
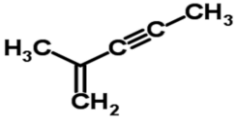
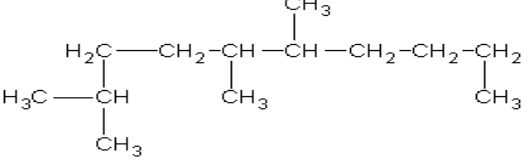
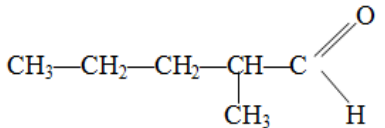
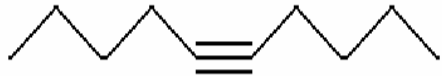
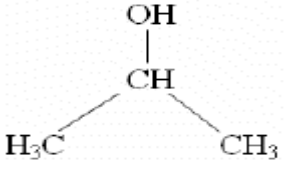
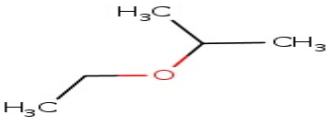
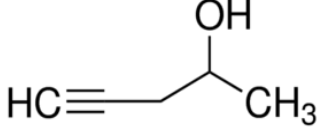


SCH4U Unit 2 - Practice Questions B [Answer Key]

1. Match the organic compound class name to the structural formula below. [A, 6: 0.5 each]

i  K	ii $\text{H}_3\text{C}-\text{CH}_2-\overset{\text{O}}{\parallel}{\text{C}}-\text{CH}_3$ G
iii  C	iv $\text{H}_3\text{C}-\text{CH}_2-\text{CH}_2-\text{CH}_2-\text{CH}_2-\text{CH}_3$ F
v  E	vi  J
vii  L	viii  D
ix  I	x  A
xi $\text{CH}_3-\overset{\text{O}}{\parallel}{\text{C}}-\text{O}-\text{CH}_3-\text{CH}_2-\text{CH}_3$ B	xii $\text{CH}_3-\text{CH}_2-\text{CH}_2-\text{CH}_2-\overset{\text{O}}{\parallel}{\text{C}}-\text{OH}$ H

A) 4-pentyn-2-ol

B) propyl ethanoate

C) 2-methyl-1-penten-3-yne

D) Propan-2-ol

E) 2, 5, 6-trimethyl decane

F) hexane

G) butanone

H) 1-pentanoic acid

I) ethoxy propane

J) 2-methylpentanal

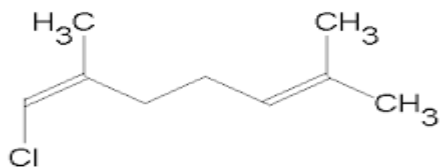
K) 1,3-cyclopentadiene

L) dec-5-yne

2. Name the following compounds.

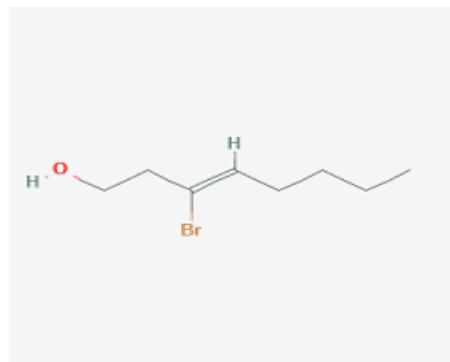
[A, 8; 2 each]

(a)



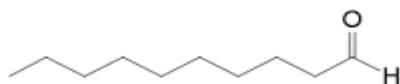
1-chloro-2,6-dimethyl-1,5-heptadiene

(b)



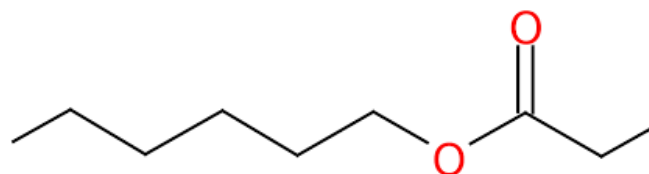
3-bromo-3-octene-1-ol

(c)



decanal

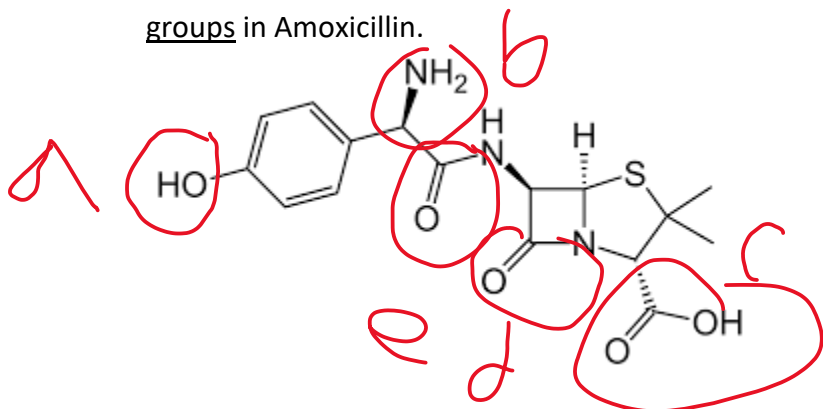
(d)



hexyl propanoate

3. The structure below is an antibiotic called Amoxicillin. Circle and name 2 different functional groups in Amoxicillin.

[A, 2; 1 each]



a= hydroxyl, b=amino, c=carboxyl, d=ketone, e=ketone

SECTION 2: Drawing

4. Complete the following table.

a) Draw two alcohols with the molecular formula $C_5H_{12}O$.

[T/I, 4: 2 each]

b) State the name of the alcohol.

[A, 2: 1 each]

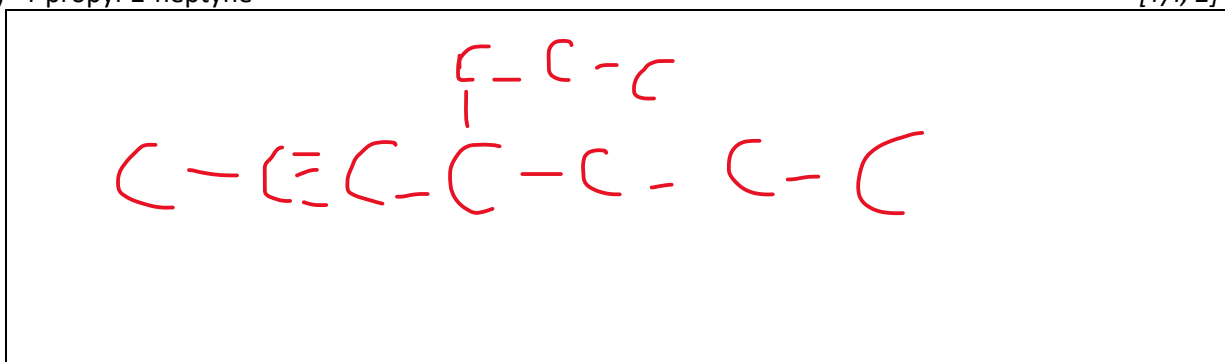
Name of Alcohol	1-pentanol, 3-methyl-1-butanol	2-methyl-1-butanol, 2,2-dimethyl-1-propanol
Structural Formula		

5. Draw the structural formula for the following organic compounds:

[T/I, 8: 2 each]

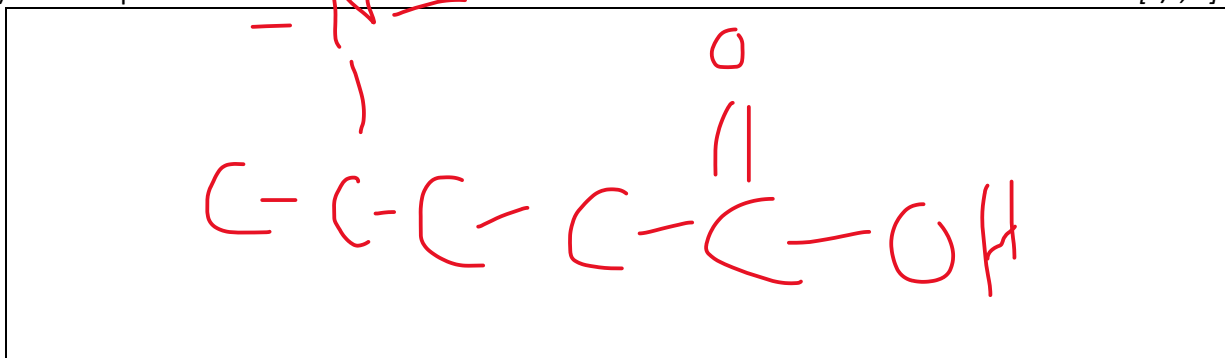
(a) 4-propyl-2-heptyne

[T/I, 2]



(b) 4-aminopentanoic acid

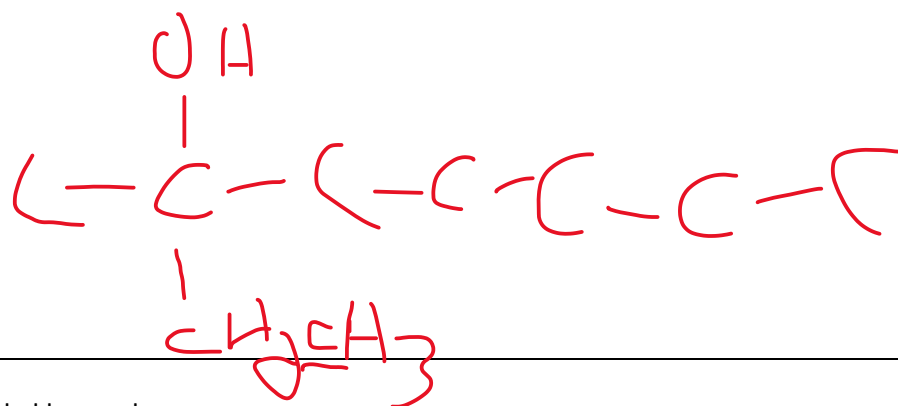
[T/I, 2]





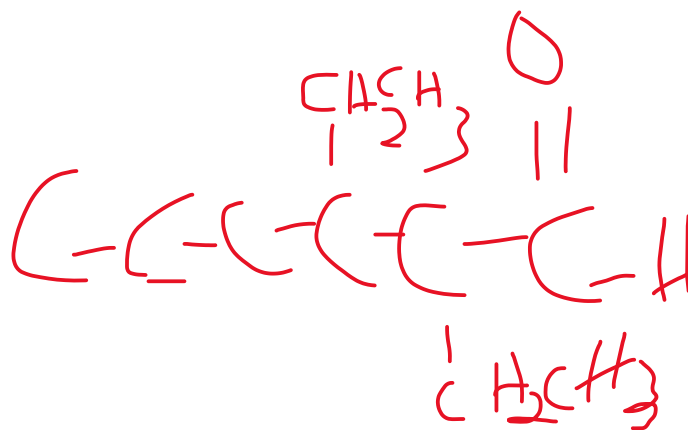
(c) 2-ethyl-2-hexanol

[T/I, 2]



(d) 2,3-diethyl hexanal

[T/I, 2]





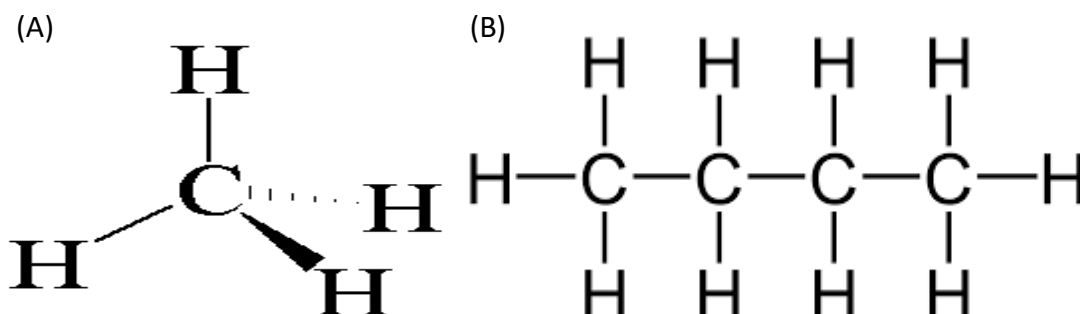
SECTION 3: Communication – Long Answer (Questions 17 - 18)

The following questions will be graded according to the following rubric:

Criteria	Level 4	Level 3	Level 2	Level 1
APPLICATION Making connections between science, technology, society, and environment	makes connections between science, technology, society, and the environment with a high degree of effectiveness (3 marks)	makes connections between science, technology, society, and the environment with considerable effectiveness (2 marks)	makes connections between science, technology, society, and the environment with some effectiveness (1 mark)	makes connections between science, technology, society, and the environment with limited effectiveness (0 - 0.5 mark)
COMMUNICATION Information and ideas are communicated with complete and correct answers	Information and ideas are communicated clearly and precisely (2 mark)	Information and ideas are communicated with considerable clarity and precision (0.1 marks)	Information and ideas are communicated with some clarity and precision (0.5 marks)	Information and ideas are communicated limited clarity and precision (0 marks)

6. Butane is commonly found in lighters, while methane is a greenhouse gas that is locked in permafrost.

[A, 3; C, 2]



Identify which structural formula is methane and butane. How are they related structurally? Which one would you think is used in lighters? Which one do you think is a gas? Give reasons for your answer.

The first molecule is methane and the second one is butane. Butane would be used in lighters because it has a longer hydrocarbon chain which increases the number of London dispersion forces, enough so that the substance is a liquid. Methane would be a gas because there are not as many London dispersion forces attracting it to itself. Also, butane has more bonds to break when it is combusted so more energy will be released.



7. Explain which compound in each of the following pair will have the higher **boiling point**.

[A, 3; C, 2]

pentane or heptanol.

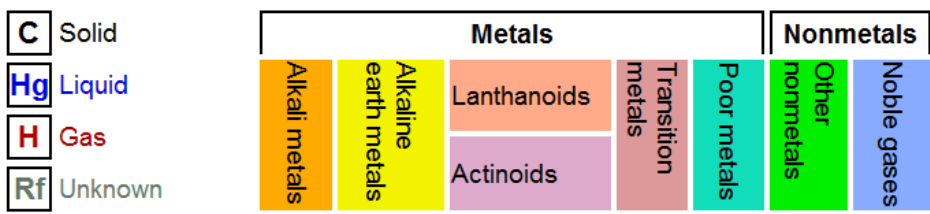
Heptanol will have the higher boiling point. When boiling, the intermolecular bonds between molecules are broken. The stronger the bonds, the higher the boiling point. Heptanol has a higher boiling point than pentane because:

- It has a longer hydrocarbon chain so more London dispersion forces can exist between molecules
- It has a hydroxyl group that allows it to hydrogen bond to itself. Hydrogen bonds are much stronger than LDF

**REFERENCE RESOURCES:****Names of the first 10 alkanes**

# of Carbon atoms	Name	Molecular Formula
1	methane	CH ₄
2	ethane	C ₂ H ₆
3	propane	C ₃ H ₈
4	butane	C ₄ H ₁₀
5	pentane	C ₅ H ₁₂
6	hexane	C ₆ H ₁₄
7	heptane	C ₇ H ₁₆
8	octane	C ₈ H ₁₈
9	nonane	C ₉ H ₂₀
10	decane	C ₁₀ H ₂₂

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18																																																											
1 H Hydrogen 1.00794	3 Li Lithium 6.941	4 Be Beryllium 9.012182	11 Na Sodium 22.98976928	12 Mg Magnesium 24.3050	19 K Potassium 39.0983	20 Ca Calcium 40.078	21 Sc Scandium 44.955912	22 Ti Titanium 47.887	23 V Vanadium 50.9415	24 Cr Chromium 51.9961	25 Mn Manganese 54.938045	26 Fe Iron 55.845	27 Co Cobalt 58.933195	28 Ni Nickel 58.6934	29 Cu Copper 63.546	30 Zn Zinc 65.38	31 Ga Gallium 69.723	32 Ge Germanium 72.64	33 As Arsenic 74.92160	34 Se Selenium 78.96	35 Br Bromine 79.904	36 Kr Krypton 83.798	37 Rb Rubidium 85.4678	38 Sr Strontium 87.62	39 Y Yttrium 88.90585	40 Zr Zirconium 91.224	41 Nb Niobium 92.90638	42 Mo Molybdenum 95.96	43 Tc Technetium (97.9072)	44 Ru Ruthenium 101.07	45 Rh Rhodium 102.90550	46 Pd Palladium 106.42	47 Ag Silver 107.8682	48 Cd Cadmium 112.411	49 In Indium 114.818	50 Sn Tin 118.710	51 Sb Antimony 121.760	52 Te Tellurium 127.60	53 I Iodine 126.90447	54 Xe Xenon 131.293	55 Cs Caesium 132.9054519	56 Ba Barium 137.327	57-71	72 Hf Hafnium 178.49	73 Ta Tantalum 180.94788	74 W Tungsten 183.84	75 Re Rhenium 186.207	76 Os Osmium 190.23	77 Ir Iridium 192.217	78 Pt Platinum 195.084	79 Au Gold 196.966569	80 Hg Mercury 200.59	81 Tl Thallium 204.3833	82 Pb Lead 207.2	83 Bi Bismuth 208.98040	84 Po Polonium (208.9824)	85 At Astatine (208.9871)	86 Rn Radon (222.0176)	87 Fr Francium (223)	88 Ra Radium (226)	89-103	104 Rf Rutherfordium (261)	105 Db Dubnium (262)	106 Sg Seaborgium (266)	107 Bh Bohrium (264)	108 Hs Hassium (277)	109 Mt Meitnerium (268)	110 Ds Darmstadtium (271)	111 Rg Roentgenium (272)	112 Uub Ununbium (285)	113 Uut Ununtrium (284)	114 Uuq Ununquadium (289)	115 Uup Ununpentium (288)	116 Uuh Ununhexium (292)	117 Uus Ununseptium	118 Uuo Ununoctium (294)



For elements with no stable isotopes, the mass number of the isotope with the longest half-life is in parentheses.

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57 La Lanthanum 138.90547	58 Ce Cerium 140.116	59 Pr Praseodymium 140.90765	60 Nd Neodymium 144.242	61 Pm Promethium (145)	62 Sm Samarium 150.36	63 Eu Europium 151.964	64 Gd Gadolinium 157.25	65 Tb Terbium 158.92535	66 Dy Dysprosium 162.500	67 Ho Holmium 164.93032	68 Er Erbium 167.259	69 Tm Thulium 168.93421	70 Yb Ytterbium 173.054	71 Lu Lutetium 174.9688
89 Ac Actinium (227)	90 Th Thorium 232.03806	91 Pa Protactinium 231.03688	92 U Uranium 238.02891	93 Np Neptunium (237)	94 Pu Plutonium (244)	95 Am Americium (243)	96 Cm Curium (247)	97 Bk Berkelium (247)	98 Cf Californium (251)	99 Es Einsteinium (252)	100 Fm Fermium (257)	101 Md Mendelevium (258)	102 No Nobelium (259)	103 Lr Lawrencium (262)