CHEM 4401 Exam 2
Study List

CH	Item	Topic	Question
3	1	Common structural features of amino acids	
3	2	stereochemistry of amino acids	
3	3	nonpolar, aliphatic amino acid characteristics	
3	4	aromatic amino acid characteristics	
3	5	polar, uncharged amino acid characteristics	
3	6	positively charged amino acid characteristics	
3	7	negatively charged amino acid characteristics	
3	8	3-letter & 1-letter aa abbreviations	
3	9	non-standard aa's: how made, functions	
3	10	aa acidic groups: ID, relative pKa values,form @ given pH	
3	11	isoelectric point (pI): definition, calculation	
3,4	12	peptide bond: ID, characteristics	
3,4	13	Ramachandran plots, phi & psi angles	
3,4	14	peptides & proteins: N- and C-termini	
3,4	15	protein pI points:definitions, net charge @ given pH	
3,4	16	Driving forces behind protein folding	
3,4	17	primary protein structure	
3,4	18	Secondary protein structure: alpha helix characteristics	
3,4	19	Secondary structure: beta strand/sheet characteristics	
3,4	20	secondary structure:beta turn characteristics	
3,4	21	supersecondary structure	
3,4	22	tertiary structure:definition/globular&fibrous proteins/domains	
3,4	23	quarternary structure: definition/nomenclature/bonding	
3,4	24	limits to protein size:why?	
3,4	25	natural chemical modification of proteins: how & why?	
5	26	ligands: definition, characteristics of binding	
5	27	O2 binding proteins: why needed?	
5	28	role/structure of heme	
5	29	Kd: definition, significance	
5	30	theta (θ): definition, significance	
5	31	plot of θ vs. [L], estimation of Kd	
5	32	plot of θ vs. [L] (pO2) for myoglobin: significance	
5	33	Hb characteristics/purpose	
5	34	T vs R states: relationship to Hb conformation	
5	35	T<==> R transitions: why, how?, significance	
5	36	Plot of θ vs pO2:implications for O2 affinity, binding, release	
5	37	allosteric proteins: definition	
5	38	allosteric modulators:definition/nomenclature	
5	39	ID of cooperative binding: Hill Plot	
5	40	Cooperative binding: Concerted vs. Sequential models	
5	41	Bohr effect:definition, effect on T/R state, O2 affinity, binding	
5	42	Hb and CO2 binding: effect on T/R state, O2 affinity, binding	
5	43	2,3 BPG: effect on T/R state, O2 binding, affinity	
5	44	Immune system: answer questions in study guide	
5	45	Protein motors(actin-myosin):answer questions in study guide	

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6	46	Enzymes: Definition/function/nomenclature	
6	47	enzyme cofactors & coenzymes: what do they do? (general)	
6	48	Basic K_{eq} calculations	
6	49	Relationship of K_{eq} to ΔG (exergonic, endergonic)	
6	50	Factors that affect how fast a reaction occurs	
6	51	Activation energy barrier	
6	52	Difference between ΔG and $\Delta G^{\neq}$	
6	53	Transition state intermediates:definition/significance	
6	54	How do enzymes lower activation energy barriers?	
6	55	Binding energy: role in enzymatic activity	
6	56	Effect of Rate limiting step on chemical reactions	
6	57	relationship of kinetics to chemical reaction mechanisms	
6	58	Michaelis constant (Km): definition/how estimated?	
6	59	Vmax:definition	
6	60	Significance of Michaelis-Menten, Lineweaver-Burke Plots	
6	61	Significance of Michaelis-menten equation	
6	62	Turnover number (kcat): definition and significance	
6	63	Specificity constant:definition and significance	
6	64	Lineweaver-Burke plots:reaction mechanisms, inhibition	
6	65	Enzyme inhibtion: reversible (competitive, uncompetitive)	
6	66	Enzyme inhibition: irreversible	
6	67	effect of pH on enzyme activity	
6	68	Enzyme catalysis: Acid:base catalysis	
6	69	Enzyme catalysis: covalent catalysis	
6	70	Enzyme catalysis: Metal ion catalysis	
6	71	Enzyme regulation: allosteric enzymes	
6	72	Enzyme regulation:reversible, covalent regulation	
6	73	Enzyme regulation: zymogens	