CHE 242 Exam UNIT 8

Name_____

W1912
CHE 242
UNIT EIGHT
SHERLOCK

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

1) Carboxylic acids boil at considerably higher temperatures than do alcohols, ketones, or aldehydes of similar molecular weights. This is because they:

A) are more acidic.

B) are hydrophobic.

C) form stable hydrogen-bonded dimers.

D) have a greater oxygen content.

E) none of the above.

2) Which of the following is the strongest acid?

A) chloroacetic acid B) trichloroacetic acid C) dichloroacetic acid D) acetic acid

3) Carboxylic acids can be made from Grignards by treating the Grignard reagents with:

A) carbon dioxide

B) aldehydes

C) carbon monoxide

D) esters

E) diborane

4) Esters and amides are most easily made by nucleophilic acyl substitution reactions on:

A) alcohols

B) carboxylates

C) acid chlorides

D) acid anhydrides

E) carboxylic acids

5) The combination of a carbonyl group and a hydroxyl group on the same carbon atom is called a _____ group.

A) carbamate B) carboxyl C) urethane D) carbonate E) carboxylate

6) Which of the following is the most reactive carboxylic acid derivative?

A) anhydride B) amide C) ester D) nitrile E) acid chloride

ANSWER ALL QUESTIONS

7) *N*-Methylacetamide is an example of:

A) a primary amide

B) a secondary amide

C) a tertiary amide

D) an imine

E) an *N, N*-disubstituted amide

8) Lithium aluminum hydride reduces carboxylic acids, acid chlorides, and esters to:

A) secondary alcohols.

B) ketones.

C) aldehydes.

D) tertiary alcohols.

E) primary alcohols.

9) Phthalic acid produces what acid derivative upon heating?

A) an acid chloride

B) an ester

C) an amide

D) a carboxylate

E) an anhydride

10) Cyclic amides are called:

A) lactones. B) imines. C) aminals. D) lactams. E) animals.

11) Cyclic esters are called:

A) lactams. B) lacrimals. C) lactones. D) enamines. E) imides.

12) While the carbonyl stretching frequency for simple aldeydes, ketones, and carboxylic acids is about 1710 cm^{-1}, the carbonyl stretching frequency for esters is about:

A) 2200 cm^{-1} B) 1700 cm^{-1} C) 1735 cm^{-1} D) 1660 cm^{-1} E) 1800 cm^{-1}

13) Peptide bonds are:

A) amide linkages.

B) ester linkages.

C) ether linkages.

D) imido linkages.

E) disulfide linkages.

14) How many standard amino acids are there?

A) 64 B) 4 C) 20 D) 12 E) 30

15) A protein bonded to a sugar residue would be classified as a:

A) glycoprotein.

B) lipoprotein.

C) metalloprotein.

D) nucleoprotein.

E) simple protein.

16) A protein bonded to a fat would be classified as a:

A) simple protein.

B) nucleoprotein.

C) glycoprotein.

D) metalloprotein.

E) lipoprotein.

17) The primary structure of a protein refers to:

A) the orientation of pleated sheets.

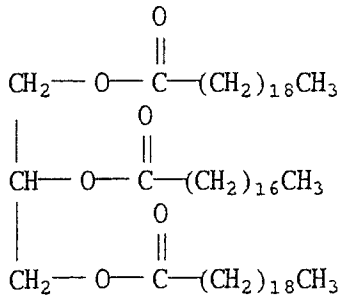
B) the orientation of peptide subunits within a complex protein.

C) the placement of the protein's active site.

D) the orientation of α-helices.

E) the sequence of its amino acids.

18) Which of the following terms best describes the compound below?



A) a saturated triglyceride

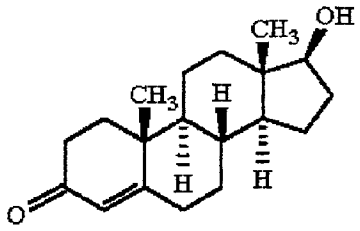
B) a lecithin

C) a prostaglandin

D) a wax

E) a terpene

19) Which of the following terms best describes the compound below?



A) a cephalin

B) a protein

C) a steroid

D) a sesquiterpene

E) an essential oil

20) Which of the following terms best describes the compound below?

$CH_3(CH_2)_{12}CO_2H$

A) a prostaglandin

B) a triglyceride

C) a fatty acid

D) a wax

E) a phosphatidic acid

21) Which of the following terms best describes the compound below?

$CH_3(CH_2)_7CH{=}CH(CH_2)_7CO_2H$

A) a synthetic detergent

B) an unsaturated fatty acid

C) a triglyceride

D) isoprene

E) a micelle

22) Which of the following is an advantage of using an alkylbenzenesulfonate detergent over a common soap?

A) The alkylbenzenesulfonate detergent has no hydrophobic region.

B) The alkylbenzenesulfonate detergent is uncharged.

C) Calcium, magnesium, and iron salts of sulfonic acids are soluble in water.

D) Greases are not emulsified by soaps.

E) Sulfonates are protonated at higher pH's than are carboxylates.

23) Oleic acid is an example of _____ fatty acid. A molecule of oleic acid contains a single carbon–carbon double bond and _____ carbon atoms.

A) an unsaturated; 9

B) a saturated; 18

C) an unsaturated; 18

D) a saturated; 9

E) a saturated; 52

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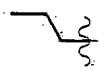
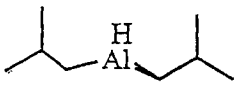
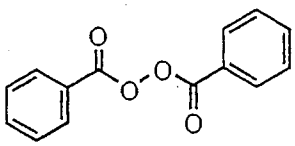
1 H 1.01					
3 Li 6.94	5 B 10.8	6 C 12.0	7 N 14.0	8 O 16.0	9 F 19.0
11 Na 22.9	13 Al 26.9	14 Si 28.0	15 P 30.9	16 S 32.0	17 Cl 35.5
19 K 39.1					35 Br 79.9
					53 I 127

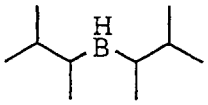
CH_3–	= Me	= methyl
CH_3CH_2–	= Et	= ethyl
	= Pr	= propyl or *n*-propyl
	= iPr	= isopropyl
	= Bu	= butyl or *n*-butyl
C_6H_5–	= Ph or ϕ	= phenyl
$PhCH_2$–	= Bn	= benzyl



DIBAH or DIBALH
diisobutylaluminum hydride



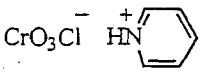
benzoyl peroxide
example of ROOR



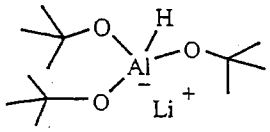
Sia_2BH
diisoamylborane

t-butyl group

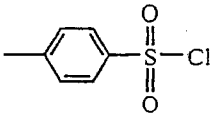
THF
tetrahydrofuran



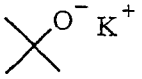
PCC, pyridinium chlorochromate



$LiAlH(Ot\text{-}Bu)_3$, lithium tri-*t*-butoxyaluminum hydride

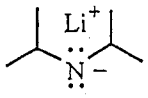


TsCl or TosCl
tosyl chloride

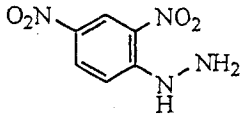


KO^tBu
potassium *tert*-butoxide

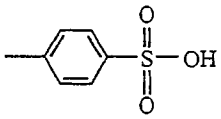
acetone



LDA, lithium diisopropylamide



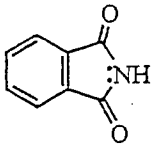
2,4-DNP or 2,4-DNPH
2,4-dinitrophenylhydrazine



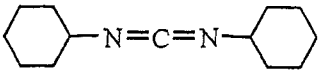
TsOH or TosOH
p-toluenesulfonic acid

Me_2S, dimethyl sulfide

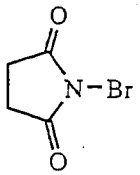
DMSO, dimethyl sulfoxide



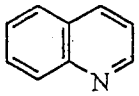
phthalimide



DCC
dicyclohexylcarbodiimide

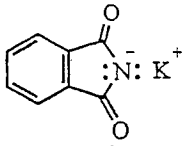


NBS
N-bromosuccinimide

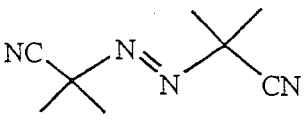


quinoline

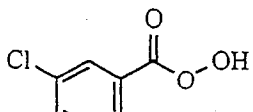
PYR
pyridine



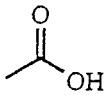
potassium phthalimide



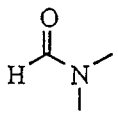
AIBN
azo-bis-isobutyronitrile



MCPBA
m-chloroperbenzoic acid
example of RCO_3H



AcOH
acetic acid



DMF
dimethylformamid