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SYLLABUS
MATHEMATICS

1. Number System:

Fundamental operations ($+, -, \times, \div$, squares, square roots, cubes, cuberoots) and properties of different number systems up to Real Numbers- properties of numbers like even, odd, prime, composite, co-prime, multiples, factors etc. - prime factorization, LCM and HCF of numbers- number patterns-progressions(arithmetic progression) – Playing with numbers(divisibility rules, number puzzles) – fractions and decimals and their conversions with and without division- laws of logarithms- Mathematical units and their conversions.

Sets and their representation – types of sets – operations on sets – Venn diagrams

2. Commercial Mathematics:

Ratio – inverse ratio, compound ratio - Proportion (direct and indirect) – unitary method – percentage – conversion from fraction, decimal to percentage and vice-versa- profit and loss- discount – Interest (simple and compound) – Time and distance – Time and work – Goods and Service Tax(GST)

3. Algebra:

Variables and constants, terms, expressions, degree – types of expressions (based on degree and terms)

Operations on Algebraic expressions-laws and properties of exponents – factorization– algebraic Identities- polynomials and their zeroes – remainder theorem and factor theorem – relationship between zeroes and coefficients of polynomials

Simple linear equations (in one variable and two variables) – pair of linear equations in two variables (conditions for consistent, inconsistent and dependent and their geometrical interpretations) and their solutions – Quadratic equations (nature of roots) and finding the roots and forming a quadratic equation when roots are given.

4. Geometry:

Basic geometric ideas (point, line, plane etc) – Angles (types of angles)

Lines and angles – pairs of angles (complementary, supplementary etc) vertically opposite angles, linear pair- parallel lines and a transversal, different angles formed and properties related to them

Types of triangles (based on sides and angles) and their properties-triangle inequalities – congruency and similarity of triangles and their criterion- basic proportionality theorem and converse-Pythagoras theorem and converse – areas of similar triangles

Different types of quadrilaterals (trapezium, parallelogram etc.) and their properties – mid-point theorem and its converse.

Parts of a circle – different angles formed by an arc (chord) – perimeter and area of a sector – segments of a circle – tangents and secants to a circle and their properties.

Cartesian system- plotting a point- distance between two points – section formula (mid-point, centriod etc) – area of triangle – collinearity-slope of a line

5. Mensuration

Perimeter and area of plane figures (triangle, circle etc) – surface areas and volumes of different solid figures (cube, cylinder, etc)

6. Trigonometry

Trigonometric ratios – values for specific angles ($0°, 30°, 45°, 60°, 90°$) - complementary angles – trigonometric identities – angle of elevation and depression and simple problems related to them.

7. Data Handling

Collection, classification and types of data – tabular forms – graphical representation of data (pictogram, bar graph etc) – reading and interpretation of data from graphs – mean, median and mode of ungrouped data – simple problems related to probability (dice, coins, deck of cards etc)-concept of complementary events.

1. Material

Transparent, translucent, opaque material. .

Characteristics of Solids, Liquids, Gases - sink & float - Soluble in water.
Methods of separation (Hand packing, Winnowing, Sedimentation, Sewing, Filtration, Crystallization, Evaporation, Sublimation, Chromatography).

Characteristics of acids, bases – Change in colour of litmus (Red, Blue) –examples for acids & bases in daily life – Acid rains , impact, remedies - Neutralization -uses of acids, bases in daily life – Acidic and basic nature of salts - uses of salts.

Natural fiber, Synthetic fiber - Burning test - Blending – Laundry label symbols – plastic resin codes – Thermoplastics, Thermosetting plastics – Reduce, Recycle, Reuse, Recover.

General Physical Properties of Metals and non metals – Uses of metals and non-metals in daily life.

Archimedes principle – Pascal's principle and uses.

2. Light

Formation of shadow – Characteristics of shadow – straight line motion of light, pinhole camera – differences between shadow and images.

Reflection of light - Laws of reflection – Plane of reflection - Periscope – concave and convex mirrors - making of solar cooker.

Refraction of light - total internal reflection, applications - mirages – types of lenses- uses of convex and concave lenses in daily life.

Least distance of distinct vision – Angle of vision – Accommodation defects of human eye (Myopia, Hypermetropia, presbyopia) and their corrections – power of lens. Dispersion and formation of rainbow, Scattering & Blue colour of the sky, Red colour of Sun at the time of dawn & dusk.

3. Electricity & Magnetism

Types of magnets – like, unlike poles.
Simple electric circuit – symbols of components of circuit - torch.

Conductors,Insulators – parts of dry cell – series & parallel connections of dry cells and bulbs.

Electric conductivity of liquids - Electroplating, uses of it.

Heating effects of electric current – Fuse & MCB – electricity bill & unit - electricshock, precautions.

Difference between motor & generator – difference between AC and DC.

4. Heat

Heat is a form of energy – Heat and temperature – Thermometer (clinical thermometer, laboratory thermometer).

Evaporation, factors affecting evaporation – condensation – Humidity – Dew & Fog – Boiling, Melting, Freezing – Enormous expansion of water.

5. Sound

Production of Sound – Propagation of sound in solids, liquids, gases, & vacuum - Structure of human ear.

Types of waves(transverse, Longitudinal) – wave length, Amplitude, Loud and feeble sounds – Time period, Frequency, pitch – speed of sound wave in solids, liquids, gases.

Reflection of sound – Echo - Reverberation. Audible Range –Infrasonic sounds, Ultrasonic sounds, Uses of Ultrasonicsounds.

Sound Pollution, effects, measures to be taken to control sound pollution.

6. Motion

Uniform, Non-uniform motion –Translatory motion (Rectilinear motion, Curvilinear motion), Rotatory motion, Oscillatory motion.

Field forces (Magnetic force, Electrostatic force, Gravitational force) – Contact forces (Muscular force, Friction, Normal force, Tension) - Net Force, Free body diagram. Effects of force.

Factors affecting friction – Measures to be taken to increase friction, measures to be taken to decrease friction.

Potential energy, Kinetic energy. Renewable & Non-renewable energy resources.

Finding centre of gravity.

Equations of Uniform accelerated motion.

Daily life examples of Newton's Laws of Motion (1,2,3).

7. Changes

Change in seasons – Natural, man made changes – Permanent, temporary changes – Change in state & shape of material – Reasons for change – Indications of change – Physical Change, Chemical Change.

Rusting of Iron / Corrosion, Galvanization - Browning of Cut vegetables & its prevention – Crystallization.

8. Weather & Climate

Measuring the components of weather –Maximum-Minimum thermometer – Rain Gauge – Humidity.

Air exerts pressure – Air expands on heating – effects of moving air- formation of Cyclone - Do's and Dont's during Cyclones – Post cyclone measures.

9. Coal & Petrol

Uses of coal, petroleum, natural gas - Byproducts of petroleum, uses.
Formation ofcoal, petroleum – Indiscriminate usage of energy resources , its effects.

Combustion - Ignition temperature – fuel, Calorific Value. Fire Control. Structure of Flame , Zonesin it.

10. Some Natural Phenomena

Producing charge on an object – identifying charge on an object – measures to be taken during thunder – lightening conductor – earth quakes, causes, protection – seismograph – Richter scale

11. Stars & Solar System

Sundial – phases of moon - Types of solar and lunar eclipses –constellations – Pole star – Solar system(Planets, Asteroids,Comets, Meteors).

12. Metallurgy

Minerals, ores, Reactivity series of Metals.

13. Chemical Reactions

Elements – Compounds – Mixtures -Types of Mixtures (Homogeneous, Heterogeneous) – Solutions – Solvent, Solute.

Types of   chemical reactions (chemical combination, chemical decomposition, chemical displacement, chemical double displacement / double decomposition).

Biological Science

1. Food

Food from plants and animals –methods of preparing food- food preservation methods- food components- Carbohydrates- Proteins – Fats – Vitamins – balanced diet- malnutrition – deficiency diseases- Food capture in organisms - food habits in animals.

2. Living Organisms

Prokaryotic and eukaryotic cell - Plant cell and animal cell- cell structure and functions- plant and animal tissues. Plant parts and functions - fibre from plants.

Characteristics of living organism- parts helps in movement of human beings and animals - characteristics of different animal Phyla - metamorphosis in organisms- sense organs.

Useful and harmful micro organisms - infectious and non - infectious diseases.

3. Life Processes

Human digestive system- Human respiratory system – Human circulatory system – Human Excretory system – Human nervous system - Human Endocrine system - Human reproductive system - cell cycle - mitosis - meiosis - sex determination in human being – Physical and behavioral changes in adolescence - reproductive health.

Photosynthesis

Flower parts - vegetative propagation-seed dispersal.

4. Biodiversity

Types of ecosystems –Terrestrial ecosystems and aquatic ecosystems-adaptations in plants and animals living in different ecosystems – food chain – food web – endemic – endangered and extinct species – sanctuaries and National parks.

Cultivation – irrigation – fertilization – challenges in improving agricultural products.

5. Pollution

Sources and effects of air, water, soil and sound pollution.
4 Rs-Reduce, Reuse, Recycle, Recover.

SOCIAL STUDIES

1. Geography

Our Earth: Evolution, Latitudes and Longitudes, Movements of the Earth and Seasons, Relief Features of India, Reading and Making Maps, Water Resources – Rivers and Tanks, Climate and Weather: Factors affecting the Climate and Weather, Natural Realms of the Earth: Lithosphere, Atmosphere, Hydrosphere, Biosphere, Natural Vegetation, Population, Settlements and Migration

2. History

Indus Valley Civilization, Emergence of Kingdoms: Mahajanapadas, First Empires: Mauryan Empire, Emergence of Regional Kingdoms – Kakatiyas and Vijayanagara Kingdoms, Mughal Empire, Establishment of British Empire in India, Freedom Movement of India, Democratic and Nationalist Revolutions, Industrial Revolution, Colonialism in Latin America, Asia and Africa, Social Protest Movements : Environmental Movements, Women's Movements, World Between World Wars, Post World Wars – League of Nations, UNO, NAM, Cold War, The Movement for the formation of Telangana State

3. Political Science

Indian Constitution- Salient Features, Forms of Government – Presidential and Parliamentary forms of Government, Government at Different Levels- Union, State, Local Self Government, Judicial System in India: Civil Law, Criminal Law, Courts at different levels, Democracy : An Evolving Ideas; Expansion of Democracy-Libya, Myanmar, Election Process in India, Rights: Human Rights and Fundamentals Rights, Disaster Management, Social Issues: Communalism, Corruption, Poverty, Independent India: 1947-1977, Emerging Political Trends- 1977-2000, Women Protection Acts-Child Rights, Traffic Education.

4. Economics

Money and Banking, Sectors of Economy: Agricultural, Industries, Service, Credit in Financial System, Prices and Cost of Living, The Government Budget and Taxation, Food Security, Factors of Production, Globalization, Sustainable Development, Gross Domestic Product; National Income /Per capita Income

TEACHING APTITUDE

Aptitude questions will be related to understanding teaching-learning process, classroom management and mentoring with special reference to teacher-pupil relationship.

Teaching requires certain characteristics like ability to communicate, ability to deal with Children, ability to recognize individual differences etc., apart from analytical thinking and general intelligence. One who has these characteristics will be able to become a good teacher after training. Questions relating to these aspects will be included to test one's teaching aptitude.

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GENERAL ENGLISH

Reading comprehension, spelling errors, vocabulary, phrase replacement, error detection and word association.

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GENERAL KNOWLEDGE & EDUCATIONAL ISSUES

Current affairs (India and International), Contemporary Educational Issues.

1. Questions will be designed to test the ability of the candidate's general knowledge of the environment around him and its application to society.

2. Questions will also be designed to test knowledge of current events and of such matters of every day observation and experience in their scientific outlook as is expected of an educated person.

3. The test will also include questions relating to India and its neighbouring Countries especially pertaining to History, Culture, Geography, Ecology, Economics, General Policy and Scientific Research.

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COMPUTER AWARENESS

Computer - Internet, Memory, Networking, Fundamentals of computers and Antivirus.