Requirements and Recommended Literature for Entrance Test Pharmacy

BIOLOGY

Campbell Biology
Jane Reece, Lisa A. Urry, Michael L. Cain, Steven A. Wasserman, Peter V. Minorsky, Robert B. Jackson
Pearson; 10th edition
ISBN-13: 978-0321775658

Anatomy and Physiology in Healthcare
By (author) Paul Marshall , By (author) Beverly Gallacher , By (author) Jim Jolly , By (author) Shupikai Rinomhota,
Publisher Scion Publishing Ltd
ISBN10 190484295X

Botany: An Introduction To Plant Biology 4th Edition
By James Mauseth
ISBN-13: 978-0763753450
ISBN-10: 0763753459

Or any other secondary school textbook including the following topics:

GENERAL BIOLOGY

Variety of life
- Classification and taxonomy
- Prokaryotes and eukaryotes
- Viruses
- Bacteria
- Fungi

Chemical composition of the cell
- Proteins
- Carbohydrates
- Lipids
- Nucleic acids

Cells
- Structure and function of prokaryotic cells
- Importance of prokaryotes
- Structure and function of all organelles of eukaryotic cells
- Animal and plant cells

Transport across biological membranes
- Passive movement – simple and facilitated diffusion
- Active movement – active transport
- Osmosis in plant and animal cell

Energy utilization

- Glycolysis
- Electron-transport chain
- Oxidative phosphorylation
- ATP synthesis
- Photosynthesis

Cell cycle and reproduction

- Mitosis
- Meiosis

Expression of genetic information

- DNA replication
- Transcription
- Translation

Genetics

- Nature of genes
- Chromosomes
- Mendelian genetics
- Morgan laws
- Gene linkage

Monogenic and multifactorial inheritance

- Population genetics

Evolution

- Theories of the origin of life
- Theories of evolution
- Evolution of prokaryotes
- Evolution of plants
- Evolution of animals
- Human evolution

HUMAN BIOLOGY

- Basics of cardiovascular system anatomy and physiology (heart)
- Basics of the respiratory system anatomy and physiology (lungs)
- Basics of the digestive system anatomy and physiology (small intestine, large intestine, liver, pancreas)
- Basics of the urinary system anatomy and physiology (kidney)
- Basics function of hormones

BOTANY

- Basics of anatomy of plants (cytology, histology, organology)
- Basics from physiology
    - Basic processes in plants (photosynthesis)

- Primary metabolism
- Secondary metabolism
- Plant hormones
- Basic secondary metabolites (alkaloids, isoprenoids, glycosides, phenolic compounds)
- Pharmaceutically important plant families
  - Introduction into the botanical system (botanical nomenclature and plant taxonomy; Algae, Fungi, Pteridophytes, Gymnosperms and Angiosperms - important plant species for pharmacy)

CHEMISTRY

Caret, R. L., Denniston, K. J., Topping, J. J.:

Principles and Applications of Inorganic, Organic and Biological Chemistry. Wm. C. Brown Publ.,1993

ISBN: 0-697-12001-5

Or any other secondary school textbook (A-level) including the following topics:

Atoms, Molecules, And Ions

- the electronic structure of atoms

Chemical Periodicity

- the periodic law, periodic system of the elements, characterization of periodic table

Chemical Bonds

- ionic bond, covalent bond (configuration, multiple bonds, coordinate covalent bonds), metallic bond

Intermolecular Forces

- dipole-dipole forces, hydrogen bond, hydrophobic forces

Chemical Thermodynamics, Thermochemistry

- The laws of thermodynamics, exothermic and endothermic reactions

Chemical Kinetics

- reaction rates, activation energy, catalysis

Chemical Equilibrium

- the law of chemical equilibrium, factors that influence equilibria

Acids and Bases

- Bronsted-Lowry acids and bases, conjugate pairs, amphoterism, polyprotic acids and bases, ionization equilibrium of water, pH and pK definitions

Ions and Ionic Equilibria

- reactions of ions with water, pH of salt solutions, reactions of acids with bases, buffer solutions

Oxidation and Reduction

- defining oxidation and reduction, balancing oxidation-reduction reactions

Calculations

- Strengths of oxidizing and reducing agents, concentration of solutions, dilution of solutions, pH values of strong and weak acids and bases and buffers, balancing chemical reactions, acid-base titration

Inorganic Chemistry

- characterization of representative elements and transition elements, nomenclature of inorganic compounds

Organic Chemistry

- structure of organic compounds, nomenclature, isomerism, reactions of organic compounds mentioned below
- straight-chain and branched hydrocarbons (saturated and unsaturated), cyclic hydrocarbons, aromatic system
- derivatives of hydrocarbons - halogen derivatives, nitrogen derivatives (nitrocompounds, amines), alcohols, phenols, quinones, ethers, thioalcohols, disulphides, aldehydes, ketones, carboxylic acids and their derivatives (esters, amides, halogenides, anhydrides and derivatives formed by replacing of hydrogen in hydrocarbon skeleton)
- heterocyclic compounds - O-, S-, N-containing heterocycles

Carbohydrates

- D- and L-configurations, optical activity, hemiacetal formation, formulas, O-glycosidic bond, disaccharides and polysaccharides

Lipids and Steroids

- anomerism
- structure of saturated and unsaturated fatty acids, fats and waxes, phospholipids, steroid nucleus, "boat" and "chair" conformation

Peptides and Proteins

- formulas of amino acids, peptide bond, structure and classification of proteins

Nucleic Acids

- pyrimidine and purine bases, ribose and deoxyribose, N-glycosidic bond, nucleotides, base pairing, structure of DNA and RNAs