

DENTAL ADMISSION TEST TEST SPECIFICATIONS

2007

The Dental Admission Test (DAT) is computer-based testing program, which is designed to measure general academic ability, comprehension of scientific information, and perceptual ability. The examination is comprised of a battery of four tests of multiple-choice items. The DAT includes:

Quantitative Reasoning Test	40 items
Perceptual Ability Test	90 items
Reading Comprehension Test	50 items
Survey of the Natural Sciences	100 items

QUANTITATIVE REASONING

40 items

I. Mathematics Problems (30)

- A. Algebra (9)
 - 1. Equations and expressions
 - 2. Inequalities
 - 3. Exponential notation
 - 4. Absolute value
 - 5. Ratios and proportions
 - 6. Graphical analysis
- B. Numerical calculations (6)
 - 1. Fractions and decimals
 - 2. Percentages
 - 3. Approximations
 - 4. Scientific notation
- C. Conversions (3)
 - 1. Temperature
 - 2. Time
 - 3. Weight
 - 4. Distance
- D. Probability and statistics (4)
- E. Geometry (4)
- F. Trigonometry (4)

II. Applied Mathematics (Word) Problems (10)

SURVEY OF THE NATURAL SCIENCES: Biology

40 items

I. Cell and Molecular Biology (13)

- A. Origin of Life
- B. Cell metabolism (including photosynthesis)/ Enzymology
- C. Cellular Processes
- D. Thermodynamics
- E. Organelle structure and function
- F. Mitosis/ Meiosis
- G. Cell structure
- H. Experimental cell biology

II. Diversity of Life: Biological Organization and Relationship of Major Taxa (Five-Kingdom System) (3)

- A. Monera
- B. Plantae
- C. Animalia
- D. Protista
- E. Fungi
- F. Etc

III. Structure and Function of Systems (9)

- A. Integumentary
- B. Skeletal
- C. Muscular
- D. Circulatory
- E. Immunological
- F. Digestive
- G. Respiratory
- H. Urinary
- I. Nervous/senses
- J. Endocrine
- K. Reproductive

IV. Developmental Biology (4)

- A. Fertilization
- B. Descriptive embryology
- C. Developmental mechanisms
- D. Experimental embryology

V. Genetics (7)

- A. Molecular genetics
- B. Human genetics
- C. Classical genetics
- D. Chromosomal genetics
- E. Genetic technology

VI. Evolution, Ecology, and Behavior (4)

- A. Natural Selection
- B. Population genetics/Speciation
- C. Cladistics
- D. Population and community ecology
- E. Ecosystems
- F. Animal behavior (including social)

SURVEY OF NATURAL SCIENCES: General Chemistry

30 items

I. Stoichiometry and General Concepts (3)

- A. Percent composition
- B. Empirical formulae
- C. Balancing equations
- D. Moles and molecular formulas
- E. Molar mass
- F. Density
- G. Calculations from balanced equations

II. Gases (2)

- A. Kinetic molecular theory of gases
- B. Dalton's gas law
- C. Boyle's gas law
- D. Charles's gas law
- E. Ideal gas law

III. Liquids and Solids (3)

- A. Intermolecular forces
- B. Phase changes
- C. Vapor pressure
- D. Structures
- E. Polarity
- F. Properties

IV. Solutions (3)

- A. Polarity
- B. Properties
 - 1. Colligative
 - 2. Non-colligative
- C. Forces
- D. Concentration calculations

V. Acids and Bases (3)

- A. pH
- B. Strength
- C. Brønsted-Lowry reactions
- D. Calculations

VI. Chemical Equilibria (2)

- A. Molecular
- B. Acid/base
- C. Precipitation
- D. Calculations
- E. Le Chatelier's principle

VII. Thermodynamics and Thermochemistry (2)

- A. Laws of thermodynamics
- B. Hess's law
- C. Spontaneity
- D. Enthalpies and entropies
- E. Heat transfer

VIII. Chemical Kinetics (2)

- A. Rate Laws
- B. Activation Energy
- C. Half-life

IX. Oxidation-Reduction Reactions (2)

- A. Balancing equations
- B. Determination of oxidation numbers
- C. Electrochemical calculations
- D. Electrochemical concepts and terminology

X. Atomic and Molecular Structure (3)

- A. Electron configuration
- B. Orbital types
- C. Lewis-Dot diagrams
- D. Atomic theory
- E. Quantum theory
- F. Molecular geometry
- G. Bond types
- H. Sub-atomic particles

XI. Periodic Properties (2)

- A. Representative elements
- B. Transition elements
- C. Periodic trends
- D. Descriptive chemistry

XII. Nuclear Reactions (1)

- A. Balancing equations
- B. Binding energy
- C. Decay processes
- D. Particles
- E. Terminology

XIII. Laboratory (2)

- A. Basic Techniques
- B. Equipment
- C. Error analysis
- D. Safety
- E. Data analysis

SURVEY OF THE NATURAL SCIENCES: Organic Chemistry

30 items

I. Mechanisms: Energetics, Structure, and Stability of Intermediates (5)

- A. S_N1
- B. S_N2
- C. Elimination
- D. Addition
- E. Free radical
- F. Substitution mechanisms

II. Chemical and Physical Properties of Molecules and Organic Analysis (5)

- A. Inter- and intra-molecular forces
- B. Separation
- C. Introductory infrared spectroscopy
- D. ¹H NMR spectroscopy
- E. ¹³C NMR
- F. Chemical identification
- G. Stability
- H. Solubility
- I. Polarity

III. Stereochemistry (3)

- A. Conformational analysis
- B. Geometric isomers
- C. Stereoisomers (Enantiomers, Diastereomers, Meso compounds)
- D. Optical activity (Planes of Symmetry)

IV. Nomenclature (2)

- A. IUPAC rules
- B. Functional groups in molecules

V. Individual Reactions of the Major Functional Groups and Combinations of Reactions to Synthesize Compounds (9)

- A. Carbon-to-carbon bond formation
- B. Functional groups conversions
- C. Multistep synthesis
- D. Redox reactions
- E. Name reactions
 - 1. Grignard
 - 2. Wittig
 - 3. Diels-Adler
 - 4. Aldol reaction

VI. Acid-Base Chemistry (3)

- A. Resonance effects
- B. Inductive effects
- C. Prediction of products and equilibria

VII. Aromatics and Bonding (3)

- A. Concept of aromaticity
- B. Resonance
- C. Atomic/molecular orbitals
- D. Hybridization
- E. Bond angles/lengths