TEACHER ELIGIBILITY TEST – 2018
PAPER-II(A) MATHSMETICS & SCIENCE SYLLABUS
<u>PART -A</u>

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.
- Dimensions of Development and their interrelationships — Physical & Motor, Cognitive, Emotional, Social, Moral, Language relating to Infancy, early Childhood, late Child hood, dolescence.
- 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.
- Class room Management: Role of student, teacher, Leadership style of teacher, Creation of non threatening learning environment, Managing behaviour problems, Guidance & Counselling, Punishment and its legal implications, Rights of a child, Time Management.
- Distinction between Assessment for Learning & Assessment of Learning, School based Assessment, Continuous & Comprehensive Evaluation : Perspective & Practice.
- Understanding teaching & learning in the context of NCF, 2005 & Right to Education Act, 2009.

తెలుగు (30 మార్కులు)

1) పఠనావగాహన:

   ఎ) అపరిచిత పద్యం / అపరిచిత గద్యం

2) 6వ తరగతి నుండి 10వ తరగతి వరకూ తెలుగు వాచకాలు:

   ఎ) ప్రక్రియలు – లక్షణాలు

   బి) కవులు – రచయితల పరిచయం

   సి) శేషాంశాలు

   డి) ఇతి వృత్తాలు

   ఇ) నేపధ్యాలు

3) పదజాలం:- (6 నుండి 10వ తరగతి స్థాయి వరకు)

   ఎ) అర్థాలు

   బి) పర్యాయపదాలు

   సి) నానార్థాలు

   డి) వ్యుత్పత్త్యర్థాలు

   ఇ) ప్రకృతి – వికృతులు

   డి) జాతీయాలు

   ఎఫ్) సామెతలు

4) భాషాంశాలు:

   ఎ) పారిభాషిక పదాలు

   (తత్సమ, తద్భవ, ఆగమ, ఆదేశాలు, కళలు, నిత్యం, విల్ప్పం, బహుళం, ద్రుత ప్రకృతికాలు,

   ఉపధ, ప్రాతి పదిక, ప్రత్యయం, భాషాభాగాలు, విభక్తులు మొదలగునవి .)

   బి) సంధులు – నిర్వచనాలు

   సంస్కృత – సవర్ణదీర్ఘ, గుణ, వృద్ధి, యణాదేశ సంధులు మాత్రమే

   తెలుగు –   అత్వ, ఇత్వ, యడాగమ, ఆమ్రేడిత, ద్విరుక్తటకార, ద్రుతప్రకృతిక, సరళాదేశ, గసడదవాదేశ
   సంధులు మాత్రమే

   సి) సమాసాలు – నిర్వచనాలు

   ద్వంద్వ, ద్విగు, తత్పురుష, కర్మధారయ, బహుప్రీహి, అవ్యయీభావ సమాసాలు.

   డి) ఛందస్సు – వృత్తములు

   ఇ) అలంకారాలు – శబ్దలంకారాలు (వృత్త్యనుప్రాస, ఛేకానుప్రాస, లాటానుప్రాస, అంత్యాను ప్రాస).
                          అర్థాలంకారాలు(ఉపమా, రూపక, ఉత్ప్రేక్ష, అతిశయోక్తి)

   ఎఫ్) క్రియలు రకాలు – క్త్వార్థం, చేదర్థకం మొ॥వి.

   జి) వాక్యాలు – భేదాలు (సామాన్య, సంయుక్త, సంశ్లిష్ట, ఆశ్చర్యార్థక, ప్రశ్నార్థక, కర్తరి, కర్మణి,
                          వ్యతిరేకార్థ వాక్యాలు). ప్రత్యక్ష, పరోక్ష కథనాలు.

Urdu: Content (30 Marks)

اردو   (میتھاڈالوجی نہیں ہوگی)

I   مطالعہ کا فہم :   1)   ان دیکھا نثر
                         2)   ان دیکھی نظم

II   جماعتِ اوّل   تا جماعتِ ہشتم تک کی تدریسی کتابیں
        A)   اصناف اور خصوصیات
        B)   شعراء و ادباء کا تعارف
        C)   سوانحِ حیات اور ادبی کارنامے

III   لفظیات   (صرف کتاب میں موجود مواد)
        A) ۔ معنی
        B) ۔ مترادفات
        C) ۔ ذومعنی
        D) ۔ اضداد
        E) ۔ محاورے
        F) ۔ مذکر و مونث

IV ۔ زبان شناسی

        A) ۔   تشبیہہ
        B) ۔   اسم عام اور اسم خاص کی قسمیں
        C) ۔   تلمیح
        D) ۔   صفت اور اس کے اقسام
        E) ۔   ردیف ، قافیہ
        F) ۔   سابقے اور لاحقے
        G) ۔   حروف شمسی اور حروف قمری
        H) ۔   فعل ، فاعل ، مفعول
        I) ۔   رموزِ اوقاف

Hindi: Content (30 Marks)

1. **अवबोधः** पठित - अपठित - पद्य - गद्य।
2. कवि - काव्य - रचनाकार (लेखक) रचनाएँ
3. **वर्णमालाः** स्वर, व्यंजन, भेद।

   शब्दभेदः रूप, परिवर्तन के आधार पर विकरी और अविकारी शब्द।

   वचन, लिंग, कारक काल, विराम चिह्न संधि, समास, विलोम शब्द, समान अर्थ, भिन्नार्थ, मुहावरे, कहावतें, लोकोक्तियाँ।

4. अकर्मक - सकर्मक क्रियाएँ, वाक्य-वाक्य भेद - कतृवाच्य, कर्मवाच्य भाववाच्य, वाक्य और प्रयोग, वाक्य क्रम, घटना क्रम।

5. भारतीय काव्य शाश्त्र - काव्य लदण, रस, छंद, अलंकार।

6. हिंदी पाठ्य पुस्तकें (**द्वितीय भाषा**) छटवीं से दसवीं कक्षा तक (उपवाचक और पठनहेतु सहित)

Kannada: Content (30 Marks)

➢ **ಪಠನಾವಗಾಹನೆ :**

1. ಅಪರಿಚಿತ ಪದ್ಯ

2. ಅಪರಿಚಿತ ಗದ್ಯ

➢ 3 ರಿಂದ 10 ನೇ ತರಗತಿಗಳ ಕನ್ನಡ ಪಠ್ಯಪುಸ್ತಕಗಳು, ಪೂರಕ ಪಾಠಗಳಲ್ಲಿನ ವಿಷಯಗಳು.
ಕವಿ – ಕಾವ್ಯಗಳು, ಲೇಖಕರು – ಕೃತಿಗಳ ಪರಿಚಯ

➢ **ಪದ ಸಂಪತ್ತು :-**

ಅರ್ಥಗಳು, ಸಮನಾರ್ಥಕಗಳು, ನಾನಾರ್ಥಗಳು, ವೃತ್ಪತ್ತಿ ಅರ್ಥಗಳು, ತತ್ಸಮ – ತದ್ಭವಗಳು,
ನುಡಿಗಟ್ಟುಗಳು, ಲೋಕೋಕ್ತಿಗಳು.

➢ **ಭಾಷಾಂಶಗಳು :**

1. ವ್ಯಾಕರಣ ಪಾರಿಭಾಷಿಕ ಪದಗಳು [ತತ್ಸಮ, ತದ್ಭವ, ದೇಶ್ಯ, ಅನ್ಯದೇಶ್ಯ, ಗ್ರಾಮ್ಯ ಪದಗಳು]

2. **ಸಂಧಿಗಳು :** (ಕನ್ನಡ ಮತ್ತು ಸಂಸ್ಕೃತ ಸಂಧಿ) ಸಂಧಿಗಳ ಗುರುತಿಸುವಿಕೆ, ಸೂತ್ರಗಳಾನ್ವಯ.

3. **ಸಮಾಸಗಳು :** ವಿಗ್ರಹ ವಾಕ್ಯಗಳನ್ನು ಗುರುತಿಸುವಿಕೆ. ವಿಗ್ರಹ ವಾಕ್ಯಗಳನ್ನು ಸಮಾಸ
ಪದಗಳಾಗಿ ಜೋಡಿಸುವುದು, ಸೂತ್ರಾನ್ವಯ.

4. **ಛಂದಸ್ಸು :** ವಿಧಗಳು, ಮಾತ್ರಾಗಣ, ಅಕ್ಷರಗಣ ಮತ್ತು ವೃತ್ತಗಳು

5. **ಅಲಂಕಾರ :** ಶಬ್ದಾಲಂಕಾರ, ಅರ್ಥಾಲಂಕಾರ (ಉಪಮ, ರೂಪಕ, ಉತ್ಪ್ರೇಕ್ಷ, ದೃಷ್ಟಾಂತ)

6. ವಾಕ್ಯಗಳ ವಿಧಗಳು (ಸಾಮಾನ್ಯ, ಸಂಯುಕ್ತ, ಮಿಶ್ರ, ಆಶ್ಚರ್ಯ, ಪ್ರಶ್ನಾರ್ಥಕ, ವಿರುದ್ಧಾರ್ಥಕ,
ನಕಾರಾತ್ಮಕ, ನಿಷೇಧಾತ್ಮಕ, ಕರ್ತರಿ, ಕರ್ಮಣಿ)

7. ಕ್ರಿಯಾಪದ – ವಿಧಗಳು [ಅಕರ್ಮಕ, ಸಕರ್ಮಕ,]

Tamil: Content (30 Marks)

I. புரிந்துகொள்ளுதல் – விடையளித்தல்

அ) அறியாச் செய்யுள்   ஆ) அறியாப் பத்தி

II. **6 ஆம் வகுப்பிலிருந்து 10 ஆம் வகுப்புவரை தமிழ் பாடப்புத்தகத்திலுள்ள அனைத்தும்.**

அ) முறைகள் – பண்புகள்   ஆ) கவிஞர், புலவர் ஆசிரியர் குறிப்பு

இ) சிறப்பு அம்சங்கள்

III. **சொல்லாக்கம் :**

அ) சொற்பொருள்   ஆ) ஒருசொல் பலபொருள்   இ) ஒருபொருள் பலசொல்

ஈ) இருபொருள்   உ) சேர்த்து எழுதுக   ஊ) பிரித்து எழுதுக

எ) நிறுத்தற்குறிகள்   ஏ) வழக்கு   ஐ) வழு   ஒ) மரபுத்தொடர்

ஓ) பிறமொழி சொல்லுக்கு தமிழ்ச்சொல்

Oriya: Content (30 Marks)

1. ଅବବୋଧ ପରୀକ୍ଷଣ : –

a) ଅପରିଚିତ ପଦ୍ୟ   b) ଅପରିଚିତ ଗଦ୍ୟ

2. ପ୍ରଥମରୁ ଅଷ୍ଟମ ଶ୍ରେଣୀ ପର୍ଯ୍ୟନ୍ତ ସାହିତ୍ୟ ପାଠ୍ୟବହି ଅନ୍ତର୍ଗତ :–

a) ସାହିତ୍ୟର ବିଭିନ୍ନ ବିଭାଗର ସଂଜ୍ଞା, ସ୍ରୂପ   b) କବି /ଲେଖକ ପରିଚୟ

c) ବିଷୟବସ୍ତୁର ବୈଶିଷ୍ଟ୍ୟ

3. ଶବ୍ଦ ଭଣ୍ଡାର : –ପାଠ୍ୟଭିତ୍ତିକ :–

a) ଶବ୍ଦାର୍ଥ   b) ପ୍ରତିଶବ୍ଦ   c)ଭିନ୍ନାର୍ଥ ବୋଧକ ଶବ୍ଦ

d) ଭିନ୍ନ ଜାତୀୟ ଶବ୍ଦ   e)ବିପରୀତାର୍ଥ ବୋଧକ ଶବ୍ଦ f) ସମୋଚ୍ଚାରିତ ଶବ୍ଦ

g) ଯୁଗ୍ମ ଶବ୍ଦ   h) ପଦ୍ୟ,ଗଦ୍ୟ ରୂପ   i) ଏକ ପଦରେ ପ୍ରକାଶ କର

j) ଲିଙ୍ଗ, ବଚନ, ପୁରୁଷ,ରୂଢ଼ି, ଲୋକବାଣୀ, ଶୁଦ୍ଧ ଶବ୍ଦ

4. ଭାଷା ପ୍ରକରଣ : –

a) ତତ୍ସମ, ତଦ୍ଭବ, ଦେଶଜ, ବିଦେଶିକ ଶବ୍ଦ

b) ପଦ ପ୍ରକରଣ – ବିଶେଷ୍ୟ, ବିଶେଷଣ, ସର୍ବନାମ, କ୍ରିୟା ଓ ଅବ୍ୟୟ ପଦ

c) ସନ୍ଧି –ସ୍ରର ସନ୍ଧି, ବ୍ୟଞ୍ଜନ ସନ୍ଧି, ବିଃସର୍ଗ ସନ୍ଧି

d) ସମାସ –ଦ୍ନ୍ଦ,ଦ୍ବିଗୁ, ତତ୍ପୁରୁଷ,କର୍ମଧାରୟ, ଅବ୍ୟୟୀଭାବ ବହୁବ୍ରୀହି

e) ଛନ୍ଦ – ସଂଜ୍ଞା, ସ୍ରୂପ, ପ୍ରକାର ଉଦେ, ଲକ୍ଷଣ

f) ଅଲଙ୍କାର – ଶବ୍ଦାଲଙ୍କାର(ଅନୁପ୍ରାସ,ଯମକ,ଶ୍ଲେଷ) ଅର୍ଥାଲଙ୍କାର(ଉପମା, ରୂପକ, ଉତ୍ ପ୍ରକେକ୍ଷା)

g) ବାକ୍ୟ–ପ୍ରକାର ଉଦେ(ସରଳ, ଯୌଗିକ, ଜଟିଳ ଓ ମିଶ୍ରବାକ୍ୟ),ପ୍ରତ୍ୟକ୍ଷ, ପରୋକ୍ଷଉକ୍ତି

Sanskrit: Content (30 Marks)

1. **पठनावगमनम्ः** परिचितशलोकः - प्रश्नाः
   परिचितगघम् - प्रश्नाः

2. कवयः - काव्यम् - रचयितारः - रचनाः ।

3. **पाठ्यप्रक्रियाः** पद्य - गद्य - चम्पू - दण्डक - शतक - आत्मकथा - इत्यादयः

4. **पाठ्यांशाधारितप्रश्नाः**

5. **भाषांशाः** समानार्थक
   विरुद्धार्थक
   सन्धि
   समास
   छन्दः
   अलङ्कारः
   विभक्ति

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

VOCABULARY		LEVEL OF TESTING
Synonyms		Identification
Antonyms		Identification
Homophones		Identification
Homonyms		Identification
Hypernyms and Hyponyms		Identification
Spelling		Spelling
Phrasal Verbs		Identification of Meaning
Word Formation		Suffixes and Prefixes
One word substitutes		Referring to Persons / Professions and Places
Short forms and Full forms		Commonly used short forms and full forms in English
Abbreviations and Full forms		Commonly used Abbreviations and their full forms
GRAMMAR		LEVEL OF TESTING
Helping Verbs		Forms, contractions
Modal Auxiliaries		Form, Function & Contractions
Ordinary Verbs		Form, Function & Contractions
Articles		Use of Articles
Prepositions		Simple Prepositions Including Prepositions following Certain Words

Clauses		Main Clauses, sub-ordinate Clauses, Noun Clauses, If Clauses, Relative Clauses
Sentence Structures		Basic Sentence Structures
Degrees of Comparison		Form, Function, Construction, Transformation
Language Functions		Language Functions with social norms (Formal and Informal)
Question Tags		Imperatives and Statements
Types of Sentences		Types of Sentences
Direct Speech & Indirect Speech		Statements, Questions, Imperatives
Active Voice & Passive Voice		Active Voice & Passive Voice
Tenses		Use of tenses and framing including IF conditionals Type 1 &3
Agreement between subject & Verb		Agreement between Subject & Verb
Word Order		Word Order in a phrase or a sentence
Parts of Speech		Nouns, Pronouns, Adjectives, Adverbs, Conjunctions - Types and functions
Linkers		Linkers
Transformation of Sentences		Simple, Compound and Complex Sentences
Common Errors		Based on all Vocabulary and Grammar Topics
MECHANICS OF WRITING		**LEVEL OF TESTING**
Punctuation and Capitalization		Use of capital letters, comma, full stop, question mark, exclamation mark and inverted commas
DISCOURSES		**LEVEL OF TESTING**
Writing of Discourses		Letter Writing and News Report
DICTIONARY SKILLS		**LEVEL OF TESTING**
DICTIONARY SKILLS		DICTIONARY SKILLS
READING COMPREHENSION		**LEVEL OF TESTING**
Prose		Prose (general)

PART - B

Mathematics Content (24Marks)

I. Arithmetic

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

II. Number System

Knowing Our Numbers –rounding of numbers - Whole Numbers- predecessor – successor – number line -Playing With Numbers – divisibility rules -LCM & HCF -Integers - Fractions - Decimals -Rational Numbers -Squares, cubes Square roots, Cube roots

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

 Polynomials & Factorisation - Linear Equations in Two Variables - Pair of Linear Equations in Two Variables - Quadratic Equations- Progressions- Sequences and series- Arithmetic Progression- properties of A.P.- Arithmetic mean –Geometric Progression –nth term–properties of AP,G.P.

VI. Statistics

DATA HANDLING - Frequency Distribution Tables and Graphs- Grouped data-ungrouped data – Measrues of Central Tendency -Mean, median & mode of grouped and ungrouped data – ogive curves.

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 (45^0, 30^0 &60^0, 0^0 &90^0) –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)

1. Meaning and Nature of Mathematics, History of Mathematics.
2. Contributions of Great Mathematicians - Aryabhatta, Bhaskaracharya, Srinivasa Ramanujan, Euclid, Pythagoras, George cantor.
3. Aims and Values of teaching Mathematics, Instructional objectives (Blooms taxonomy)
4. Mathematics curriculum: Principles, approaches of curriculum construction, -Logical and Psychological, Topical and Concentric, Spiral approaches. Qualities of a good Mathematics text book.
5. Methods of teaching mathematics- Heuristic method, Laboratory method, Inductive and Deductive methods, Analytic and Synthetic methods, Project method and Problem Solving method.
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,
9. Techniques of teaching mathematics like Oral work, Written work, Drilling, Assignment, Project, Speed and Accuracy.
10. Mathematics club, Mathematics structure, Mathematics order and pattern sequence.
11. Evaluation - Types, Tools and Techniques of Evaluation, Preparation of SAT Analysis, Characteristics of a good test.

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 S.I 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 fraction, Fluid friction

4. **Newton's law of motion:**

   History of laws of motion (Aristotle and Galilean view), Newton's I, II and III laws of motion, Linear momentum, Atwood machine (Application of Newton's law), Conservation of linear momentum and Impulse.

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 huan 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 Viceversa 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, read 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 'n_2' from 'n_1' 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, hypermatropia, pressbiopia 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 rlating of Electric appliances)

12. Electro-Magnetism:

Types of Magnets, Properties of Magnets, Magnetic compass, Earth as a Magnet, Magnetic Induction, Oirsted's experiment, Magnetic Fled, 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, Eclipces (Solar and lunar eclipses) types of Eclipces 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:

Natural / synthetic fibers, Identifying fibers – burning test, Synthetic fibers preparation and uses, Resin identification codes, Types of plastics, Plastics and environment, Biodegradable – non bio degradable, Reduce, Recycle, Re use and Recover – 4R principle.

20. Coal and petroleum:

Exhaustible and in exhaustible Resources, Fuels – Types, Uses of Coal and Petroleum and Coal products, Refining of petroleum, Petrochemical products in various sectors, Formation of coal and petroleum. Misuse of Energy resources and Consequences.

21. Combustion fuels and flame:

Combustion – Supporter combustion – Irruption Temperature. Types of Combustion. Fuels

Fire control. Structure of flame – colors zone – Intensity.

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
8. Science Curriculum and its transaction, NCF-2005, SCF-2011
9. Science Textbooks.
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.

2. **Life Processes:-** Our food, Food components, Nutrition In plants, Plants – Parts and functions, Reproduction plants, seed dispersal, Organ systems in Man, Sense Organs, Animal Behavior - What do animals eat, Nutrition – Food Supplying System, Malnutrition, Respiration- The energy releasing system, Transportation – The circulatory system. Excretion – The wastage disposing system. Coordination – The linking system. Attaining the age of Adolescence, Reproduction – The generating system. Reproduction in animals, Reproductive health, Coordination in life processes, Heredity and evolution – from parent to progeny.

3. **Our Environment:-** Our Environment – Our concern. Biodiversity - Biodiversity and its Conservation, Diversity in living organism, Soil our life, Soil pollution, Forests our life, Natural resources. Renewable and non renewable resources. Not for Drinking, Not for Breathing, Different Eco systems, adaptations in different ecosystems. Global Environmental Issues, Green house effect, Global warming, Bio- geo –Chemical cycle.

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
8. Science Curriculum and its transaction, NCF-2005, SCF-2011
9. Science Textbooks.
10. Evaluation - CCE - Formative Assessment, Summative Assessment - Designing and Administration- Analysis of Scholastic Achievement Test (SAT)