TEACHER ELIGIBILITY TEST – 2018
PAPER-II(A) MATHSMETICS & SCIENCE SYLLABUS

PART -A

CHILD DEVELOPMENT AND PEDAGOGY (Marks: 30)

1. DEVELOPMENT OF CHILD

- Development, Growth & Maturation — Concept & Nature
- Principles of development and their education implication
- Factors influencing Development — Biological, Psychological, Sociological, emotional.
- Understanding Development — Piaget, Kohlberg, Chomsky, Carl Rogers, Erikson
- Individual differences — Infra & Inter Individual differences in the areas of Attitudes, Aptitude, Interest, Habits, Intelligence and their Assessment.
- Development of Personality — Concept, Factors effecting development of personality, self concept.
- Adjustment, Behavioural problems, Mental Health, Defense mechanism.
- Methods and Approaches of Child Development — Introspection, Observation, Interview, Case study, Experimental, Cross sectional and Longitudinal
- Developmental tasks and Hazards

2. UNDERSTANDING LEARNING

- Concept, Nature of Learning — input — process — outcome
- Factors of Learning — Personal and Environmental
- Approaches to Learning and their applicability—Behaviorism (Skinner, Pavlov, Thorndike) Constructivism (Piaget, Vygotsky), Gestalt(Kohler, Koffka) and Observational (Bandura)
- Dimensions of Learning — Cognitive, Affective and Performance.
- Motivation and Sustenance —its role in learning.
- Memory & Forgetting
- Transfer of Learning

3. PEDAGOGICAL CONCERNS

- Teaching and its relationship with learning and learner.
- Learners in Contexts: Situating learner in the socio-political and cultural context
- Children from diverse contexts—Children With Special Needs (CWSN), Inclusive Education.
- Understanding of pedagogic methods — Enquiry based learning, Project based learning, Survey, Observation and Activity based learning, Cooperative and collaborative learning.
- Individual and Group learning: Issues and concerns with respect to organizing learning in class room like Study habits, Self learning and Learning to learn skills.
- Organizing learning in heterogeneous class room groups — Socio-economic background, Abilities and Interest.
- Paradigms of organizing Learning-Teacher centric, Subject centric and Learner centric.
- Theory of instruction – Bruner
- Teaching as Planned activity — Elements of Planning
- Phases of Teaching — Pre active, Interactive and Post active
- General and Subject related skills, competencies required in teaching and attributes of good facilitator.
- Learning resources — Self, Home, School, Community, Technology.
- Distinction between Assessment for Learning & Assessment of Learning, School based Assessment, Continuous & Comprehensive Evaluation : Perspective & Practice.
ఎంగు (30 విషయాలు)

1) విశేషాలు:
   1) వాస్తవిక పదార్ధం / వాస్తవిక వాస్తవం

2) 6వ విషయం నుండి 10వ విషయం వరకు తినబడిన విషయాలు:
   1) తొంద్రికత రెండు - అవసరం
   2) తొందరు - తొందరు తినిన వాస్తవం
   3) సమాధానం
   4) అంతకం
   5) విశేషాలు

3) ఎంపూ (6 విషయం 10వ విషయం వరకు ఎంపూ):
   1) అంకాలు
   2) లక్షణాలు
   3) అంకాలు
   4) మామిడి
   5) మామిడి

4) గురించినం:
   1) పిల్లలు మహాన్
       (పిల్లలం, పిల్లలం, పిల్లలం, పిల్లలం, పిల్లలం, పిల్లలం, పిల్లలం, పిల్లలం, పిల్లలం, పిల్లలం, పిల్లలం, పిల్లలం, పిల్లలం, పిల్లలం, పిల్లలం, పిల్లలం, పిల్లలం)
   2) తలాలు - పుట్టలు
       తలాలు - తలాలు, తలాలు, తలాలు, తలాలు, తలాలు, తలాలు, తలాలు, తలాలు, తలాలు, తలాలు, తలాలు, తలాలు, తలాలు, తలాలు, తలాలు, తలాలు, తలాలు, తలాలు, తలాలు, తలాలు, తలాలు
   3) తొందరు - పుట్టలు
   4) ప్రతికర్త - ప్రతికర్త (ప్రతికర్త, ప్రతికర్త, ప్రతికర్త, ప్రతికర్త, ప్రతికర్త).
   5) ప్రతికర్త (ప్రతికర్త, ప్రతికర్త, ప్రతికర్త, ప్రతికర్త, ప్రతికర్త, ప్రతికర్త, ప్రతికర్త, ప్రతికర్త, ప్రతికర్త, ప్రతికర్త, ప్రతికర్త, ప్రతికర్త, ప్రతికర్త, ప్రతికర్త, ప్రతికర్త, ప్రతికర్త, ప్రతికర్త, ప్రతికర్త, ప్రతికర్త, ప్రతికర్త, ప్రతికర్త)
پہلی سطح: کلیم 1) ایک دوکھا نظر
2) ایک بینی کلم

دوسرا سطح: ایک بینک کی تدریس کئی
 (A) امتحان اور تحریمیات
 (B) شجراء و ایدا کا تحریر
 (C) سواجح جاہیت اور اولی کارکردگی

تیسرا سطح: (صرف کتاب میں موجود مواد)
 (A) صحیح
 (B) مزید معلومات
 (C) دوستی
 (D) اشکاد
 (E) جہاد
 (F) ذکر و سووہ

چهارواں سطح:
 (A) ہیں
 (B) امام عام اور اسمعیل کی سمت
 (C) نہیں
 (D) مفت اور اس کے اشام
 (E) رذلف، کافی
 (F) سب سے اور سبھی
 (G) تحریف شخص اور تحریف قرآن
 (H) فصل، پانی، مشوق
 (I) واپس ادائیہ
Hindi: Content (30 Marks)

1. अवबोधः: पठित - अपठित - पद्ध - गद्य।
2. कवि - काव्य - रचनाकार (लेखक) रचनाएँ
3. वर्णमाला: र्वर, व्यंजन, भेद।
   शब्दभेदः रूप, परिवर्तन के आधार पर विकरी और अविकरी शब्द।
   वचन,लिंग, कारक काल, विराम विहन संधि, समास, विलोम शब्द, समान अर्थ,
   भिन्नार्थ, मुहावरे, कहावतें, लोकोपन्ने।
4. अकर्मक - सकर्मक क्रियाएँ, वाक्य-वाक्य भेद - कन्यवाच्य, कर्मवाच्य भाववाच्य,
   वाक्य और प्रयोग, वाक्य क्रम, घटना क्रम।
5. भारतीय काव्य शास्त्र - काव्य लक्षण, रस, छंद, अलंकार।
6. हिंदी पाद्य पुस्तकें (मृत्यु भाषा) छटबीं से दसबीं कक्षा तक (उपवाचक और
   पठनहेतु सहित)
Kannada: Content (30 Marks)

1. ಸಂಸ್ಕೃತ ಕನ್ನಡ
2. ಸಂಸ್ಕೃತ ಕನ್ನಡ

3. ಹೊಸ್ತು 10 ಸಂತಾನಿಗಳು ಹೊಸ್ತು ಸಂತಾನಿಗಳನ್ನು. ಸಂತಾನ ಸಂಸ್ಕೃತಿಯನ್ನು ಮಾತನಾಡಿಸಿ.

4. ಸಂಸ್ಕೃತ ಕನ್ನಡ,
5. ಸಂಸ್ಕೃತ ಕನ್ನಡ,
6. ಸಂಸ್ಕೃತ ಕನ್ನಡ,
7. ಸಂಸ್ಕೃತ ಕನ್ನಡ
Tamil: Content (30 Marks)

I. immutable - immutable
   a) immutable  b) immutable

II. 6 メーも 20 енная 10 メーも 期末 20 ernity 20 ernity

III. நூற்றாண்டை:  
   குறிப்பிட்டு, புத்தாண்டு குறிப்பிட்டு  
   குறிப்பிட்டு  

Oriya: Content (30 Marks)

1. తండ్రి తండ్రి: -  
   a) దిగువడు తండ్రి  b) చిన్ని తండ్రి  

2. తెలుగు తండ్రి తండ్రి తండ్రి: -  
   a) తండ్రీ తండ్రి తండ్రి  b) చిన్ని తండ్రి తండ్రి  
   c) తండ్రీ తండ్రి తండ్రి  

3. తండ్రి తండ్రి: -  
   a) తండ్రి తండ్రి  b) తండ్రి తండ్రి  c) తండ్రి తండ్రి  
   d) తండ్రి తండ్రి  e) తండ్రి తండ్రి  f) తండ్రి తండ్రి  
   g) తండ్రి తండ్రి  h) తండ్రి తండ్రి  i) తండ్రి తండ్రి  

4. తండ్రి తండ్రి: -  
   a) తండ్రి, తండ్రి, తండ్రి, తండ్రి తండ్రి  
   b) తండ్రి తండ్రి - తండ్రి, తండ్రి, తండ్రి, తండ్రి తండ్రి  
   c) తండ్రి - తండ్రి, తండ్రి, తండ్రి, తండ్రి  
   d) తండ్రి - తండ్రి, తండ్రి, తండ్రి, తండ్రి  
   e) తండ్రి - తండ్రి, తండ్రి, తండ్రి, తండ్రి  
   f) తండ్రి - తండ్రి, తండ్రి, తండ్రి, తండ్రి  
   g) తండ్రి - తండ్రి, తండ్రి, తండ్రి, తండ్రి, తండ్రి, తండ్రి, తండ్రి, తండ్రి, తండ్రి, తండ్రి, తండ్రి, తండ్రి, తండ్రి, తండ్రి
Sanskrit: Content (30 Marks)

1. पठनावगमनम्: परिचितश्लोकः - प्रश्नः  
2. कवयः: काव्यम् - रचनातारः - रचना: 
3. पाठ्यप्रक्रिया: पद्य - गद्य - चन्द्रो - दण्डक - शतक - आत्मकथा - हृद्यादयः 
4. पाठ्यांशाध्यायितप्रश्नः: 
5. भाषाः: समानार्थक 
   विरुध्धार्थक 
   संधि 
   समास 
   छन्दः 
   अलखारः 
   विभक्ति 

English: (Content & Methodology) (Marks: 30)

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<td>Antonyms</td>
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<td>Homophones</td>
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<tr>
<td>Homonyms</td>
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<td>Hypernyms and Hyponyms</td>
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<td>Spelling</td>
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<td>Identification of Meaning</td>
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<td>Word Formation</td>
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<td>Short forms and Full forms</td>
<td>Commonly used short forms and full forms in English</td>
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<tr>
<td>Abbreviations and Full forms</td>
<td>Commonly used Abbreviations and their full forms</td>
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<th>GRAMMAR</th>
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<td>Helping Verbs</td>
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<td>Modal Auxiliaries</td>
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<td>Simple Prepositions Including Prepositions following Certain Words</td>
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<td>Topic</td>
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<td>Clauses</td>
<td>Main Clauses, sub-ordinate Clauses, Noun Clauses, If Clauses, Relative Clauses</td>
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<td>Sentence Structures</td>
<td>Basic Sentence Structures</td>
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<td>Degrees of Comparison</td>
<td>Form, Function, Construction, Transformation</td>
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<td>Language Functions</td>
<td>Language Functions with social norms (Formal and Informal)</td>
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<td>Question Tags</td>
<td>Imperatives and Statements</td>
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<td>Types of Sentences</td>
<td>Types of Sentences</td>
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<td>Direct Speech &amp; Indirect Speech</td>
<td>Statements, Questions, Imperatives</td>
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<td>Active Voice &amp; Passive Voice</td>
<td>Active Voice &amp; Passive Voice</td>
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<tr>
<td>Tenses</td>
<td>Use of tenses and framing including IF conditionals Type 1 &amp; 3</td>
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<tr>
<td>Agreement between subject &amp; Verb</td>
<td>Agreement between Subject &amp; Verb</td>
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<tr>
<td>Word Order</td>
<td>Word Order in a phrase or a sentence</td>
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<tr>
<td>Parts of Speech</td>
<td>Nouns, Pronouns, Adjectives, Adverbs, Conjunctions - Types and functions</td>
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<td>Linkers</td>
<td>Linkers</td>
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<td>Transformation of Sentences</td>
<td>Simple, Compound and Complex Sentences</td>
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<td>Common Errors</td>
<td>Based on all Vocabulary and Grammar Topics</td>
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<td>MECHANICS OF WRITING</td>
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<td>Punctuation and Capitalization</td>
<td>Use of capital letters, comma, full stop, question mark, exclamation mark and inverted commas</td>
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<td>DISCOURSES</td>
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<td>Letter Writing and News Report</td>
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<td>DICTIONARY SKILLS</td>
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<td>DICTIONARY SKILLS</td>
<td>DICTIONARY SKILLS</td>
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<td>READING COMPREHENSION</td>
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<td>Prose</td>
<td>Prose (general)</td>
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PART - B

Mathematics Content (24Marks)

I. Arithmetic
Ratio and Proportion - Applications of Ratio- Comparing Quantities using proportion -Direct and Inverse proportion

II. Number System

Real numbers -Representing irrational numbers on Number line – representing real numbers on the number line through successive magnification – rationalisation –Real numbers- operations on real numbers- law of exponents for real numbers- surds( exponential form & radical form )

Euclid’s division lemma & its application in finding HCF – fundamental theorem of Arithmetic & its application (HCF & LCM, decimal representation of rational numbers (terminating or non-terminating recurring and vice versa))

Non-terminating & non recurring decimals as irrationals – irrationality of \(\sqrt{2}, \sqrt{3}\) etc.- properties of irrational numbers

Logarithm -Logarithm-exponential & logarithmic forms-Properties & Laws of logarithms- standard base of logarithm- use of logarithms in daily life situation-

Sets –& its representation (Roster form & set builder form)-examples- classification of sets(empty, finite, infinite, subset & super set, universal set, disjoint sets, power set of a set, equality of sets)

Venn diagram – operations on sets ( union, intersection, difference, cardinal number of a set

III. Geometry
Measures of Lines and Angles - Symmetry - Understanding 3D, 2D Shapes -Representing 3D in 2D-Lines and Angles -Triangle and Its Properties -Congruency of Triangles -Quadrilaterals - Practical Geometry -Construction of Triangles Construction of Quadrilaterals - Exploring Geometrical Figures-

The Elements of Geometry - Area – Circles

Similar Triangles & Tangents and secants to a circle

Proofs in Mathematics

IV. Mensuration
Perimeter and Area - Area of Plane Figures -Surface areas and Volumes

V. Algebra
Introduction to Algebra- Simple Equations- Exponents - Algebraic Expressions

- Exponents & Powers - Linear Equations in one variable – Factorisation

VI. Statistics

VII. Probability
Probability - Random experiment and outcomes -Equally likely outcomes - Trail and Events - Linking the chance to Probability - uses of probability in real life
Probability-a theoretical approach – probability & modeling – equally likely events -mutually exclusive events –finding probability – elementary event –exhaustive events - complementary events & probability – impossible & certain events – deck of cards & Probability –use & applications of probability -

VIII. Coordinate Geometry
Cartesian system-Plotting a point in a plane if its co-ordinates are given.
Distance between two points - Section formula (internal division of a line segment in the ratio m : n) – centroid of a triangle – trisectional points of a line segment -Area of triangle on coordinate plane- collinearity –straight lines -Slope of a line joining two points

IX. Trigonometry
Trigonometry - Naming the side in a right triangle-trigonometric ratios – defining trigonometric ratios –trigonometric ratios of some specific angles (45°, 30° &60°, 0° &90°) –trigonometric ratios of complementary angles – trigonometric identities –
Applications of Trigonometry - Line of sight & horizontal -Angle of elevation & depression - Drawing figures to solve problems – solution for two triangles

Methodology (06 Marks)
3. Aims and Values of teaching Mathematics, Instructional objectives (Blooms taxonomy)
6. Unit Plan, Year Plan, Lesson Planning in Mathematics.
7. Instructional materials, Edgar Dale's Cone of Experience.
8. Evolving strategies for the gifted students and slow learners,
10. Mathematics club, Mathematics structure, Mathematics order and pattern sequence.
Physical Science:

CONTENT (Marks: 12)

1. Measurement:
   - Measurement of length, area, volume and time. CGS and SI units of length, area, volume and time. Conversion of units from CGS to SI and Vice versa.

2. Motion:
   - Motion and Rest, Types of motion (Translatory, Rotatory and oscillatory), Scalars and vectors distance, displacement, speed, velocity, Average speed, average velocity, Uniform motion, equations of uniform accelerated motion

3. Force and Friction:
   - Types of forces (field force and contact force), Net force (free body diagrams), Effects of net force, Pressure, types of friction (static, Sliding and Rolling), Factors affecting Friction (Roughness, normal force, area etc), Methods of reducing friction, Fluid friction

4. Newton’s law of motion:

5. Gravitation:
   - Uniform circular motion (centripetal acceleration and centripetal force), Universal law of gravitation, acceleration due to gravity (g) (direction of g), factors affecting (g), weight), Changes during free fall, Centre of gravity and stability

6. Floating bodies:
   - Density and relative density, Lactometer, Upward forces of liquids, Atmospheric pressure, its measurement, Pressure of liquids at different depths, Archomedes principle, its application, Pascal’s principle, its applications.

7. Work, Energy:
   - Work (Scientific meaning, formula, positive, negative and zero work conditions etc), Types of mechanical energy (Potential energy and kinetic energy), Numerical expressions and examples of mechanical energy, Conservation of mechanical energy, Energy inside human body

8. Sound:
   - Sound - a form of energy, Production of sound, Structure of larynx and voice box, Structure and functioning of eardrum, Propagation of sound, Types of waves (longitudinal and transverse), Characteristics of sound waves (Wavelength, attitude, frequency and speed), Relation between frequency and time period, Characteristics of musical sound (pitch, loudness and quality), Audible range of frequencies. Reflection of sound, echo and reverberation. Uses of multiple reflection of sound ( mega phone, horn, stethoscope, Designing of concert halls and Cinema halls), Applications of ultra sound (Industrial and medical applications), Sonar, working, Sound pollution (Measures, effects and control).

9. Heat:
   - Heat and temperature, Units of temperature (centigrade, Fahrenheit and Kelvin, conversion from, centigrade to Fahrenheit and Vice versa conversion from centigrade to Kelvin and Vice versa), Expansion of liquids due to heat, Types of thermometers (meruny, alcohol, clinical, six maximum, minimum, thermometers), Temperature and Kinetic energy relation, Specific heat (formula, units,
experiment and applications), Problems on method of mixtures. Evaporation and condensation, Boiling, Melting and freezing, Latent heat, Temperature time graph

10. Light:

Light, Shadows and Images, Reflection of light by plane surfaces (laws of reflection, periscope, multiple images, kaleidoscope, characteristics of image formed by plant mirrors), Reflection of light by curved surfaces (Virtual images, real images, Ray diagram for concave and curved mirrors, formula of curved mirrors regarding focal length and magnification application of spherical mirrors. Refraction of light at plane surface (condition of Refraction, Refractive Index, Relative Refractive Index, factors as which refractive Index of Medium depend comparison between linear and optical density, Snell’s law, Total Internal Reflection and its applications, Refraction through Glass slab, vertical and lateral shifts), Refraction through Curved Surfaces (When light enters into medium of Refractive Index ‘n₂’ from ‘n₁’ at curved surface with radius of curvature ‘R’, Len’s formula, (Len’s makers formula, Different types of lenses and ray diagrams regarding concave and convex lenses), Human eye and colourful world. (Human eye, its structure and optical measurements, eye defects, Myopia, hypermetropia, presbyopia and their corrections, Dispersion of light through prism. i-d curve, Rainbow, Scattering of light, and colour of sky)

11. Electricity:

Simple electric circuits, Conductors, Insulators, Type of cells (Dry and liquid), Electric symbols and uses, Series of parallel connection of cells and Bulbs, Heating effects of Electricity, Understanding of CFL, Fuse and MCBs, Electric current, potential difference and EMF, Drift velocity and working of a cell, Ohm’s law (Circuit, graph (I-V graph limitations and applications), Factors affecting Resistance of a material (Temperature, Material, length and Area of Cross section), Resistivity, series of parallel connections of resistances. Kirchhoff’s laws (Junction law of loop law) Electric power (Calculation of House hold electricity and rating of Electric appliances)

12. Electro-Magnetism:

Types of Magnets, Properties of Magnets, Magnetic compass, Earth as a Magnet, Magnetic Induction, Oirsted’s experiment, Magnetic Field, Magnetic field due to currents (straight, circular coil, electric motor), Electromagnetic Induction (Faradays’ law of Induction and its applications, magneto motive force and electric Generator, Lenz law)

13. Some Natural Phenomenon:

Electric charge, and Basic properties of electric charge, Types of charges and their interactions. Transfer of change, lighting, lighting safety, lighting conductors. Earthquake, Tsunami, Causes and effects, Protective measures.

14. Stars and solar system:

Movement of the sun, Phases of Moon, Eclipses (Solar and lunar eclipses) types of Eclipses Movement of Stars (Constellation, pole star, Solar System, Artificial Satellites.

15. Separation of Substances:

Mixtures, Methods of separation – handpicking winnowing. Sedimentation, decantation, Sieving, Filtration sublimation, chromatography, Distillation and fractional distillation.

16. Changes around us:

Slow/fast changes, Temporary/permanent changes, Natural/man made changes, Physical/chemical changes, Galvanization and corrosion, Rancidity, Oxidation / reduction

17. Matter:

States of matter, Properties of solids, liquids and gases, Effects of Temperature, pressure surface area and Humidity on change of states of matter. Homogeneous mixtures Heterogeneous mixtures. Solutions – Types of Solutions – Concentration of solution. Expressing Concentration of Solutions, Suspension – Colloids, Separation of mixtures by sublimation evaporation and
distillation. Separation of immiscible liquids. Understanding the nature of elements, Compounds and mixtures.

18. Metals and Non metals:
Physical properties of metals, Chemical properties of metals, Metal – non metal classification Reactivity of metals, Uses of metals, Minerals – ore, Occurrence of metals in nature, Examples of metals and non metal, Reactivity order of metals

19. Synthetic fibers and Plastics:

20. Coal and petroleum:

21. Combustion fuels and flame:

22. Water:
Process of water filtration, Types of impurities, Deceases caused by impure water, Acid rain particular pollutants, Water pollution, Strategies to control water pollution.

23. Acids, Bases and Salts:
Indicators – Natural indicator, Acidic substances and Basic Substances, Neutral substances and Salt, Neutralization, Chemical properties of acids and Bases, Reaction of Metal oxides with base/ Reaction of non metals with acids. Electrical conductivity of acids and bases, Strength of acids and bases, Concentration acids and bases, pH Scale Importance of pH in everyday life., pH of salts, Bleaching powder, washing soda and baking soda and their uses. Plaster of Paris.

Methodology: (03 Marks)
1. Definition, Nature, Structure and History of Science
2. Aims, Values , Instructional Objectives of teaching Science and Academic Standards in Science
3. Methods of Teaching Science
4. Teaching Learning Material in Teaching of Science - TLM in Science – Use of ICT.
5. Instructional Planning
6. Science Laboratory
7. Science Teacher - Changing Roles
10. Evaluation - CCE - Formative Assessment, Summative Assessment - Designing and Administration- Analysis of Scholastic Achievement Test (SAT)
Biological Science

CONTENT (Marks: 12)

1. **Living world:** What is Science, Living and None living thing. Diversity in living organisms, Cell the basic unit of life, Cell its structure and factions, plant tissues, Animal tissues, Cell division, Plasma membrane, Habitat, Animal behavior, Movements in animals, Story of micro organisms, Fiber to Fabric, Production of food from plants and animals, Challenges in improving agricultural products, Challenges in improving in Agricultural product. Why do we fall ill.


**Methodology: (3 Marks)**

1. Definition, Nature, Structure and History of Biological Science
2. Aims, Values , Instructional Objectives of teaching Science and Academic Standards in Science
3. Methods of Teaching Science
4. Teaching Learning Material in Teaching of Science - TLM in Science – Use of ICT.
5. Instructional Planning
6. Science Laboratory
7. Science Teacher - Changing Roles
10. Evaluation - CCE - Formative Assessment, Summative Assessment - Designing and Administration- Analysis of Scholastic Achievement Test (SAT)