

MILLAT TALENT SEARCH EXAMINATION (MTSE)

SYLLABUS FOR EXAMINATION SCHEDULED ON 24 DEC 2023 & 7 JAN 2024

| MATHEMATICS | | 20 marks |
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| CHAPTER NAME | SUB TOPICS | |
| 1. Real Numbers | <ul style="list-style-type: none">• Introduction, Fundamental Theorem of Arithmetic, Revisiting Irrational Numbers, Revisiting Rational Numbers and Their Decimal Expansion. | |
| 2. Polynomials | <ul style="list-style-type: none">• Introduction, Geometrical Meaning of the Zeroes of a Polynomial, Relationship between Zeroes and Coefficients of a Polynomial. | |
| 3. Pair of Linear Equations in Two Variables | <ul style="list-style-type: none">• 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. | |
| 4. Quadratic Equations | <ul style="list-style-type: none">• Introduction, Quadratic Equations, Solutions of a Quadratic Equation by Factorisation and by using quadratic formula, Nature of Roots. | |
| 5. Arithmetic Progression | <ul style="list-style-type: none">• Introduction, Arithmetic Progression, n^{th} Term of an AP, Sum of First n Terms of an AP. | |
| 6. Triangles | <ul style="list-style-type: none">• Introduction, Similar Figures, Similarity of Triangles, Criteria for Similarity of Triangles. | |
| 7. Coordinate Geometry | <ul style="list-style-type: none">• Introduction, Distance Formula, Section Formula. | |
| 8. Introduction to Trigonometry | <ul style="list-style-type: none">• Introduction, Trigonometric Ratios, Trigonometric Ratios of some Specific Angles ($0^\circ, 30^\circ, 45^\circ, 60^\circ, 90^\circ$), Trigonometric Identities. | |
| 9. Some Applications of Trigonometry | <ul style="list-style-type: none">• Introduction, simple problems on Heights and Distances. | |
| 10. Circles | <ul style="list-style-type: none">• Introduction, Tangent to a circle, Number of Tangents from a Point on a Circle. | |
| 11. Areas Related to Circles | <ul style="list-style-type: none">• Introduction, Perimeter and Area of a Circle – A Review, Areas of Sector and Segment of a Circle, Areas of combination of Plane Figures. | |

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| 12. Surface Areas and Volumes | <ul style="list-style-type: none"> • Introduction, surface Area of a Combination of Solids, Volume of a Combination of solids. |
| 13. Statistics | <ul style="list-style-type: none"> • Introduction, Mean of Grouped Data, Mode of Grouped Data, Median of Grouped data. |
| 14. Probability | <ul style="list-style-type: none"> • Introduction, classical definition of probability, simple problems on finding the probability of an event. |

BIOLOGY

10 marks

| CHAPTER NAME | SUB TOPICS |
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| 1. How do Organisms Reproduce | <ul style="list-style-type: none"> • 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 |
| 2. Control and coordination | <ul style="list-style-type: none"> • 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 |
| 3. Heredity and evolution | <ul style="list-style-type: none"> • Heredity, Mendel's Experiment, Sex determination, Evolution, Evidences for evolution, Lamarckism, Darwin's theory, Speciation, Human evolution, Chromosomal disorders |
| 4. Respiration – a life process | <ul style="list-style-type: none"> • 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 |
| 5. Photosynthesis & Transportation in Plants | <ul style="list-style-type: none"> • Photosynthesis in Plants, Raw material required for Photosynthesis, Mechanism of Photosynthesis. Transportation in Plants – mechanism of water transportation, Transportation of mineral and food materials in plants. |

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| 6. Circulation in animals | <ul style="list-style-type: none"> 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. |
| 7. Excretion | <ul style="list-style-type: none"> Excretion in human beings, Excretory system, Formation of urine, Urine composition, Dialysis, Kidney transplantation, Accessory excretory organs in humans, Excretion in plants (Alkaloids, tannin, resins, gums, latex) |
| CHEMISTRY 15 marks | |
| 1. Chemical Equations & Reactions | <ul style="list-style-type: none"> Modern Symbols of Elements, Chemical Formula, Chemical Equation Molecular Mass and Mole Concept, Chemical Reactions- Chemical combination, decomposition, displacement, oxidation & reduction reactions. |
| 2. Acids, Bases and Salts | <ul style="list-style-type: none"> 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. |
| 3. Structure of Atoms | <ul style="list-style-type: none"> Charged Particles in Matter, Atomic Theories (Dalton's, Rutherford, Bohr). Distribution of Electrons in shells, Electronic Configuration. |
| 4. Classification of elements | <ul style="list-style-type: none"> Early Attempts at the Classification of Elements, Modern Periodic Table, Trends on the Basis of Modern Periodic Table |
| 5. Metallurgy | <ul style="list-style-type: none"> Physical Properties of Metals and Non-Metals, Chemical Properties of Metals & Non-Metals, Occurrence of Metals, Extraction of Metals (Metallurgy) |
| 6. Carbon and its compounds | <ul style="list-style-type: none"> 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). |

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| 7. Atoms and molecules | <ul style="list-style-type: none"> • Symbols of Elements, Valencies, Atomicity, Molecular Mass, Molecular formulae (Criss- cross method), How Big Are the Atoms and Molecules? , Chemical Formulae |
| PHYSICS 15 marks | |
| 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. |
| 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. |
| 3. Gravitation | Gravitation; Universal Law of Gravitation, Force of Gravitation of the earth (gravity), Acceleration due to Gravity; Mass and Weight; Free fall. |
| 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. |
| 5. Sound | Nature of sound and its propagation in various media, speed of sound, range of hearing in humans; ultrasound; reflection of sound; echo. |
| 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. |
| 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). |
| 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 |

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| | daily life. Heating effect of electric current and its applications in daily life. Electric power, Interrelation between P, V, I and R. |
| 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. |

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| ENGLISH | 5 marks |
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| Unseen Comprehension Passage |
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| MENTAL ABILITY | 15 marks |
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| 1. Mathematical Operations | 6. Puzzles |
| 2. Blood relation | 7. Mirror and water images |
| 3. Number series | 8. Cubes and Dice |
| 4. Direction sense | 9. Ranking order |
| 5. Seating arrangement | 10. Missing numbers |

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| DEENIYAT | 10 marks |
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| 1. Five Pillars of Islam & Months of Islam | 4. Family & Important Holy Companions (Names) of Prophet Muhammad PBUH |
| 2. Books of Allah SWT (Prophets & Their book names) The Quran (Parahs & Surahs) | 5. Angels of Allah SWT (Names & their duties) |
| 3. Prophets of Allah SWT (Names & their miracles) | 6. Important milestones in Islamic History |

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| SOCIAL SCIENCE | 10 marks |
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| CIVICS |
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| 1. Indian constitution | Making of The Indian Constitution, Fundamental Rights |
| 2. Democracy | What is Democracy? Features of Democracy, Why Democracy? |

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| 3. Election Process in India | Election Commission of India, Chief Election Commissioner, The need for Electoral reforms, Political parties -National & State parties. |
| ECONOMICS | |
| 1.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. |
| 2.Money and Credit | Barter System, Reserve Bank of India & Self Help Groups. Modern forms of money. Loan activities of Banks. |
| 3.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. |