MILLAT TALENT SEARCH EXAMINATION (MTSE)
SYLLABUS FOR EXAMINATION SCHEDULED FOR 2024-2025

MATHEMATICS	$(25 \times 4 = 100M)$

Chapter 1: Real Numbers

- Introduction, Fundamental Theorem of Arithmetic, Revisiting Irrational numbers, Revisiting Rational Numbers and Their Decimal Expansion.

Chapter 2: Polynomials

- Introduction, Geometrical Meaning of the Zeroes of a Polynomial,Relationship between Zeroes and Coefficients of a Polynomial.

Chapter 3: Pair of Linear Equations in Two Variables

- Introduction, Pair of Linear Equation in Two variables, Graphical Method of solution of a Pair of Linear Equation, Algebraic Methods of solving a Pair of Linear Equation, Substitution Method, elimination Method.

Chapter 4: Quadratic Equations

- Introduction, Quadratic Equations, Solutions of a Quadratic Equation byFactorisation and by using quadratic formula, Nature of Roots.

Chapter 5: Arithmetic Progression

- Introduction, Arithmetic Progression, n^{th} Term of an AP, Sum of First nTerms of an AP.

Chapter 6: Triangles

- Introduction, Similar Figures, Similarity of Triangles, Criteria for Similarityof Triangles.

Chapter 7: Coordinate Geometry

- Introduction, Distance Formula, Section Formula.

Chapter 8: Introduction to Trigonometry

- Introduction, Trigonometric Ratios, Trigonometric Ratios of some Specific angles $(0°, 30°, 45°, 60°, 90°)$. Trigonometric Identities.

Chapter 9: Some Applications of Trigonometry

- Introduction, problems on Heights and Distances.

Chapter 10: Circles

- Introduction, Tangent and Secant of a circle, Number of Tangents from a Point on a Circle.

Chapter 11: Areas Related to Circles

- Introduction, Perimeter and Area of a Circle – A Review, Areas of Sector and Segment of a Circle, Areas of combination of Plane Figures.

Chapter 12: Surface Areas and Volumes

- Introduction, surface Area of a Combination of Solids, Volume of a Combination of solids.

Chapter 13: Statistics

- Introduction, Mean of Grouped Data, Mode of Grouped Data, Median of Grouped data.

Chapter 14: Probability

- Introduction, classical definition of probability, problems on finding the probability of an event.

BIOLOGY	$(10 \times 4 = 40M)$

Chapter 1: How do Organisms Reproduce

- Types of reproduction, Modes of asexual reproduction, Sexual reproduction in plants, Sexual reproduction in animals, Reproduction in humans, Male and female reproductive system, Gestation period, Reproductive health.

Chapter 2: Control and coordination

- Control and coordination, Plant hormones, Response to stimulus in plants,Nervous system: Human nervous system, Hormones in animals, The endocrine system, Feedback mechanism, Different control centres in the nervous system, Mechanism of reflex action.

Chapter 3: Heredity and evolution

- Heredity, Mendel's Experiment, Sex determination, Evolution, Evidences for evolution, Lamarckism, Darwin's theory, Speciation, Human evolution, Chromosomal disorders

Chapter 4: Respiration – a life process

- Discovery of gases involved in respiration, Respiration in Plants, Respiration through roots, Fermentation, Transportation of gases in plants, Stages of respiration in humans, Exchange of gases, Cellular respiration.

Chapter 5: Photosynthesis & Transportation in Plants

- Photosynthesis in Plants, Raw material required for Photosynthesis, Mechanism of Photosynthesis. Transportation in Plants – mechanism of water transportation, Transportation of minerals and food materials in plants.

Chapter 6: Circulation in animals

- Human circulatory system, Internal structure of heart, Blood vessels and blood transport, Cardiac cycle, Types of circulation, Lymphatic system, Evolution of transport system, Blood pressure, Blood clotting.

Chapter 7: Excretion

- Excretion in human beings, Excretory system, Formation of urine, Urine composition, Dialysis, Kidney transplantation, Accessory excretory organs in humans, Excretion in plants (Alkaloids, tannins, resins, gums, latex)

CHEMISTRY	$(\mathbf{15 \times 4 = 60M})$

Chapter 1: Chemical Equations & Reactions

- Modern Symbols of Elements, Chemical Formula, Chemical Equation, Molecular Mass and Mole Concept, Chemical Reactions- Chemical Combination, Decomposition, Displacement, Oxidation & Reduction Reactions.

Chapter 2: Acids, Bases and Salts

- Chemical Properties of Acids and Bases, What is Common in All Acids?, Do All Acids Have the Same Strength? Do all bases have the same strength? Acidic & Basic Salts, pH scale.

Chapter 3: Structure of Atoms

- Charged Particles in Matter, Atomic Theories (Daltons, Rutherford, Bohr). Distribution of Electrons in Shells, Electronic Configuration.

Chapter 4: Classification of elements

- Early Attempts at the Classification of Elements, Modern Periodic Table, Trends on the Basis of Modern Periodic Table

Chapter 5: Metallurgy

- Physical Properties of Metals and Non-Metals, Chemical Properties of Metals & Non-Metals, Occurrence of Metals, Extraction of Metals (Metallurgy)

Chapter 6: Carbon and its compounds

- Lewis Dot structure of elements (electron dot), Formation of Ionic & Covalent bond. Allotropes of Carbon, Catenation - Unique Property of Carbon, Saturated & Unsaturated carbon compounds. Isomerism-Chain, Branched & Ring. Petroleum (Mineral Oil), Some Compounds of Carbon Other Than Hydrocarbons, Nomenclature of Carbon Compounds, Chemical Properties of Carbon Compounds, Properties of Ethanoic Acid and Ethanol, Saponification (Basic Concepts).

Chapter 7: Atoms and molecules

- Symbols of Elements, Valencies, Atomicity, Molecular Mass, Molecular formulae (Criss-cross method), How big are the atoms and molecules?, Chemical Formulae.

PHYSICS	$(15 \times 4 = 60M)$

Chapter 1: Motion

- Distance and displacement, velocity, uniform and non-uniform motion along a straight line; acceleration, distance-time and velocity-time graphs for uniform motion and uniformly accelerated motion, elementary idea of uniform circular motion.

Chapter 2: Force and Laws of Motion

- Force and Motion, Newton's Laws of Motion, Action and Reaction forces, Inertia of a body, Inertia and mass, Momentum, Force and Acceleration.

Chapter 3: Gravitation

- Gravitation; Universal Law of Gravitation, Force of Gravitation of the Earth (gravity), Acceleration due to Gravity; Mass and Weight; Free fall.

Chapter 4: Work and Energy

- Work done by a Force, Energy, Power; Kinetic and Potential energy; Law of conservation of energy (excluding commercial unit of Energy), Transformation of Energy.

Chapter 5: Sound

- Nature of sound and its propagation in various media, speed of sound, range of hearing in humans, ultrasound, reflection of sound, echo.

Chapter 6: Light (Reflection and Refraction)

- Reflection of light by curved surfaces; Images formed by spherical mirrors, centre of curvature, principal axis, principal focus, focal length, mirror formula (Derivation not required),magnification. Refraction; Laws of refraction, refractive index. Refraction of light by spherical lens; Image formed by spherical lenses; Lens formula (Derivation not required); Magnification. Power of a lens. Applications of spherical mirrors and lenses.

Chapter 7: Human Eye and the Colourful World

- Structure & Functioning of a lens in human eye, defects of vision and their corrections, Refraction of light through a prism, dispersion of light, scattering of light, applications in daily life (excluding colour of the sun at sunrise and sunset).

Chapter 8: Electric Current

- Electric current, potential difference and electric current, Ohm's law; Resistance,Resistivity, Factors on which the resistance of a conductor depends. Series combination of resistors, parallel combination of resistors and its applications in daily life. Heating effect of electric current and its applications in daily life.

Chapter 9: Magnetic Effects of Current

- Magnetic field, field lines, field due to a current carrying conductor, field due to current carrying coil or solenoid; Force on current carrying conductor, Fleming's Left Hand Rule, Direct current. Alternating current: frequency of AC, Advantage of AC over DC, Domestic electric circuits, Applications of Magnetic Effects of Current.

ENGLISH	$(5 \times 4 = 20M)$

- Unseen Comprehension Passage

MENTAL ABILITY	$(15 \times 4 = 60M)$

Chapter 1: Mathematical Operations
Chapter 2: Blood relation
Chapter 3: Number series
Chapter 4: Direction sense
Chapter 5: Seating arrangement
Chapter 6: Puzzles
Chapter 7: Mirror and water images
Chapter 8: Cubes and Dice
Chapter 9: Ranking order
Chapter 10: Coding and Decoding

DEENIYAT	$(5 \times 4 = 20M)$

Chapter 1: Five Pillars of Islam & Months of Islam

Chapter 2: Books of Allah SWT (Prophets & their book names) The Quran (Parahs & Surahs)

Chapter 3: Prophets of Allah SWT (Names & their miracles)

Chapter 4: Family & Important Holy Companions (Names) of Prophet Muhammad PBUH

Chapter 5: Angels of Allah SWT (Names & their duties)

Chapter 6: Important milestones in Islamic History

SOCIAL SCIENCE	$(10 \times 4 = 40M)$

CIVICS

Chapter 1: Indian constitution

- Making of The Indian Constitution, Fundamental Rights

Chapter 2: Democracy

- What is Democracy? Features of Democracy, Why Democracy?

Chapter 3: Election Process in India

- Election Commission of India, Chief Election Commissioner
- The need for Electoral reforms, Political parties -National & State parties.

ECONOMICS

Chapter 4: Sectors of Indian Economy

- Sectors of Economic activities, Comparing the three sectors, Primary, Secondary and Tertiary sectors in India.
- Division of sectors: organized and unorganized, Sectors in terms of ownership: Public and Private sectors.

Chapter 5: Money and Credit

- Barter System, Reserve Bank of India & Self Help Groups, Modern forms of money, Loan activities of Banks.

Chapter 6: Globalization and the Indian Economy

- What is Globalization? Factors that have enabled Globalization, World Trade Organization, and Impact of Globalization in India, International Monetary Fund & MNCs.