MIDTERM1

CHEM 109C

NAME:

Perm Number:

Table 22.1 Configurations of the D-Aldoses

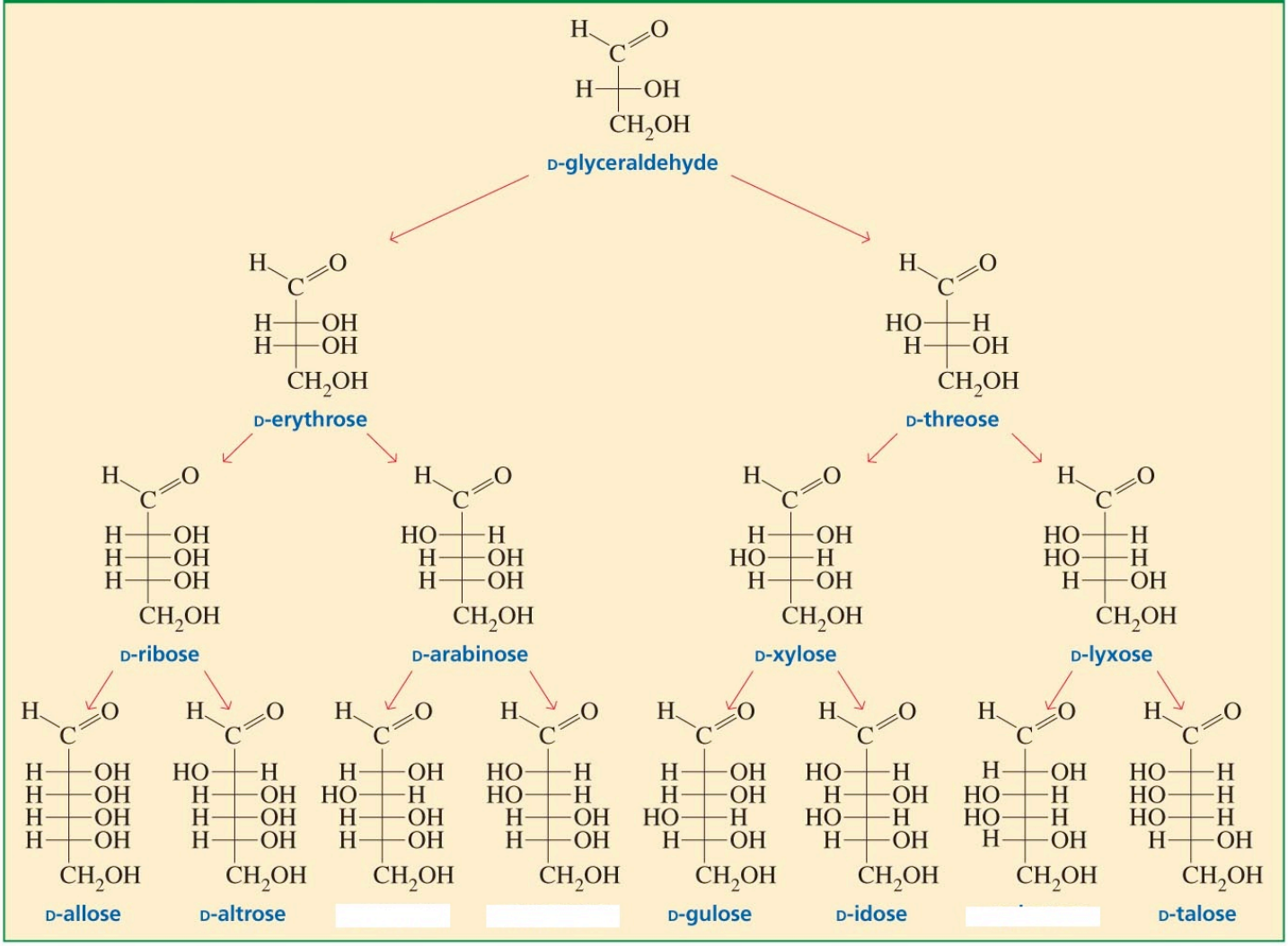

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Table 22.2 Configurations of the D-Ketoses

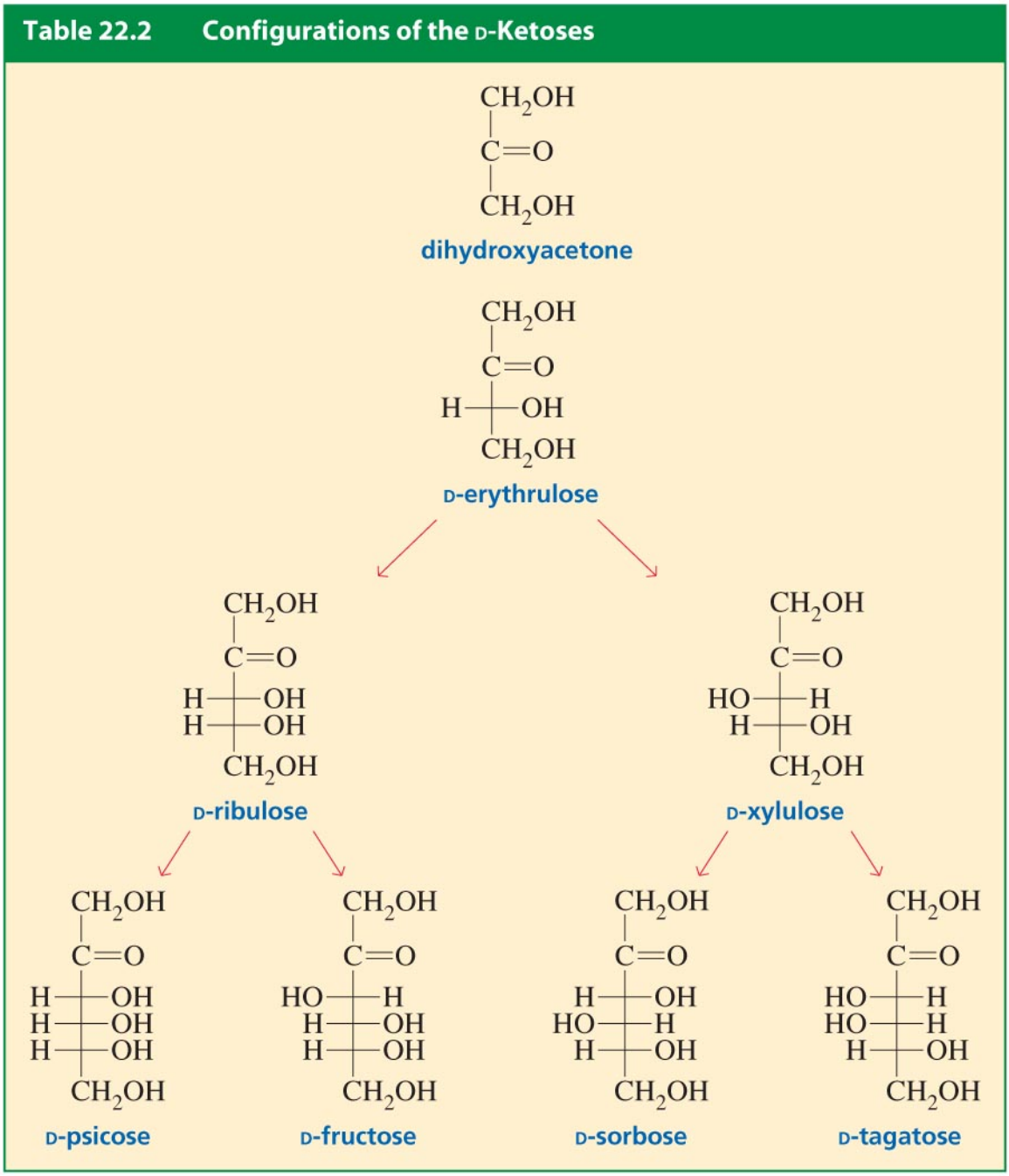

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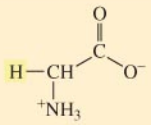
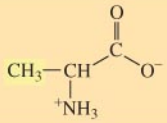
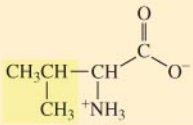
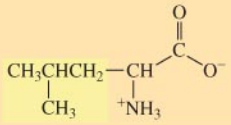
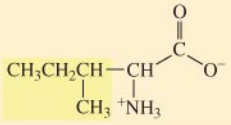
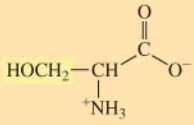
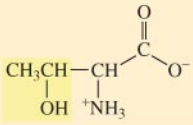
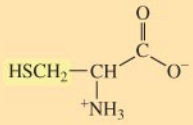
Table 23.2 The Most Common Naturally Occurring Amino Acids.
The amino acids are shown in the form that predominates at physiological pH (7.3).

	Formula	Name	Abbreviations		Average relative abundance in proteins
Aliphatic side-chain amino acids		Glycine	Gly	G	7.5%
		Alanine	Ala	A	9.0%
		Valine*	Val	V	6.9%
		Leucine*	Leu	L	7.5%
		Isoleucine*	Ile	I	4.6%
Hydroxy-containing amino acids		Serine	Ser	S	7.1%
		Threonine*	Thr	T	6.0%
Sulfur-containing amino acids		Cysteine	Cys	C	2.8%

(*Continued*)

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Table 23.2 Continued

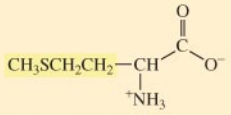
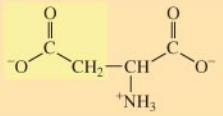
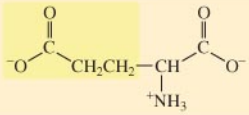
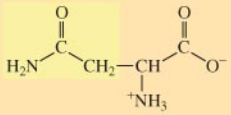
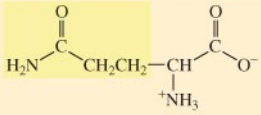
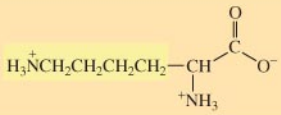
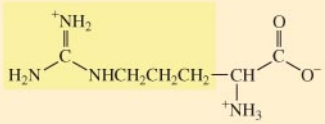
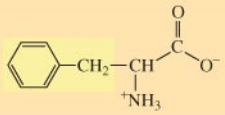
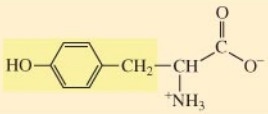
	Formula	Name	Abbreviations		Average relative abundance in proteins
		Methionine*	Met	M	1.7%
Acidic amino acids		Aspartate (aspartic acid)	Asp	D	5.5%
		Glutamate (glutamic acid)	Glu	E	6.2%
Amides of acidic amino acids		Asparagine	Asn	N	4.4%
		Glutamine	Gln	Q	3.9%
Basic amino acids		Lysine*	Lys	K	7.0%
		Arginine*	Arg	R	4.7%
Benzene-containing amino acids		Phenylalanine*	Phe	F	3.5%
		Tyrosine	Tyr	Y	3.5%

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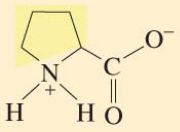
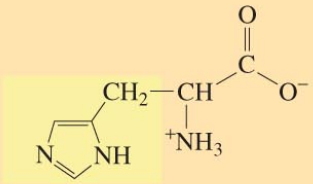
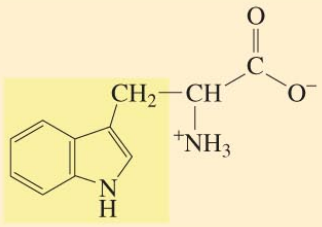
Table 23.2 Continued

	Formula	Name	Abbreviations		Average relative abundance in proteins
Heterocyclic amino acids		Proline	Pro	P	4.6%
		Histidine*	His	H	2.1%
		Tryptophan*	Trp	W	1.1%

* Essential amino acid

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Table 23.3 The pK_a Values of Amino Acids

Amino acid	pK_a α-COOH	pK_a α-$\overset{+}{N}H_3$	pK_a Side chain
Alanine			—
Arginine			12.48
Asparagine			—
Aspartic acid			3.86
Cysteine			8.35
Glutamic acid			4.25
Glutamine			—
Glycine			—
Histidine			6.04
Isoleucine			—
Leucine			—
Lysine			10.79
Methionine			—
Phenylalanine			—
Proline			—
Serine			—
Threonine			—
Tryptophan			—
Tyrosine			10.07
Valine			—

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