
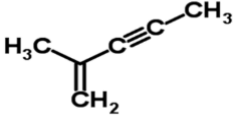
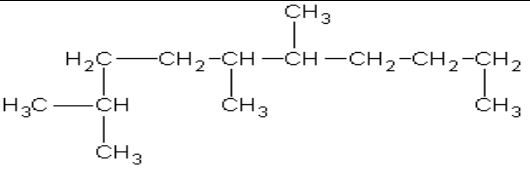
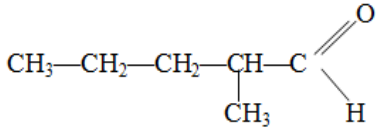

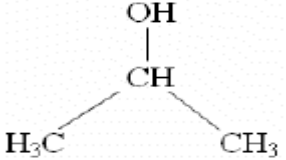
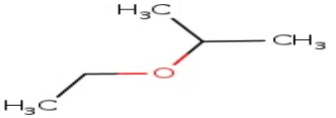
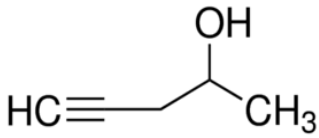


SCH4U Unit 2 - Practice Questions B [Answer Key]

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

<p>i</p>  <p style="text-align: right;">K</p> <p>_____</p>	<p>ii</p> $\text{H}_3\text{C}-\text{CH}_2-\overset{\text{O}}{\parallel}{\text{C}}-\text{CH}_3$ <p style="text-align: right;">G</p> <p>_____</p>
<p>iii</p>  <p style="text-align: right;">C</p> <p>_____</p>	<p>iv</p> $\text{H}_3\text{C}-\text{CH}_2-\text{CH}_2-\text{CH}_2-\text{CH}_2-\text{CH}_3$ <p style="text-align: right;">F</p> <p>_____</p>
<p>v</p>  <p style="text-align: right;">E</p> <p>_____</p>	<p>vi</p>  <p style="text-align: right;">J</p> <p>_____</p>
<p>vii</p>  <p style="text-align: right;">L</p> <p>_____</p>	<p>viii</p>  <p style="text-align: right;">D</p> <p>_____</p>
<p>ix</p>  <p style="text-align: right;">I</p> <p>_____</p>	<p>x</p>  <p style="text-align: right;">A</p> <p>_____</p>
<p>xi</p> $\text{CH}_3 - \overset{\text{O}}{\parallel}{\text{C}} - \text{O} - \text{CH}_3 - \text{CH}_2 - \text{CH}_3$ <p style="text-align: right;">B</p> <p>_____</p>	<p>xii</p> $\text{CH}_3 - \text{CH}_2 - \text{CH}_2 - \text{CH}_2 - \overset{\text{O}}{\parallel}{\text{C}} - \text{OH}$ <p style="text-align: right;">H</p> <p>_____</p>

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

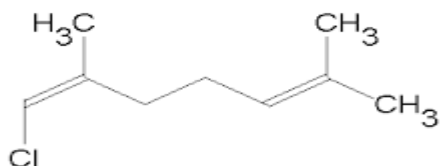
K) 1,3-cyclopentadiene

L) dec-5-yne

2. Name the following compounds.

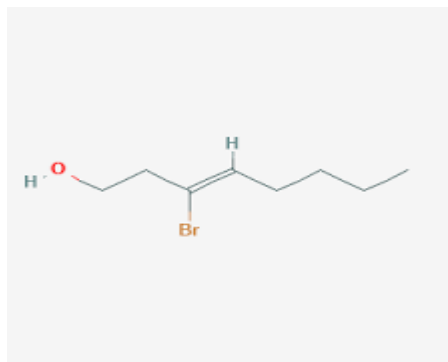
[A, 8; 2 each]

(a)



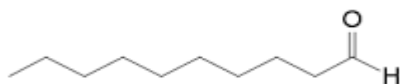
1-chloro-2,6-dimethyl-1,5-heptadiene

(b)



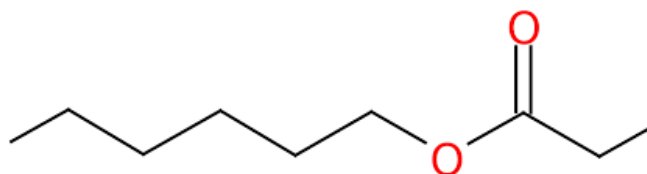
3-bromo-3-octene-1-ol

(c)



decanal

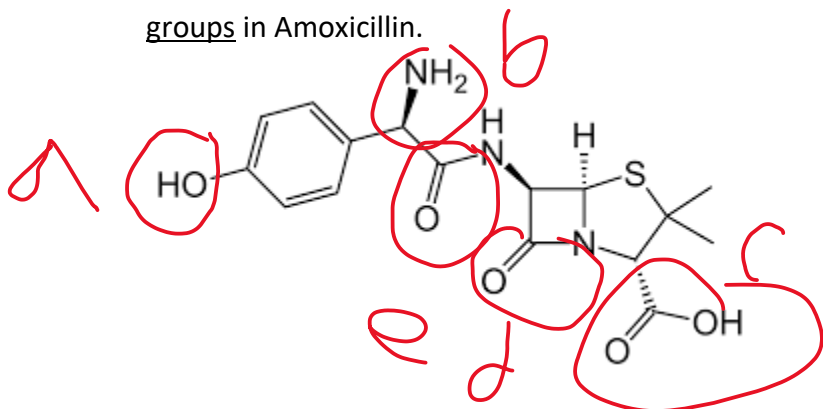
(d)



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]

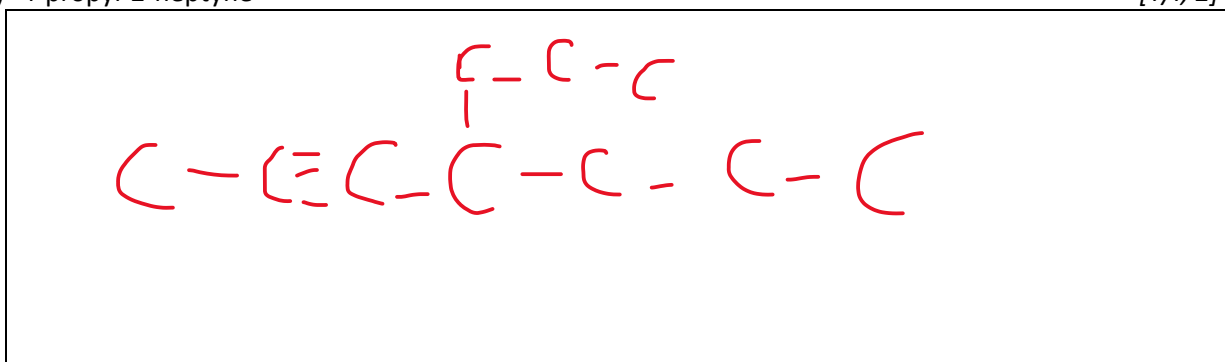
Name of Alcohol	1-pentanol, 3-methyl-1-butanol	2-methyl-1-butanol, 2,2-dimethyl-1-propanol
Structural Formula		

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

[T/I, 8: 2 each]

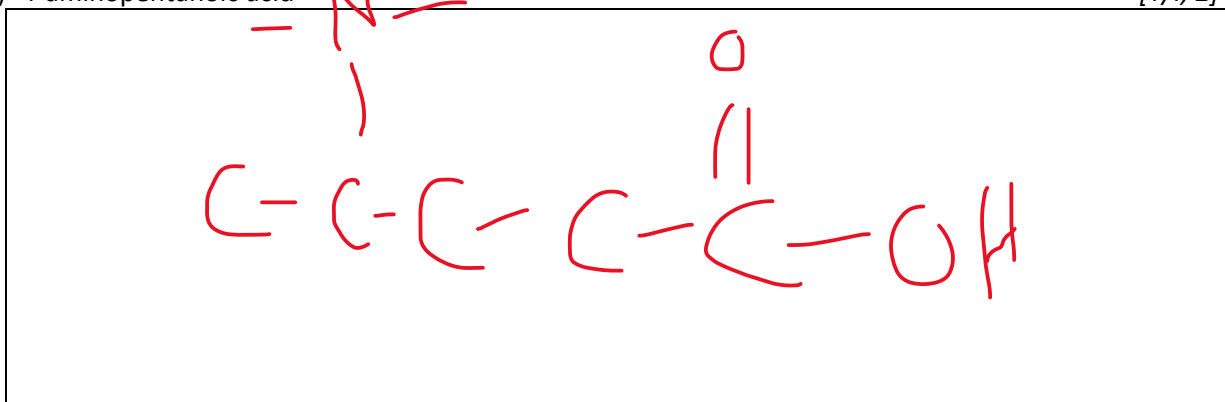
(a) 4-propyl-2-heptyne

[T/I, 2]



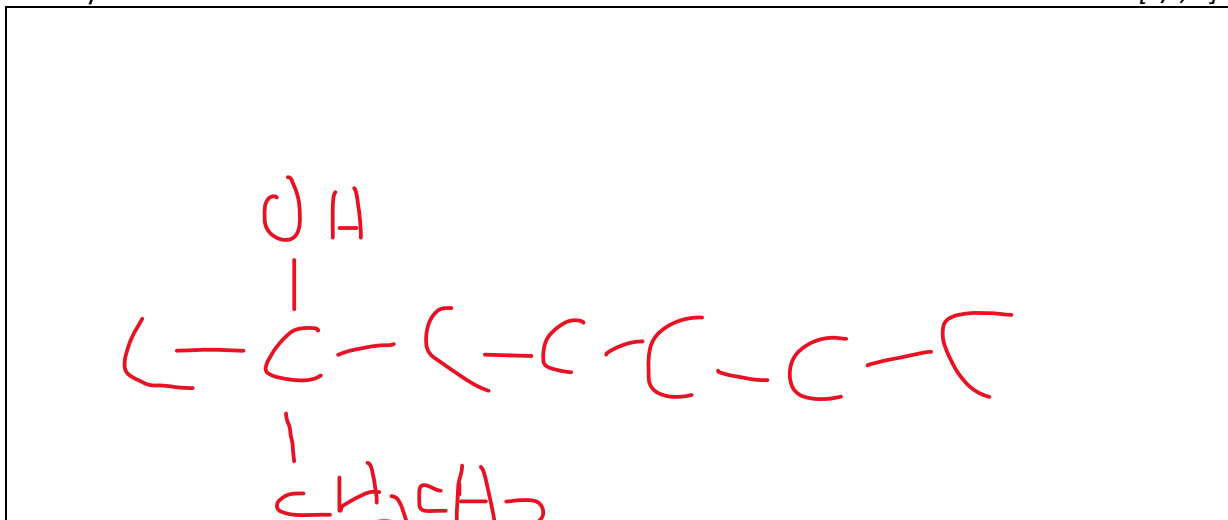
(b) 4-aminopentanoic acid

[T/I, 2]



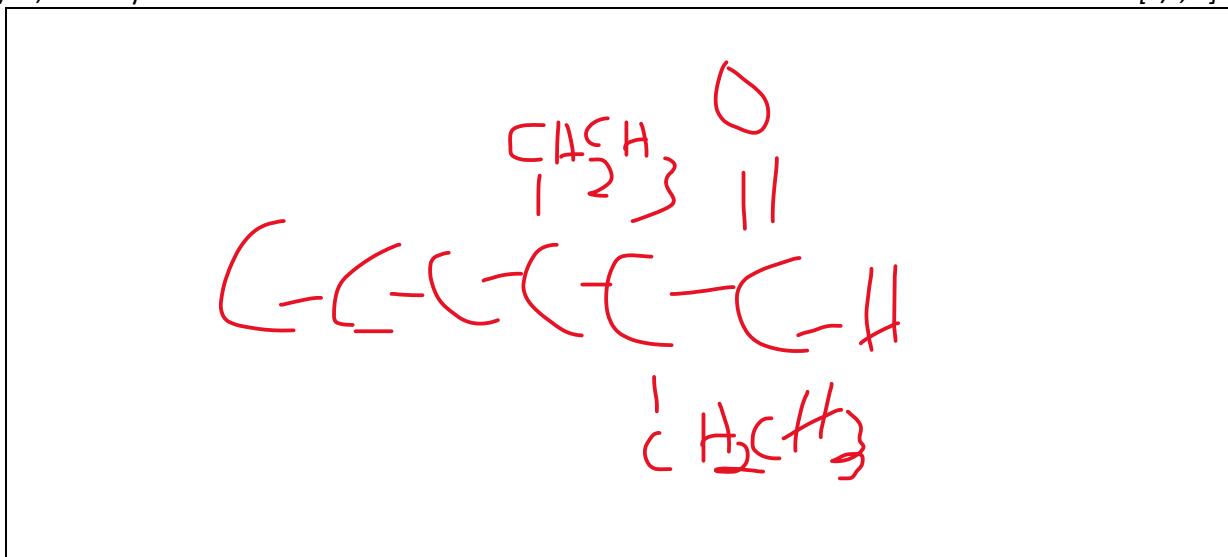
(c) 2-ethyl-2-hexanol

[T/I, 2]



(d) 2,3-diethyl hexanal

[T/I, 2]



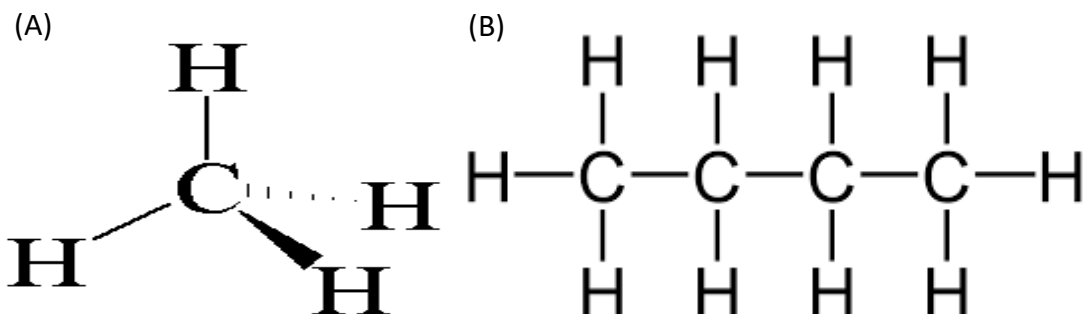
SECTION 3: Communication – Long Answer (Questions 17 - 18)

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 with 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:

- a) It has a longer hydrocarbon chain so more London dispersion forces can exist between molecules
- b) 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	Atomic # Symbol Name Atomic Mass																	2	He Helium 4.002602																																																				
2	Li Lithium 6.941	Be Beryllium 9.012182	C Solid Hg Liquid H Gas Rf Unknown										Metals Alkali metals Alkaline earth metals Lanthanoids Actinoids Transition metals Poor metals				Nonmetals Other nonmetals Noble gases				5	B Boron 10.811	6	C Carbon 12.0107	7	N Nitrogen 14.0067	8	O Oxygen 15.9994	9	F Fluorine 18.9984032	10	Ne Neon 20.1797																																								
3	Na Sodium 22.98976928	Mg Magnesium 24.3050	11	Al Aluminum 26.9815386	12	Si Silicon 28.0855	13	P Phosphorus 30.973762	14	S Sulfur 32.065	15	Cl Chlorine 35.453	16	Ar Argon 39.948	17	K Potassium 39.0983	18	Ca Calcium 40.078	19	Sc Scandium 44.955912	20	Ti Titanium 47.887	21	V Vanadium 50.9415	22	Cr Chromium 51.9961	23	Mn Manganese 54.938045	24	Fe Iron 55.845	25	Co Cobalt 58.933195	26	Ni Nickel 58.6934	27	Cu Copper 63.546	28	Zn Zinc 65.38	29	Ga Gallium 69.723	30	Ge Germanium 72.64	31	As Arsenic 74.92160	32	Se Selenium 78.96	33	Br Bromine 79.904	34	Kr Krypton 83.798																						
4	Rb Rubidium 85.4678	Sr Strontium 87.62	35	Y Yttrium 88.90585	36	Zr Zirconium 91.224	37	Nb Niobium 92.90638	38	Mo Molybdenum 95.96	39	Tc Technetium (97.9072)	40	Ru Ruthenium 101.07	41	Rh Rhodium 102.90550	42	Pd Palladium 106.42	43	Ag Silver 107.8682	44	Cd Cadmium 112.411	45	In Indium 114.818	46	Sn Tin 118.710	47	Sb Antimony 121.760	48	Te Tellurium 127.80	49	I Iodine 126.90447	50	Xe Xenon 131.293	51	Cs Caesium 132.9054519	52	Ba Barium 137.327	53	57-71			54	Hf Hafnium 178.49	55	Ta Tantalum 180.94788	56	W Tungsten 183.84	57	Re Rhenium 186.207	58	Os Osmium 190.23	59	Ir Iridium 192.217	60	Pt Platinum 195.084	61	Au Gold 196.966569	62	Hg Mercury 200.59	63	Tl Thallium 204.3833	64	Pb Lead 207.2	65	Bi Bismuth 208.98040	66	Po Polonium (208.9824)	67	At Astatine (208.9871)	68	Rn Radon (222.0178)
5	Fr Francium (223)	Ra Radium (226)	69	89-103			70	Rf Rutherfordium (261)	71	Db Dubnium (262)	72	Sg Seaborgium (266)	73	Bh Bohrium (264)	74	Hs Hassium (277)	75	Mt Meitnerium (288)	76	Ds Darmstadtium (271)	77	Rg Roentgenium (272)	78	Uub Ununbium (285)	79	Uut Ununtrium (284)	80	Uuq Ununquadium (289)	81	Uup Ununpentium (288)	82	Uuh Ununhexium (292)	83	Uus Ununseptium	84	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)