SSAT Syllabus for ECAT

Subject	Chapter / Topics
MATHEMATICS	Functions, types of functions, real valued functions, horizontal and vertical line test, tests of symmetry, graphs of functions, compress stretch, and shift conditions. Domain and range, implicit, explicite, parametric, logarithmic, exponential, Hyperbolic, Inverse hyperbolic, piece wise etc functions. Even and odd functions, composition of functions, inverse functions. limits and continuity, criteria of finding limits and continuity at a point or on an interval algebraically or graphically, convergence of a sequence by limit on nth term. Average and instantaneous rate of change, slopes of tangents, derivatives of any order. Differentiability at a point or on an interval. Maclaurin's and Taylor's series, increasing and decreasing functions, extrema and concavity. Critical points, point of inflection.
PHYSICS	Electrostatics, Current Electricity, Electromagnetism
STATISTICS	Normal Distribution – Properties, Standard Normal Curve, Z-scores Sampling Techniques & Sampling Distribution – Types of Sampling, Sampling Errors, Distribution of Sample Mean/Proportion Simple Linear Regression & Correlation – Scatter Diagrams, Regression Line, Correlation Coefficient
CHEMISTRY	1 Fundamental Principles of Organic Chemistry 2 Alphatic Hydrocarbons 3 Aromatic Hydrocarbons 4 Alkyl Halides 5 Alcohols, Phenols and ethers
COMPUTER	1 Introduction to programming, C/C++, Language translators 2 Variables, Keywords, Constants, Operators, comments, data types in C/C++ 3 Input/Output in C/C++ => printf/scanf, cout/ cin, format specifiers, escape sequences etc 4 Control structures (Sequence, Selection, Loops) 5 Functions in C/C++
ENGLISH	1. Sentence Completion 2. Analogy 3. Vocabulary • Synonyms • Antonyms 4. Preposition 5. Reading Comprehension 6. Identification of Part of Speech

SSAT Syllabus for MDCAT

Subject	Chapter / Topics
BIOLOGY	**1. HOMEOSTASIS** • **Homeostasis (kidney specifically)** 15.1. Explain different organs of urinary system. Describe the structure of kidney and relate it with its function. 15.2. Explain the processes of glomerular filtration, selective re-absorption and tubular secretion as the events in kidney functioning. 15.3. Justify the functioning of kidneys as both excretion and osmoregulation. 15.4. Compare the function of two major capillary beds in kidney i.e. glomerular capillaries and peritubular capillaries. 15.5. Explain the causes and treatments of kidney stones. 15.6. Outline the causes of kidney failure. • **Thermoregulation** 15.7. Describe thermoregulation and explain its needs. • **Excretion** 15.8. List various nitrogenous compounds excreted during the process of excretion. **2. Coordination and control/nervous & chemical coordination** • **Receptors** 5.1. Recognize receptors as transducers sensitive to various stimuli. • **Neurons** 5.2. Explain the structure of a typical neuron (cell body, dendrites, axon and myelin sheath 5.3. Define nerve impulse 5.4. Classify reflexes 5.5. Briefly explain the functions of components of a reflex arc" • **Brain** 5.6. Discuss the main parts of the brain (e.g., components of brain stem, mid brain, cerebellum, cerebrum) 5.7. Describe the functions of each part. **3. Reproduction** • **Human Reproductive system** 8.1. Describe the functions of various parts of the male & female reproductive systems and the hormones that regulate those functions

	• **Menstrual cycle** 8.2. Describe the menstrual cycle (female reproductive cycle) emphasizing the role of hormones • **Sexually transmitted diseases** 8.3. List the common sexually transmitted diseases along with their causative agents and main symptoms
PHYSICS	**Electrostatics** Learning Outcomes: Coulomb's Law, Electric Field Strength, Electric Field Lines, Electric Potential & Electric field as Potential Gradient, Electric field intensity due to an infinite sheet of charge, Charging and Discharging a Capacitor. **Current Electricity** Learning outcomes: OHM's Law, Electrical resistance, Specific resistance of resistivity, Effect of temperature on resistance, Temperature coefficient of resistance, Variation of resistivity with temperature, Concept of steady current, Internal resistance of a supply, Conditions for maximum power transfer, Electric power. **Electromagnetism** Learning outcomes: Magnetic field. Magnetic flux, Magnetic flux density, force acting on a charged particle in a uniform magnetic field.

CHEMISTRY	**13. FUNDAMENTAL PRINCIPLES OF ORGANIC CHEMISTRY** **Definition and Classification of Organic Compounds** 13.1 Define organic chemistry and organic compound 13.2 Classify organic compounds on structural basis **Functional Group** 13.3 Define functional group **Isomerism** 13.4 Explain stereoisomerism and its types
	14. CHEMISTRY OF HYDROCARBONS Nomenclature of Alkanes 14.1 Describe the nomenclature of Alkanes **Free Radical Mechanism** 14.2 Define Free Radical Initiation, propagation and termination. 14.3 Describe the mechanism of the free radical substitution in alkanes exemplified by Methane and Ethane **Nomenclature of Alkenes** 14.4 Explain the IUPAC nomenclature of alkenes **Shapes of Alkenes**

14.5 Explain the shapes of the Ethene molecules in terms of Sigma and Pi C-C Bonds

Structure and Reactivity of Alkenes

14.6 Describe the structure and reactivity of Alkenes as exemplified by Ethene

Preparation of Alkanes

14.7 Explain Dehydration of Alcohols and Dehydrohalogenation of RX for the preparation of Ethene

MOT of Benzene Resonance and Resonance Energy

14.8 Explain the shape of Benzene Molecules (Molecular orbital treatment).

14.9 Define resonance, resonance energy and relative stability.

Reactivity of Benzene

14.10 Compare the reactivity of benzene with alkanes and alkenes

Chemical Reactions of Benzenes

14.11 Define addition reactions of benzene and methylbenzene.

14.12 Describe the mechanism of electrophilic substitution in **Benzene.**

14.13 Discuss chemistry of benzene and methylbenzene by nitration, sulphonation, halogenation, Friedal Craft's Alkylation and acylation.

Effect of Substituents

14.14 Apply the knowledge of positions of substituents in the electrophilic substitution of benzene

IUPAC System of Alkynes

14.15 Use the IUPAC naming System of Alkynes

Preparation of Alkynes

14.16 Describe the preparation of Alkynes using elimination reactions.

Acidity of Alkynes

14.17 Describe the acidity of alkynes

Reactions of Alkynes

14.18 Discuss chemistry of alkynes by hydrogenation, hydro halogenation and hydration

Substitution vs Addition

14.19 Describe and differentiate between substitution and Addition reactions.

15. ALKYL HALIDES

Nomenclature Structure and Reactivity

15.1 Name Alkyl Halides using IUPAC system.

15.2 Discuss the structure and reactivity of RX

Substitution vs Elimination

15.3 Describe the mechanism and types of nucleophilic substitution reactions.

15.4 Describe the mechanism and types of elimination reactions

16. ALCOHOLS AND PHENOLS

Nomenclature, structure and reactivity of Alcohol

16.1 Explain nomenclature and structure of Alcohols.

16.2 Explain the reactivity of Alcohols

16.3 Describe the chemistry of alcohols by preparation of ethers and esters

Nomenclature, structure and reactivity of Phenols

16.4 Explain the nomenclature, structure and reactivity of Alcohol

16.5 Discuss the reactivity of phenol and their chemistry by electrophilic aromatic substitution

Alcohols and Phenols

16.6 Differentiate between an alcohol and phenol

ENGLISH	1. Verb Tenses 2. Subject Verb Agreement 3. Preposition 4. Adjective, Adverb 5. Pair of Words ……...1st year 6. Idioms…….. 2nd year 7. Vocabulary (Intermediate level) • Synonyms • Antonyms • Sentence completion • Spelling errors 8. Reading Comprehension • Short Passages
LOGICAL REASONING	1. Logical Problems 2. Logical Deductions 3. Analogy 4. Course of action 5. Cause and affect