Government of Andhra Pradesh  
Department of School Education  
State Council of Educational Research & Training  
**Category of Post: PGT**  
**Paper II – Chemistry Syllabus**

Part – I  
General Knowledge and Current Affairs (Marks: 10)

Part – II  
Perspectives in Education (Marks: 10)

1. **History of Education**:
   - The Education in Ancient India - Pre-Vedic and Post-Vedic period, Medieval Education.
   - Education in Pre Independent era - Woods Despatch (1854), Hunter Commission (1882), Hartog Committee (1929), Sargent Committee (1944).

2. **Teacher Empowerment**:
   - Need, interventions for empowerment, Professional code of conduct for teachers, Teacher motivation, Professional development of Teachers and Teacher organizations, National / State Level Organizations for Teacher Education, Maintenance of Records and Registers in Schools.

3. **Educational Concerns in Contemporary India**:
   - Democracy and Education, Equality, Equity, Quality in Education, Equality of Educational opportunities.
   - Population Education, Gender - Equality, Equity and Empowerment of Women, Urbanization and migration, Life skills.
   - Adolescence Education
   - Value Education – Morel Value and Professional Eathics in Education.
   - Health and Physical Education
   - Inclusive Education - Classroom Management in Inclusive Education
   - Role of Education in view of Liberalization, Privatization and Globalization
   - Programmes and Projects – APPEP, DPEP, Sarva Siksha Abhiyan, National Programme for Education of Girls at Elementary Level (NPEGEL), Rashtriya Madhyamika Siksha Abhiyan(RMSA), Rashtriya Aveshekar Abhiyan (RAA), KGBVs, Model Schools.

4. **Acts / Rights**:
   - Right of Children to Free and Compulsory Education Act - 2009
   - Right to Information Act - 2005
   - Child Rights

Part - III

Educational Psychology (Marks: 10)

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.

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.


Part - IV

Content (Marks: 50)

I. General Chemistry:


II. Inorganic chemistry:


III. Organic Chemistry:

Structural theory in Organic Chemistry, Bond polarization, Alicyclic hydrocarbons Cycloalkanes Benzene and its reactivity, Concept of resonance, resonance energy, Heat of hydrogenation, heat of combustion of Benzene, mention of C-C bond lengths and orbital picture of Benzene, Concept of aromaticity, Huckel’s rule. Application to Benzenoid (Benzene, Napthalene) and Non Benzenoid compounds (cyclopropenyl
cation, cyclopentadienyl anion and tropylium cation) Reactions. General mechanism of electrophilic substitution, mechanism of nitration, Friedel Craft’s alkylation and acylation, Orientation of aromatic substitution. Definition of ortho, para and meta directing groups. Ring activating and deactivating groups with examples (Electronic interpretation of various groups like NO2 and Phenolic).
Orientation effect of (i) Amino, methoxy and methyl groups (ii) Carboxy, nitro, nitrile, carbonyl and Sulfonic acid groups. (iii) Halogens (Explanation by taking minimum of one example from each type). Halogen compounds, Hydroxy compounds -Polyhydroxy compounds: Carbonyl compounds, Physical and chemical properties Base catalysed reactions with mechanism: Aldol, Cannizzaro reaction, Perkin reaction, Benzoin condensation, Haloform reaction, Knoevenagel reaction. Oxidation of aldehydes: Baeyer-Villiger oxidation of ketones with mechanism. Reduction: Wolf Kishner reduction, MPV reduction, reduction with LiAlH4 and NaBH4 Analysis of aldehydes and ketones. Carboxylic acids and derivatives physical and chemical properties, Active methylene compounds Acetoacetic esters: Malonic ester: Synthetic applications, inter conversion: Nitrogen compounds: Carbohydrates: Amino acids and proteins

IV. Physical Chemistry:

V. Chemistry And Industry:
Physico Chemical methods of analysis, Separation techniques Spectrophotometry, spectroscopy, Spectral interpretation, Drugs, formulations, pesticides and green chemistry, Macromolecules, Material Science and catalysis

Teaching Methodology (Marks: 20)
2. The History and Development of Science: A brief introduction to oriental and western science, Contribution of the following Scientists in the Development of Science: Aryabhatta, BhaskaraCharya, Aristotle, Copernicus, Newton, Einstein, C.V.Raman, Various organizations working for the development of science in India.

3. Aims and Values of teaching Physical Sciences: Aims of teaching Physical Sciences, Values of teaching Physical Science, Correlation of Physics and with other subjects.

4. Objectives of teaching Physical Sciences: Meaning and importance of objectives, Bloom’s Taxonomy of Educational objectives, Specific /Behavioral objectives / (Instructional objectives), Critique on Bloom’s Taxonomy.


6. Planning for effective instruction in Science: Year Plan, Unit Plan, Lesson Plan, Learning experience, characteristics, classification, source and relevance.

7. Teaching Learning Material (TLM): Characteristics and Importance of TLM, Classification and Types of TLM, Hardware and Software in TLM, TLM Principles to be followed, Edgar Dale’s cone of learning experience.


