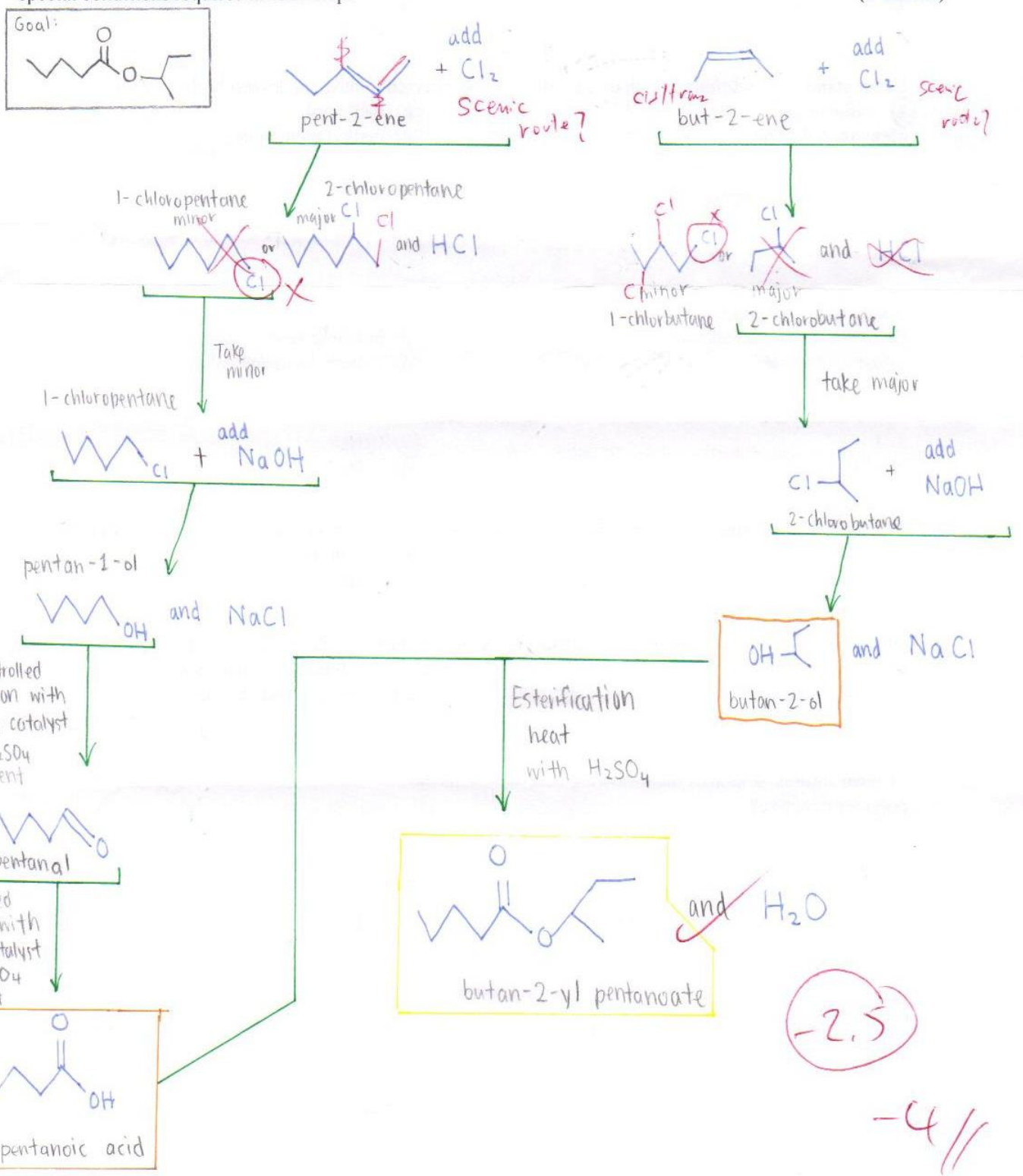
S.O. SA.?

-1.5

so boiling point is higher, held together stronger



17. Suggest a synthesis pathway for butan-2-yl pentanoate from alkenes.
Be sure to properly draw / name / identify the line structures for all major / minor products and indicate any special conditions required at each step. **(8 marks)**



Knowledge/Understanding – *Multiple Choice. Choose the most appropriate answer and shade its corresponding letter onto the Scantron sheet provided.* **(12 marks)**

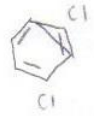
1. Which of the following would be an isomer of cyclopropane?

a) propane
b) propyne
c) propene
d) cyclopropene

2. Which of the following is expected to have the highest boiling point under standard conditions?

a) hexane
b) pentane
c) 2,2-dimethylpropane
d) 2-methylbutane

3. How many structural isomers does dichlorobromobenzene have?



a) four
b) five
c) six
d) seven

4. Which organic compound is unsaturated?

a) ethylcyclopentane
b) 2-methyl-3-ethylpent-1-yne
c) 1,1-dimethylhexane
d) cyclohexane
e) None of the above

5. How many double bonds does a benzene ring possess?

a) 3
b) 2
c) 1
d) 0

6. Under standard conditions, which of the following is expected to have the lowest boiling point?

a) methane
b) methanol
c) methanoic acid
d) methyl methanoate

7. What is the general formula for an alkyne?

a) C_nH_n
b) C_nH_{2n}
c) C_nH_{2n+2}
d) C_nH_{2n-2}

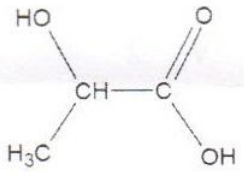
8. A student adds water to 2–methylpropene in an acidic medium. The most likely product to be formed is:
   a) prop-1-ene and methanol
   b) butanoic acid
   c) 2-methylpropan-1-ol
   d) 2-methylpropan-2-ol

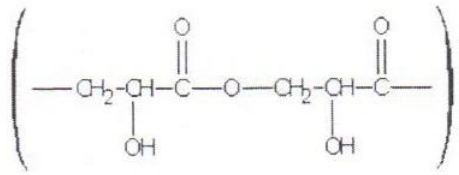
9. Which compound will react most rapidly with liquid bromine?
   a) CH_4
   b) C_6H_6
   c) C_2H_4
   d) C_2H_6

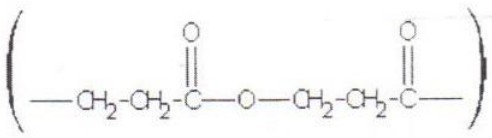
10. Which of the following compounds is expected to be the least soluble in water at room temperature?
   a) propan-1-ol
   b) propanoic acid
   c) propanone
   d) propene

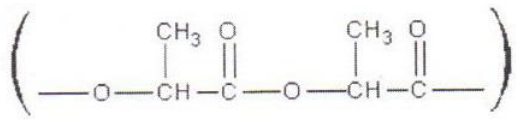
11. Of the four names listed below, 3 contain errors. Which is the only one that is correct?
   a) 2-pentanal
   b) 1,2-dimethylpropanoate
   c) 2,3-dichloropentane
   d) 3-methylpropanoic acid

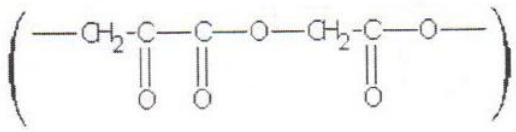
12. The polymer formed from lactic acid (shown on the right) is used for surgical sutures. Which of the following best represents the polymer structure?



a) 

b) 

c) 

d) 

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- MAKE DARK MARKS
- ERASE COMPLETELY TO CHANGE
- EXAMPLE: A B D E

TO USE SUBJECTIVE SCORE FEATURE:

- Mark total possible subjective points
- Only one mark per line on key
- 163 points maximum

EXAMPLE OF STUDENT SCORE:

SUBJECTIVE SCORE INSTRUCTOR USE ONLY

100	90	80	70	60
50	40	30	20	10
9	8	7	6	5
4	3	2	1	0

PART 1

	(T)	(F)		KEY
	%	2	3	5
1	A	B	●	D E
2	●	B	C	D E
3	A	●	C	D E
4	A	B	C	● E
5	●	B	C	D E
6	●	B	C	D E
7	A	B	C	● E
8	A	B	●	D E
9	A	●	C	D E
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11	A	B	●	D E
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25	A	B	C	D E

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