DIRECTORATE OF ADMISSIONS
O S M A N I A   U N I V E R S I T Y

B.Ed.(Distance Mode) Admissions : 2012- 2013

INFORMATION BROCHURE

(Rules, Regulations and Instructions:To be retained by the candidate)

> **Last date for submitting the application to the Director, Directorate of Admissions is 11.01.2013 by 4 p.m.**

Notes:

1. Admission into this course will be based on the Rank obtained in B.Ed.(Distance Mode) Entrance Test.

2. Candidates called for centralized admission will have to appear for the same at their own expense.

3. The eligibility of the candidates is not verified/decided at the time of application and during the entrance test.The verification will be done only during the admissions. Hence, candidates are advised to ensure   that they are eligible for the B.Ed. (DM) course before application.

4. Not withstanding any thing contained in this brochure, the rules and regulations that are in force in the University on the date of admission will be final.

5. Filled in applications should reach the Director, Directorate of Admissions, O.U. well before the last date. The Directorate will not take any responsibility in case of postal delay.

6. Submit the filled in application along with ICR sheet and Demand Draft towards registration fee to the following.

> **The Director**
> Directorate of Admissions
> Near PGRR Centre for Distance Education
> Osmania University, Hyderabad – 500 007(AP)
> Phone : 040-27090136

RULES, REGULATION and INSTRUCTIONS For B.Ed. (DM) ENTRANCE TEST : 2012 - 2013

I. INSTRUCTIONS:
   (a) Read the given instructions carefully before filling up the application form.
   (b) candidates are advised to ensure that they fulfill all the eligibility conditions for admission into the course, before applying for the entrance test. Qualifying in the entrance test alone does not confer a right of admission into the course.

II. Registration & Submission of Application Form:
   The Application form should be submitted to The Director, Directorate of Admissions, New Building (Near PGRR CDE) Osmania University Campus, Hyderabad - 500 007 on any working day between 10.00 a.m to to 4.00 p.m. either in person or by post before the last date of submission.

III B. Ed (Distance Mode) Programme Study Centers : It is a part-time two year programme with contact classes during vacations being offered at the   following study centers under Osmania University :

   1) **Malla Reddy College of Education, Suraram 'X' Roads,Quthbullapur (M), Ranga Reddy Dist.**
   2) **N.S.R. College of Education, V.V. Campus, Jambagh, Koti, Hyderabad.**
   3) **Islamia College of Education, Mustabad Road, Siddipet, Dist. Medak.**
   4) **Gokul College of Education, Gokul Nagar, Nalgonda.**
   5) **Govt. College of Teacher Education, Mahabubnagar.**

IV. The candidates seeking admission into B.Ed. (Distance Mode) has to satisfy the following conditions:

   1. a) Teachers with a Bachelor's Degree serving in a recognized Primary / Elementary / Secondary / Sr.Secondary school and having at least two years experience of school teaching at any of the above level are eligible for admission to the course.
       b) Osmania University will admit only those candidates who are presently working in schools located in the territorial jurisdiction assigned to it by the University Act. (O.U. Local area, for details, about OU Local area see Annexure – I/A)

   2. Candidates shall have to produce a certificate of service from the Head of the institution / Employer and self declaration of the service. The candidate should submit no objection certificate from the present employer.

   3. The candidate seeking admission must qualify in the B.Ed. (Distance Mode) Entrance Test and satisfy the norms prescribed by the University.

   Note: The Working experience of two years should be completed as on the date of admission into B.Ed. (Distance Mode) programme.

V. Admission procedure:
   i) The admissions shall be made in the order of merit on the basis of the rank obtained in the B.Ed. (Distance Mode) Entrance Test to the extent of sanctioned intake of 500 seats.
   ii) The percentage of candidates to be admitted in each methodology (subject) shall not exceed the limit prescribed by the University / Government from time to time. The percentage of admissions into the five methodologies as per the rules in vogue is as follows:

			(Code No)	
a)	**Mathematics Methodology (MS)**	:	01	25%
b)	**Physical Sciences Methodology (PS)**	:	02	10%
c)	**Biological Science Methodology (BS)**	:	03	20%
d)	**Social Studies Methodology (SS)**	:	04	35%
e)	**English (EM)**	:	05	10%

 VI) SCHEME OF B.Ed. (Distance Mode) Entrance Test: The common entrance test will be of objective type with 100 multiple choice questions and of 90 minutes duration.

Part – A : General English   : 20 marks ⎤ Part-A and Part-B is common for all the
Part – B : 1) General Knowledge : 10 marks ⎬ candidates irrespective of Methodology.
          2) Teaching aptitude   : 10marks ⎦

Part – C: Methodology : Candidate has to choose one of the following subjects and it consists of 60 questions for 60 marks.
   1) Mathematics   : 60 marks
   2) Physical Sciences   : 60 marks (Physics   : 30 marks & Chemistry   : 30 marks)
   3) Biological Sciences   : 60 marks (Botany   : 30 marks & Zoology   : 30 marks)
   4) Social Studies   : 60 marks (Geography : 20 marks, History   : 20 marks
                                              Civics   : 10 marks & Economics   : 10 marks)
   5) Special English   : 60 marks

Note: In case of a tie in the rank, the order of merit will be decided on the following basis : (a) marks secured in part A of entrance test (b) in part B of entrance test (c) the marks of qualifying examination and (d) age of candidate (senior in age getting higher priority).

VII. ELIGIBILITY CRITERIA:

METHODOLOGY	ELIGIBILITY
1. Mathematics	Candidate with B.A./B.Sc. with Mathematics as one of the group subjects or B.C.A. candidates with Mathematics at Intermediate level as a group subject.
2. Physical Sciences	Candidates with B.Sc. who have studied Physics and Chemistry or allied materials sciences under Part – II group subjects or B.C.A. candidates with Physical Sciences (Physics and Chemistry) at Intermediate level as group subject.
3. Biological Sciences	Candidates with B.Sc./B.Sc.(Home Science) who have studied Botany and Zoology or allied Life Sciences under Part – II group subjects or B.C.A. candidates with Biological Sciences at Intermediate level as group subject.
4. Social Studies	All candidates with B.A./B.Com./B.B.M. and B.C.A. candidates with Social Sciences at Intermediate level as group subject.
5. English	Candidates with B.A English as special Subjects.

Note: **Candidates must have obtained at least 50% marks in qualifying examination. However, for those working teachers who joined in the service prior to 30th March, 2010, a minimum pass in qualifying examination is sufficient.**

VIII. SYLLABUS(for Entrance Test) :
Detailed syllabus for Part - A, Part – B and Part – C (for all the methodologies) along with model papers will be made available on OU website : www.osmania.ac.in/admissions

IX. RESERVATION:
1. **Local and Non-Local Candidates**
   i) Admission to 85% of the available seats in every methodology shall be reserved in favour of the Local candidates in relation to the local area in respect of O.U. subject to community and other reservations in force.
   ii) The remaining 15% of the seats which are open to both local and non-locals shall be filled up subject to similar reservation as applicable to 85% local candidates (See annexure I).
2. **S.C., ST. and B.C. candidates**: Of the total number of seats available in each methodology, following is the schedule of reservation of seats for these categories.

Scheduled Tribe*	:	**6 percent**
Scheduled Cast*	:	**15 percent**
Backward Class*	:	
Group-A	:	**7 percent**
Group-B	:	**10 percent**
Group-C	:	**1 percent**
Group-D	:	**7 percent**
Group-E	:	**4 percent** (Subject to court judgement)

* Community, Nativity and Date of Birth Certificate for S.C., S.T., and B.C. candidates as per G.O. Ms.No. 58, Social Welfare (J) Dept, dated: 12-5-1997.

Note:
a. While filling up the seats reserved for Backward class candidates, If qualified Backward Class-A candidates are not available, the turn will go to Backward Class-B, Backward Class-C and other Backward Class-D in the order of merit in each group. If no suitable candidate is available in any of the four groups, the seats shall be filled up from general pool on the basis of merit.
b. If sufficient number of candidates are not available to fill up the seats reserved for S.C's they shall be filled up by suitable candidates from S.T.s and vice versa. If the required number of candidates are not available for filling the quota of seats reserved for S.Cs & S.Ts they may be filled up by candidates from the general pool on the basis of merit.
c. Wherever applicable, a minimum of 33 1/3% of the available seats will be allotted to women candidates from each category i.e., open competition, S.T., S.C., BCs Groups A,B,C,D taking each college as a unit. This rule is not applicable (i) If women candidates selected on merit in each category form 33 1/3% or more of the seats therein; In the absence of suitable women candidates in the respective categories, these seats shall be filled in with men candidates of the same category.

d. Seats shall also be reserved in each methodology for the following categories, to the extent indicated against them.
   i) Physically Handicapped (PH)-There shall be 3% (three percent) horizontal reservation in each category (OC, BC,SC,ST) for visually handicapped / hearing impaired/Orthopaedically Handicapped/(each 1%).
   ii) Children of Armed Forces Personnel (CAP) – There shall be 2% (two percent) horizontal reservation for the children of armed persons i.e.Ex-Servicemen, Defence personnel including the Children of Border Security Force and the Central Reserve Police Force residing in Andhra Pradesh for a minimum period of 5 years. After exhausting all the Children of Armed Personnel, the unfilled seats shall be allotted to Ex-Servicemen on merit and if any seats are still available, the spouses of serving defence personnel shall be considered in the order of merit.
   iii) National Cadet Corps (NCC)-There shall be 1% (one percent) horizontal reservation for national Cadet Corps Candidates.
   iv) Sports and Games (SP)-There shall be ½ % (half percent) horizontal reservation for sports and games candidates.
   Provided if qualified candidates belonging to CAP/NCC/SP/PH categories are not available, the left over seats shall be filled up with candidates of general pool of the same local area.

Note: a) The candidates claiming reservation benefit under the above categories shall produce Original documents in support of their claim to the Directorate of Admissions and the Directorate of Admissions shall be entitled to refer the original documents of the candidates claiming reservation for scrutiny and confirmation, to the following authorities.

i)	NCC	: The Director of NCC, Andhra Pradesh
ii)	Sports & Games	: Head, Department of Physical Education, O.U.
iii)	Physically handicapped	: Chief Medical Board, Conducted, O.U.
vi)	CAP	: The Director, Sainik Welfare Board, A.P.

b) The priorities in respect of the special categories mentioned above shall be in accordance with Government Orders issued from time to time.
c) There shall be a reservation of 33 1/3% of seats in favour of Women candidates in each methodology and in each category.

X. CERTIFICATES TO BE SUBMITTED AT THE TIME OF ADMISSION:
Candidates called for admission must present in person and submit all the ORIGINAL certificates listed below, along with two sets of xeroxcopies.
1. B.Ed.(Distance Mode) Entrance Hall Ticket.
2. B.Ed.(Distance Mode) Entrance Rank Card.
3. Degree certificate (or Provisional Certificate if Degree Certificate is not yet issued as per rules) of qualifying examination.
4. Memorandum of Marks (Part-I and Part-II) of the qualifying degree examination.
5. Two years experience certificate (as per Para-IV and No-objection Certificate from the employer.
6. Proof of Local / Non-Local candidates, according to rules in force. Those who have studied Intermediate and Degree courses as regular students need submit only the bonafide certificates from colleges. In case, there is a break in the four consecutive years preceding the qualifying examination, the candidates must submit bonafide certificate of 9th and 10th class. Non-local candidates should submit i) a residence certificate for 10 years of either of the parents from M.R.O. or ii) employee certificate from the employer in term of clause II b,c,d, or e of Annexure - I.
7. Community, Nativity and Date of Birth Certificate for S.C/S.T./B.C., candidates as per G.O.M.S. No. 58 Social Welfare (J) Department dated 12-5-1997.
8. Required course fee plus the counseling fee.

XI. FEE DETAILS :
B.Ed.(Distance Mode) course fee is Rs. 20,000/- for all the candidates including BC/SC/ST Candidates.

XII. A candidate who is allotted a seat at the time of spot admission, will have to pay the required fee immediately on allotment.

XIII. Cancellation fee: Once the seat is alloted, the candidate is not permitted to cancel the admission unless he/she pays a cancellation fee of 10% of total fee. cancellation will not be allowed once the final counselling is over.

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ANNEXURE - I

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RULES OF ADMISSION IN ACCORDANCE WITH THE ANDHRA PRADESH EDUCATIONAL INSTITUTIONS (REGU LATION OF ADMISSION) ORDER 1974.

I. Admission to 85% of the available seats in every course of study provided by the Osmania University, shall be reserved in favour of LOCAL CANDIDATES in relation to the LOCAL AREA in respect of the Osmania University subject to community and other reservations in force.
   A. LOCAL AREA:
   The part of the State comprising the districts of Adilabad, Hyderabad (including twin cities), Karimnagar, Khammam, Mahabbobnagar, Medak, Nalgonda, Nizamabad, Ranga Reddy and Warangal shall be regarded as the local area for the purpose of admission to the Osmania University.
   B. LOCAL CANDIDATE:
   1. A candidate for admission to any course of study shall be regarded as a Local Candidate in relation to local area:
      i). If he has studied in an educational institution or educational institutions in such local area for a period of not less than four consecutive academic years ending with the academic year in which he appeared or as the case may be, first appeared in the relevant qualifying examination or.
      ii) Where, during the whole or any part of the four consecutive academic years ending with the academic year in which he appeared or, as the case may be, first appeared for the relevant qualifying examination, he has not studied in any educational institution if he has resided in that local area for a period of not less than four years immediately preceding the date of commencement of the relevant qualifying examination in which he appeared or, as the case may be, first appeared.
   2. A candidate for admission to any course of study who is not regarded as a local candidate under sub-paragraph (1) in relation to any local area shall:
   a) If he has studied in an educational institution in the State for a period of not less than seven consecutive academic years ending with the academic year in which he appear or, as the case may be first appeared for the relevant qualifying examination be regarded as a local candidate in relation to
      i) Such local area where he has studied for the maximum period out of the said period of seven years, or
      ii) Where the periods of study in two or more local areas are equal, such local area where he has studied last in such equal periods; or
   b) If, during the whole or any part of the seven consecutive academic years ending with the academic year in which he appeared, or as the case may be, first appeared for the relevant qualifying examination, he has not studied in the educational institution in any local area, but has resided in the State during the whole of the said period of seven years be regarded as a local candidate in relation to.
      i) Such local area where he has resided for the maximum period out of the said period of seven years : or,
      ii) Where the periods of his residence in two or more local areas are equal, such local area where he has resided last in such equal periods.

II. The remaining 15% of the available seats, which are open to local and non-local, shall be filled up subject to similar reservation as applicable to 85% local candidates as below:
   a) All candidates who have studied in a recognised educational institution or institutions in the State for a period of not less than four consecutive academic years ending with the academic year in which they appeared or as the case may be, first appeared in the relevant qualifying examination, or where during the whole or any part of such four consecutive academic years, if they have not studied in any educational institutions, if they have resided in the State for a period of not less than four years immediately preceding the date of commencement of the relevant qualifying examination.
   b) Candidates who have resided in the State for a total of ten years excluding periods of study outside the State, or either of whose parents have resided in the State for a total period of ten yeas excluding the periods of employment outside the state.
   c) Candidates who are children of parents who are in employment of this State or Central Government, Public Sector Corporations; Local Bodies, Universities and other similar quasi-public institutions within the state.
   d) Candidates who are spouses of those in the employment of this Sate or Central Government, Public Sector Corporations; Local Bodies, Universities and Educational Institutions recognised by the Government, a University or other competent authority and other similar quasi-public Institutions within the State.
   e) Candidates who are employees in a State, Central Govt. undertakings, Public Sector Corporations, Local Bodies, Universities and other similar quasi-public institutions within the state.

OSMANIA UNIVERSITY

ICR SUMMARY SHEET for B.Ed. (DISTANCE MODE) : 2012 - 2013

☞ *Instructions to fill the ICR form*

   a. Do not staple, wrinkle, scribble, wet or fold this form.
   b. Use only black ink or ball point pen to fill this form.
   c. Leave one box blank between surname and name.
   d. Write relevant codes in the boxes as applicable.
   e. Do not make any stray marks on this ICR form (application form).
   f. Please make sure that the letters/codes written should not touch the edges of the box.

Registration No.
(For office use only)

1. Name of the candidate [write in CAPITAL letters without touching edges of the boxes]

2. Father's /Mother's Name [write in CAPITAL letters without touching edges of the boxes]

| D | D | M | M | Y | Y | Y | Y |

3. Date of Birth

4. Fee paid Rs.

Darken the appropriate circle ●

5. Category

  SC ○   ST ○   BC-A ○   BC-B ○   BC-C ○   BC-D ○   BC-E ○   Others ○

6. Qualifying Examination

  B.A ○   B.Com. ○   B.Sc. ○   Others ○

7. Residential Status

  Local ○   Non Local ○

8. Sex

  Male ○   Female ○

9. Special Category.

  NCC ○   SPORTS / GAMES ○   CAP ○   PH ○

10. Write Methodology Code and name in which the candidate wishes to write entrance test.
    [Please refer Instruction Booklet for Subject codes]

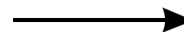Methodology code: Methodology Name :

11. Address for communication
   (Please write in **CAPITAL LETTERS** with **Black Ink** only)

Name :

Address:

PIN

Mobile/Phone No.:

Do not attest the photograph →

12. Paste your recent passport size color Photograph (it should be identical to the one affixed on the application) (Do not Pin/Staple the Photograph)

13. Signature of the candidate within the box given above

SYLLABUS FOR B.Ed. (DISTANCE MODE) ENTRANCE TEST ; 2012-13

PART – A : GENERAL ENGLISH:

1.   Reading Comprehension.

2.   Correction of Sentences, Articles, Prepositions, Tenses, Spelling.

3.   Vocabulary, Synonyms, Antonyms.

4.   Transformation of Sentences - Simple, Compound and Complex. Voices, Direct Speech and Indirect Speech.

PART – B : GENERAL KNOWLEDGE & TEACHING APTITUDE:

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.

4. 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.

PART- C : METHODOLOGIES:

1. MATHEMATICS METHODOLOGY

1. Sets - relations - binary operations - semi groups - groups - subgroups-normal subgroups - homomorphism-Functions permutations permutation groups - cyclic groups - quotient group - automorphism.

2. Rings - Integral domains - fields - characteristic - homomorphism – Ideals-Prime Ideals - maximal ideals - Rings of permutations - polynomials - polynomial rings.

3. Vector spaces - linearly independent vectors - Basis - dimension - linear transformation -- Null space -- Range -- Rank of a linear transformation.

4. Elementary matrix operations - Elementary matrices - Determinants - properties - rank of matrix - inverse of a matrix - Eigen vectors - Eigen values - systems of linear equations.

5. Three dimensional geometry -- Coordinates -- distance formula - direction cosines - plane - angle between two planes - perpendicular distance from a point - Equation of a line - skew lines - shortest distance - The sphere - tangent plane power of a point - polar plane and pole - radical plane - coaxial system of spheres - The circle - radius - centre.

6. Real numbers - properties - functions - range - sequences - series - limits - continuity - differentiability - differentiation - mean value theorems -- L'Hospital rules -- Integration   definite integrals - Reimann integral.

7. Differential equations - first order and first degree - different forms - Exact differential equations - change of variables - equation of first order but not of first degree -   higher order linear differential equations - system of linear differential equations.

8. Elements of Number theory - Divisibility - primes - congruences - solutions of congruences - congruences of degree 1   The Euler function O.

9. Quadratic equations - quadratic expressions - change of sign - roots - maximum - minimum values

Syllabus for Methodology - 1: Mathematics

Standard -VIII:

1) Review of Real Numbers
2) Commercial Mathematics
3) Mensuration
4) Sets and Relations
5) Elementary Number Theory
6) Exponents
7) Polynomials
8) Factorization
9) Linear Equations
10) Linear Inequations
11) Introduction of Geometry
12) Straight Lines
13) Triangles and Polygons
14) Circles and Concurrent Lines in Triangles
15) Symmetry

Standard - IX:

1) Arithmetic.
2) Revision of Exponents and Algebraic Expressions.
3) Square roots of Algebraic Expressions.
4) Sets.
5) Relations.
6) Linear Equations and Inequations
7) Matrices
8) Geometry
9) Motion (Transformation) Geometry
10) Statistics
11) Computing

Standard - X:

1) Statements and Sets.
2) Functions of Mappings.
3) Polynomials over Integers.
4) Linear Programming.
5) Real Numbers.
6) Progressions.
7) Geometry.
8) Analytical Geometry.
9) Trigonometry.
10) Statistics.
11) Matrices.
12) Computing Trigonometrical Tables.

2. PHYSICAL SCIENCES METHODOLOGY

PHYSICS:

1. **Vector Analysis:** Scalar and Vector fields, Gradient of a scalar field. Divergence and curl of a vector field
2. **Mechanics of particles:** Laws of motion, Motion of variable mass system. Conservation of energy and momentum.
3. **Mechanics of Rigid bodies:** Definition of Rigid body, rotational kinematics relations, equation of motion for a rotating body, angular momentum. Eulers equation, precession of a top.
4. **Central forces:** Central forces - definition and examples, Conservative nature of central forces. Equation of motion under a central force, Gravitational field, motion under inverse square law, derivation of Kepler's laws.
5. **Fundamentals of vibrations:** Simple harmonic oscillator and solution of the differential equation-physical characteristics of SHM, frequency of loaded spring taking its mass into consideration.
6. **Damped and forced oscillations:** Damped harmonic oscillator, solution of the differential equation of damped oscillator. Energy consideration, comparison with undamped harmonic oscillator.
7. **Vibrating strings:** Transverse wave propagation along a stretched string, general solution of wave equation and its significance, modes of vibration of stretched string clamped at both the ends, overtones.
8. **Kinetic theory of gases:** Deduction of Max Well's law of distribution of molecular speeds - Transport phenomena - Viscosity, thermal conduction and diffusion of gases.
9. **Thermodynamics:** Heat and work - Internal energy - Indicator Diagrams work done is Isothermal and adiabatic processes - First law of thermodynamic - significance and applications of first law of thermodynamics - Reversible and irreversible process - Carnot's theorem - Carnot's engine, efficiency - Clausius - Clapeyron equation - Second law of thermodynamics, different statements - Thermodynamic scale of temperature-Entropy concept - Entropy and disorder measurement of entropy changes in reversible and irreversible processes - Entropy of universe - Entropy - Temperature diagrams,
10. **Quantum theory of Radiation:** Block body Fery's black body distribution of energy in the spectrum of a black body - Wien's displacement law, Wien's law; Raleigh Jean law - Quantum theory of radiation - Planck's law deduction of Wien's law, Releigh Jeans law Wien's displacement from Planck's law.
11. **Statistical thermodynamics:** Introduction of statistical mechanics - statistical equilibrium - probability theorems in statistical thermodynamics - Max Well - Boltzmann distribution law (Statement and expression only) - Application to ideal gas. Quantum Statistics - Phase space - Fermi - Dirac distribution law (statement and expression only) - Application to electron gas - Bose -- Einstein distribution law (statement and expression only) - application to photon gas - comparison of three statistics.
12. **Interference:** The superposition principle - coherence - temporal and spatial conditions for interference of light. Interference by division of wave front - Fresnel's bipism - determination of wavelength of light chance of phase on reflection - determination of thickness of a transparent material using prism. Interference by division of amplitude - oblique incidence of a plane wave on a thin film (the cosine law) - coloures of thin films - non reflecting thin films - interference by a plane parallel film illuminated by a point surface - interference by film with two

non parallel reflecting surfaces (wedge shaped film)-determination of diameter of wire Newton's rings in reflected and transmitted light. Determination of wavelength of monochromatic light Michelson Interferometer, types of fringes, determination of wavelength of monochromatic light, thickness of a thin plate.

13. **Diffraction:** Fraunhofer diffraction - diffraction due to a single slit and circular aperture. Limit of resolution - two-slit Fraunhofer diffraction - Fraunhofer diffraction pattern with N-slits - The Fourier transform and its properties - the shifting theorem and application of the FT to Fourier diffraction due to single slit, A double slit and the diffraction grating - The diffraction grating normal and oblique incidence determination of wavelength of light.

14. **Polarization and double effraction:** Polarized light - Brewsters law - Malus Law - phenomenon of double refraction is calcite - Refraction of plane wave icident on a negative crystal like calcite - Nichol prism. Analysis of polarized light by quarter wave plate - Babinet compensator.

15. **Lasers fiber** optics **and Holography:** Spontaneous, stimulated emission - Laser principle - population inversion - Einstein coefficients - Types of lasers, He - and New Ruby lasers and the application of lasers.

16. **Electrostatics:** Gauss law and its applications, electric field due to an infinite conducting sheet of chare, uniformly charged sphere and charged cylindrical conductors, mechanical force on a charged conduct, electric potential, potential due to charged spherical conductor, and electric dipole and an infinite line of charge.

17. **Dielectrics:** An atomic view, potential energy of a dipole in an electric field, polarization and charge density, dielectrics and Gauss's law - Relation between D.E. and P-Dielectric constant and susceptibility, Boundary conditions at the dielectric surface.

18. **Capacitance:** Capacity of concentric spheres and cylindrical condenser, capacity of parallel plate condenser with and without dielectric –
electric energy stored by a charged condenser - force between plates of condenser, attracted disc electrometer construction and working.

19. **Magnetostatics:** Magnetic shall-potential due to magnetic shell - field due magnetic shell - equivalent of electron circuit and magnetic shell - application of field due to magnetic shell - magnetic induction (B) and field (H) - Permeability and susceptibility - Hysteresis loop.

20. **Moving charge in electric and magnetic fields:** Hall effect, cyclotron, synchrocyclotron and synochrotron - force on a current carrying conductor, force and torque on current loop - Biot Severt's law and calculation of B due to long straight wire, circular a current loop and solenoid.

21. **Electromagnetic induction:** Faraday's law - Lenz's law - expression for induced emf - electromotive force-time varying magnetic fields - Betatran - Ballistic galvanometer - theory - damping correction - self and mutual inductance, coefficient of coupling, calculation self inductance of along solenoid - toroid - energy stored in magnet in field principles of transformer.

22. **Varying and alternating currents: CR** circuits, LR circuits, growth and decay of currents, LCR circuit, critical damping - alternating current, relation between current and voltage in pure RC and L-vector diagrams LCR circuit power factor, series and parallel resonant circuit - Q - factor.

23. **Maxwell's equations and electromagnetic wave:** A review of basic laws of electricity and magnetism - displacement current - Maxwell's equations in differential form Maxwell's wave equation. Plane electromagnetic waves transverse nature of electromagnetic waves poynting theorem, production of electromagnetic waves (Hertz experiment)

Syllabus for Methodology - *2*: Physical Science (a) - Physics

Standard-VIII-.

Physics:
Unit-1: Our Universe
Unit-2: Measurement
Unit-3: Kinematics
Unit-4; Dynamics
Unit-5: Centre of Gravity and Stability of Bodies
Unit-6: Fluid Pressure
Unit-7: Heat
Unit-8: Waves
Unit-9: Sound
Unit-10: Light
Unit-11: Magnetism
Unit-12: Electricity
Unit-13: World of Work

Standard - IX:
Physics:

Unit-1: Our Universe
1) Introduction
2) Light Year

Unit-2: Measurement
1) Introduction
2) Measurement of Length
3) Measurement of Mass
4) Measurement of Time

Unit-3: Kinematics
1) Introduction
2) Equations of Motion

Unit-4: Dynamics
1) Introduction
2) Work
3) Power
4) Energy
5) Conservation of Energy and Transformation of Energy
6) Renewable and Nonrenewable Sources of Energy.

Unit-5: Simple Machines and Moments,
1) Introduction
2) Moment of Force
3) (i) Wheel and Axle,
 (ii) Screw Jack,
 (iii) Gears

Unit-6: Fluid Pressure
1) Introduction
2) Laws of Floatation

Unit-7; Heat
1) Introduction
2) Calorirnetry - Specific heat of Solids and Liquids
3) Calorific values of Fuels
4) Latent heat of Fusion and Latent heat of Vaporisation
5) Expansion of Solids, Liquids and Gases
6) Coefficient of Liner expansion / Superficial expansion / Cubical expansion

Unit-8: Wave motion
7) Introduction
8) Wave Motion

Unit-9: Sound
1) Introduction
2) Velocity of Sound in Gases and Solids

Unit-10: Light
1) Introduction
2) Refraction of Light through Prism
3) Splendid Colours and White Light
4) Camera and the Human Eye.
5) Microscope and Telescope

Unit-11: Magnetism
1) Introduction
2) Terrestrial Magnetism
3) Magnetic Field around a Magnet
4) Elements of Terrestrial Magnetism (Dip.,Declination).

Unit-12: Electricity
1) Introduction
2) Electrification by Friction – types of Charges
3) Gold leaf Electroscope
4) Coulomb's Inverse Square Law
5) Capacitors - Leyden Jar

Unit-13: Modern Physics
1) Introduction
2) Discharge of Electricity through Gases
3) X-Rays

Standard - X:

Physics:

Unit-1: Measurement of Length

Unit-2: Our Universe -Gravitation

Unit-3: Kinematics

Unit-4: Dynamics

Unit-5: Electromagnetic Spectrum

Unit-6: Sound

Unit-7: Light - Nature of Light and Source of Light

Unit-8: Magnetism

Unit-9: Current Electricity

Unit-10: Modern Physics

Unit-11: Electronics

CHEMISTRY:
Inorganic Chemistry

1. **Atomic Structure and Elementary Quantum Mechanics**
   Black Body radiation, Plack's Radiation law, Photoelectric effect, heat capacity of solids, Comption effect. De Broglie's hypothesis, Heisenberg's uncertainty principle, Sinusoidal wave equation, Hamiltonian operator, Schordinger's wave equation and its importance, physical interpretation of the wave function, signicationce of and ^{2}.

2. **Chemical Bonding**
   Lonic solids - lattice and salvation energy, solubility of ionic solids rule, power and oplarisability of ions, covalent nature of ionic bond covalent bond - Stereochemistry of inorganic molecules - common hybridization and shapes of molecules Molecular orbital theory - Shapes and sign convention of atomic orbital, modes of overlapping, concepts of sigma and pi bonds, criteria for forming molecular orbital from atomic orbital, LCAO - concept, types of molecular orbital - bonding, antibonding and non-bobding, electron density distribution diagram for $H_2 +$, MOED of homonuclear - H, He_2+, B_2, C_2, N_2, O_2, F_2 and their ions (unhybridised diagrams only) and heteronuclear diatomic molecules CO, $CN-$, NO, $NO-$ and HF. Bond order and magnetic properties.

3. **Periodic properties**
   Review of trends in atomic and ionic radii - covalent radii - single, double and triple bond covalent radii, van der Waal radii, radii of cations, anions iso- electronic ions, ionization energy, Electropositivity, basic nature, reducing behavior, electron affinity and electro negativity - Methods of determination and evaluation - Pauling's and Mulliken's approach, application in predicting and explaining chemical behavior - nature of bond, bond length and bond angles, diagonal relationship.

4. **s-block and p-block elements**
   Comparative study, salient feature of hydrides - ionic and covalent, ploynuclear, complex hydrides, reducing properties. Oxides - monoxide, peroxide and super oxide - basicity, oxidizing nature. Complexation tendencies.
   Comparative study of group 13-17. Hydrides - Classification - ionic, covalent, metallic and complex hydrides. Synthesis of each class of hydrides. Structure of (a) covalent hydrides, electron deficient hydrides. Diborane, decaborane. (b) complex hydrides - borohydrides. Reactivity - stability, hydrolysis and reducing properties. Oxides - Classification - a) Normal - acidic, basic amphoteric and neutral, b) mixed, c) sub oxide, d) peroxide, e) super oxide. Structure of oxides of C, N, P, S and Cl. Reactivity - thermal stability, hydrolysis. Halides - Classification - ionic, covalent and complex halides. Structure of halides of B, C, Si, N, P, S. Reactivity - stability, hydrolysis. Lewis acid nature of boron trihalides. Oxy - acids - Oxy - acids of B, C, N, P, S and Cl - structure and acidic nature. Carboranes - Nomenclature, classification - closo, niod and arachno -* preparation and structure. Borazole - Preparation, properties and structure.

   Carbomyls - Classification - mono and ploynuclear, general preparation, structure and bonding in $Ni(CO4)$, $Fe(CO)5$ and $Co_2 (CO)8$.

5. **d - block elements**
   Chemistry of elements of First Transition series - electronic configuration, metallic nature, atomic and ionic radii, ionization potential - Oxidation state - relative stability of various oxidation states, ionic and covalenet character, acidic and basic nature, oxidizing and

reducing nature of various oxidation states, redox potential - Frost and Latimer diagrams - stability, disproportionation and comproportionation of different oxidation states. Colour - d-d transition, colour and spectral behaviour of transition metal ions with respect of d1-d2 configuration. Magnetic behavior - determination of magnetic moment, Gou's balance, paramagnetism, diamagnetism. Complexation behaviour, stability of complexes - oxidation states, pi complexes, class-a, class-b and class-a/b acceptors. Catalytic properties - important examples.

Chemistry of elements of Second and Third Transition series - comparative treatment with their 3d analogues with respect to oxidation state, magnetic behavior, spectral properties. Study of Ti, Cr and Cu triads - Titanium triad - electronic configuration, reactivity of +III and +IV states - oxides, halides. Chromium triad - reactivity of +III and +VI states. Copper triad - reactivity of +I, +II, and +III states.

6. f- block elements

Chemistry of Lanthanides - electronic structure, position in periodic table, oxidation state, Atomic and ionic radii, Lanthanide contraction - cause and consequences, anomalous behaviour of post lanthanides, basicity, Complexation - type of donor ligands preferred, agnetic properties - paramagnetism. Colour and spectra - f-f transition. Occurrence and separation - ion exchange method, solvent extraction.

Chemistry of Actinides - General features - electronic configuration, oxidation state, actinide contraction, and colour and complex formation. Comparison with lanthanides.

7. Metals

Theories of bonding in metals - Free electron theory - thermal and electrical conductivity of metals, drawbacks. Valence bond theory - explanation of metallic properties and its limitations. Band theory - explanation of metallic properties, conductors, semi conductors and insulators. General methods involved in extraction of metals - minerals and ores, ore concentration - electromagnetic separation, gravity separation - wilfley table, hydraulic classifier, leaching, froth flotation, Calcination and roasting. Acid and alkali digestion. Reduction of oxides, carbonates, halides, sulphides, sulphates - smelting, flux, auro reduction, alumino - thermic reduction, hydrometallurgy, electrolytic reduction. Purification of impure metals - liquation, fractional distillation, zone refining, oxidative processes - cupellation, bassemerisation, puddling, poling, thermal decomposition, Amalgamation, Electrolysis. Alloys - Classification, substitutional solid solutions, interstitial solid solutions, intermetallic compounds,

Hume - Rothery rules. Preparation of alloys - fusion, electro deposition, reduction and compression Uses ferrous and non-ferrous alloys.

8. Co-ordination compounds

Nomenclature of inorganic molecules and complex compounds - A. Simple inorganic molecules - multiplying affixes, structural affixes (i) cations - monatomic homopolyatomic, (ii) anions - monoatomic, homopolyatomic, heteropolyatomic (iii) radicals (iv) isopolyanions (v) heteropolyanions (vi) salts and salt like compound (vii) addition compounds. B. Complex compounds - Werner's theory - postulates, experimental evidences. Sidwick's theory - calculation of BAN, limitations. Metai Ligand bonding in Transition metal complexes - Valence bond theory - postulates, geometries of coordination number 4 - tetra hedral and square planer and 6 - octahedral. Limitations. Crystal field theory - features,

splitting of d - orbitals in octahedral, tetrahedral and square planar complexes, crystal field stabilization energy, (elementary treatment -diagrams only). Magnetic properties of Transition metal complexes. Types of magnetic behavior, spin only formula, calculation of magnetic moments. Electronic spectra of metal complexes - d-d transitions, spectrochemical series. Determination of composition of complexes, Job's method and

mole ratio method, Stability constants, factors affecting stability of complexes. Isomerism in co-ordination compounds - Structural - ionization, hydrate, linkage, coordination, coordination position and polymerization isomerism. Stereoisomerisms - geometrical and optical isomerism.

Hard and soft acids and bases
Classification, Pearson's concept of hardness and softness, application of HSAB principles - stability of complexes, predicting the feasibility of a reaction.

Organic Chemistry:

9. **Stereochemistry of carbon compounds**
Molecular representations: Wedge, Fischer, Newman and Saw-horse formulae. Isomeris: Definition of homomers and isomers. Classification of isomers; Constitutional and Stereosiomers - definition and examples. Constitutional isomers: chain, functional, positional isomers and metarerism. Stereoisomers: enantiomers and diastereomers - definitions and examples. Conformational and Configurational isomerism - definition.

Structural theory in Organic Chemistry
Brief review of structural theory of organic chemistry, Hybridization, Bond length, bond angle, bond energy, curved arrow notation, drawing electron movements with half headed and double headed arrow. Types of bond fission and organic reagents (Electrophilic, Nucleophilic, and free radical reagents including neutral molecules like HO_2, BF_2, NH_33& $AICI_3$.

Bond polarization: Factors influencing the polarization of covalent bonds, electro negativity - inductive effect. Application of inductive effect, (a) Basicity of amines (b) Acidity carboxylic acids (c) Stability carbonim ions. Resonace or Mesomere effect, application to (a) acidity phenol, (b) acidity of carboxylic
acides. Hyper conjugation and its application to stability to stability of carbonium ions, Free radicals and alkenes.
Types of organic reactions: Addition - electrophilic, nucleophilic and free radical. Substitution - electrophilic, nucleophilic and free radicium. Elimination - Examples (mechanism not required).

11. **Acyclic Hydrocarbons**
Alkanes - IUPAC Nomenclature of Hydrocarbons. Method of preparation: Hydrogenation of alkynes and alkenes, Wurtz reaction, Keibe's electrolysis, Corey-House reaction. Chemical reativity - inert nature, free radical substitution mechanism. Halogenation examples - reactivity, selectivity and orientation. Conformational analysis of ethane and n-butance.
Alkene - Preparation of alkenes (a) by dehydration of alcohols (b) dehydrohalogenation of alkyl halides (c) by dehalogenation of 1, 2 dihalides (brief mechanism), Zaitsev's rule. Properties: Addition of Hydrogen - heat of hydrogenation and stability of alkenes. Addition of halogen and its mechanism. Adition of HX, Markonikov's rule, addition of H2O' HOX, $H2SO_4$
with mechanism and addition of HBr in the presence of peroxide (anti - Markonikv's addition).
Oxidation - hydroxylation by KMnO4, OSO4
Peracids (Via epoxidation), nydroboration, ozonolysis - location of double bond. Dienes - Types of dienes, reactions of conjugated dienes- 1, 2 and 1, 4 addition of HBr to 1,3-butadiene and Diel's - Alder reaction.
Alkynes - Preparation by dehydrohalogenation of dihalides, dehalogenation of tetrahalides acetylene from CaC

Properties: Acidity of acetylenic hydrogen (formation of metal acetylides). Preparation of higher acetylenes, metal- ammonia reductions. Physical properties. Chemical reactivity - electrophilic addition of X_2 HX, H2O (taoutomerism), Oxidation (formation of enediol, 1, 2 diones and carboxylic acids), reduction and polymerization reaction of acetylene.

12   Benzene and its reactivity

Molecular formula of Benzene, structure of Benzene - open chain structure not possible, proposition of cyclic structure by kekule, dynamic equilibrium, evidence based on ozonolysis experiment, concept of resonance, resonance energy. Heat of hydrogenadon, heat of combustion of Benzene, mention of C-C bond lengths and orbital picture of Benzene.

Concept of aromaticity - aromaticity (definition), Huckl's rule - application to Benzenoid (Benzene, Napthalene, Anthracene and Phenanthrace) and Non- Benzenoi compounds (cyclopropenyl cation, cyclopentadienyl anion and tropylium cation).

Reactions General mechanism of electrophilic substitution mechanism of nitration and sulfonation. Mechanism of halogenatton, Friedel craft's alkylation and acylation. Orientation of aromatic substitution - Definition ortho, para and meta directing groups. Ring activating and deactivating group with examples (Electronic Interpretation of various groups like NO2 and Phenolic). Orientation: (i) Amino methoxy and methyl groups, (ii) Carboxy, nitro mitrile, carbonyl and sulfonic acid groups, (iii) Halogens (Explanation by taking minimum of one example from each type).

13   Areness and polynuclear aromatic hydrocarbons

Polynuclear hydrocarbons - Structure of naphthalene and anthracene (Molecular Orbital diagram and resonance energy) Reactivity towards electrophilic
substitution. Nitration and sulfonation as examples.

Hydroxy compounds

Nomenclature and classification of hydroxyl compounds. Preparation: from carbonyl compounds. Aryl carbinols by hydroxyl methylation. Phenols - (a) by diazotization (b) from sulfonic acid (c) from cumene (d) by hydrolysis of halobenzene. Physical properties - Hydrogen bonding (inter molecular and intramolecular) effect of hydrogen bonding on boiling point and water solubility Chemical properties (a) acidic nature of Phenols (b) Formation of aloxide/phenoxides and their reaction with RX (c) replacement of OH by X using PCI, PBr3, SOCI2 and with HX/$ZnCl_2$. Esterification by (a) acid halides, anhydrides and acids (mechanism) (b) Esters of inorganic acids (c) dehydration of alcohols. Oxidation of alcohols by CrO3l $KMnO_4$. Special reactions of phenols - (a) Bromination, (b) Kolbe - Schmidt reaction (c) Riemer Tiemann (d) Azo coupling. Identification of alcohols by oxidation - KmnO4, Ceric ammonium nitrate - Lucas reagent; Phenols by reaction with FeCIs, and by the solubility in NaOH. Polyhydroxyl compounds - Pinacol - Pinacolone rearrangement, Oxidative cleavage ($Pb(OAc)_4$ & HIO_4).

Carbonyl compounds

Nomemclature of aliphatic and aromatic carbonyl compounds and isomerism. Synthesis of aldehydes & ketones from acid chloride by using 1,3-dithianes, nitriles and from carboxylic acids. Base catalysed reactions - with particular emphasis on Aldol, Cannizaro reaction, Perkin reaction, Benzoin condensation, haloform reaction, Knoevengeal condensation. Oxidation reactions - KMnO4
oxidation and auto oxidation, reduction - catalytic hydrogenation, Clemmenson's reduction, Wolf-kishner reduction, MPV reduction, reduction with LAH, NaBH
. Analysis - 2,4 - DNP test, Tollen's test, Fechlings test, Scihffs test, haloform test (with equations). Introduction to ap-unsaturated carbonyl compounds.

Nitrogen compounds

Nitro hydro carbons: Nomenclature and classification - nitro hydrocarbons - structure. Tautomerism of nitroalkanes leading to acid and keto form. Preparation on Nitroalkanes. Reactivity - halogenation, reaction with HONO (Nitrous acid), Nef reaction and Mannich reaction leading to Michael addition and reduction. Aromatic Nitro hydrocarbons: Nomenclature, Preparation of Nitrobenzene by Nitration (mechanism), from diazonium salts. Physical properties, chemical reactivity - orientation of electrophilic substitution on nitrobenzene. Reduction reaction of Nitrobenzenes in different media. Amines (Aliphatic and Aromatic): Nomenclature, classification into 1°, 2°, 3° Amines and Quaternary ammonium compounds. Preparative methods - 1. Ammonolysis of alkyl halides 2. Gabriel synthesis 3. Hoffman's bromamide reaction (mechamism). Reduction of Amides and Schmidt reraction.

Chemical Properties: (a) Alkylation (b) Acylation (c) Carbylamine reaction (d) Hinsberg separation. 5. Reaction with Nitrous acid of 1°, 2°, 3° (Aliphatic and aromatic amines). Electophilic substitutions of Aromatic amines - Bromination and Nitration, oxidation of aryl and 3° Amines, diazotization. 6. Diazonium salts: Preparation with mechanism. Synthetic importance - (a) Replacement of diazonium group by - OH, X (Cl) - Sandmeyer and Gatterman reaction, by fluorine (Schiemann's reaction), by iodine, CN, NO_2, H and aryl groups. Coupling Reraction of diazonium. (i) with phenols (ii) with anilines. Reduction to phenyl hydrazines.

14   Heterocyclic Compounds

Introduction and definition: Simple 5 membered ring Compounds with one hetero atom Ex. Furan, Thiophene and pyrrole. Importance of ring systems - presence in important Natural products like hemoglobin and chlorophyll. Numbering the ring systems as per Greek letters and Numbers. Aromatic character - 6- electron system (Four - electrons from two double bonds and a pair of non bonded electrons from the hetero-atom). Tendency to undergo substitution reactions.

15   Carbohydrates

Introduction: Classification and nomenclature - classification into mono, oligo and polysacchrides into pentoses, hexoses etc. into aldoeses and ketoses.

Monosaccharides: All discussion to be confined to (+) glucose as an example of aldo hexoses and (-) fructose as example of ketohexoses. Chemical properties and structural elucidation: Evidences for straight chain pentahydroxy aldehyde structure (Acetylation, reducation to n- hexane, cyanohydrin formation, reduction of Tollen's and Fehling's reagents and oxidation to gluconic and saccharic acids). Number of optically active, isomers possible for the structure, configuration of glucose based on D-glyceraldehydes as primary standard (No proof for configuration is required). Evidence for cyclic structure of glucose (some negative aldehyde tests

and mutarotation). Cyclic structure of glucose: Proposition of cyclic structure (Pyranose structure, anomeric Carbon and anomers). Proof for the ring size (methylaltion, hydrolysis oxidation reactions). Different ways of writing pyranose structure (Haworth formula and chair conformational formula). Structure of fructose: Evidence of 2 - ketohexose structure (formation of penta acetate, formation of cyanohydrin its hydrolysis and reduction by HI to give 2-Carboxy-n-hexane Same osazone formation from glucose and fructose, Hydrogen bonding in osazones, cyclic structure for fructose (Furanose structure and Haworth formula). Inter Conversion of Monosaccharides: Aldopentose to aldo hexose - eg: Arabinose to D-glucose, D-mannose (kiliani - Fischer method). Epimers,Epimerisation. Lobry debruyn van Ekenstein rearrangement. Aldohexose - Aldopentose eg: D-g!ucose to

D-arabinose by Ruff's degradation. Aldohexose (+) (glucose) to ketohexose (-) (fructose) and Ketochexose (Fructose) to aldohexose (Glucose).

16   Amino acids and proteins
Introduction: Definition of Amino Acids, classification of Amino acids into alpha, beta and gama amino acids. Natural and essential amino acids - definition and examples, classification of alpha amino acids into acidic, basic and neutral amino acids with examples. Methods of synthesis: General methods of syntheis of alpha amino acids (specific examples - Glycine, Alanine, valine and Leucene) by following methods: (a) From halogenated Carboxylic acid (b) Malonic ester synthesis (c) strecker's synthesis. Physical properties: Optical activity of naturally occurring amino acids: L -configuration, irrespective of sign of rotation. Zwitter ion structure - salt like character, solubility, melting points, amphoteric character, definition of isoelectric point. Chemical properties: General reactions reactions due to amino and carboxyl groups - Lactams from gamma and delta amino acids by heating peptide bond (amide linkage). Structure and nomenclature of peptides and proteins, peptide synthesis.

Physical Chemistry:
17   Gaseous state
Deviation of real gases from ideal behavior, Vanderwaal's equation of state. Critical Prenomena: PV - isotherms of real gases, continuity of state, Andhrew's isolthems of carbon dioxide. The vander waals equation and the critical state, Derivation of relationship between critical constants and Vander waal's constants. Experimental determination critical constants. The law of corresponding states, reduced education of state. Joule-Thomson effect and inversion temperature of a gas. Liquid action of gases: i) Linde's method bases on Joule-Thomson effect, ii) Claude's method based on Adiabatic expansion of a gas.

18   Liquid state
Intermoie alar forces, structure of liquids (qualitative description). Structural different between solids, liquids and gases. Liquid crystals, the mesomorphic state: classification of liquid crystals into Semectic and Nematic, differences between liquid crystal and solid/liquid. Application of liquid crystals as LCD devices, lubricants and in digestion/assimilation of food.

19   Solid state:
Laws of Crystallography - (i) Law of Constancy of interfacial angles (ii) Law of Symmetry, symmentry elements in crystals (iii) Law of rationality of indices. Definition of space lattice, unit cell.   Bravais Lattices and Seven crystal systems. Structure of NaCl (Bragg's method and Powder method).   Defects in crystals: Stoichiometric and Non-stoichiometric defects. Band theory of Semiconductors: Extrinsic and Intrinsic semi conductors, n-type and p-type and their applications in photo electro chemical cells.

20   Dilute Solutions and Colligative properties
Dilute solutions, colligative properties, ideal and non-ideal solution. Raoult's law, relative lowering of vapor pressure, molecular weight determination. Osmosis laws of somotic pressure, its measurement, determination of molecular weight from osmotic pressure. Elevation of boiling point and depression of freezing point. Derivation of relation between molecular weight and elevation in boiling point and depression in freezing point. Experimental methods for determing various colligative properties. Abnormal molar mass, Van't Hoff factor, degree of dissociation and association of solutes.

21   Colloids and Surface Chemistry
Definition of colloids, classification of colloids. Solids in liquids (sols): Preparation and properties - kinetic, optical and electrical: stability of colloids, protective action, Hardy-Schultz law, gold number. Liquids in liquids (emulsions): types of emulsions, preparation and emulsifier. Liquids in solids (gels) classification, preparation and properties, inhibition, general applications of colloids.

22   Solutions
Liquid - liquid mixtures - ideal liquid mixtures, Raoult's and Henry's law. Non- ideal systems. Axeotropes - $HCl-H_2O$, ethanol-water systems. Fractional distillation. Partially miscible liquids - phenol-water, trimethyl amine-water, nicotine-water systems, Lower and upper consolute temperature. Effect of impurity on consolute temperature. Immiscible liquids and steam distillation.

23   Chemical Kinetics
Rate of a reaction, factors influencing the rate of a reaction - concentration, temperature, pressure, solvent, light and catalyst. Concentration dependence of rates, mathematical characteristics of simple chemical reactions - Zero order, first order, second order, pseudo first order, half-life and mean life. Determination of order of a reaction - differential method, method of integration, half-life method and isolation method. Radioactive decay as first order phenomenon. Arrhenius equation, and concept of activation energy. Theories of chemical kinetics: effect of temperature on rate of a reaction Simple collision theory based on hard sphere model.

24   Thermodynamics
Definition of thermodynamic terms: System, surroundings, types of systems, and intensive and extensive properties. State and path functions and their differentials. Thermodynamic process. Concept of heat and work.
First law of Thermodynamics: Statement, definition of internal energy and enthalpy. Heat capacity, heat capacities at constant volume and pressure and their relationship. Joule's law - Joule. Thomson coefficient and inversion temperature. Calculation of w,q, dU and dH for the expansion of ideal gases under isothermal and adiabatic conditions for reversible process. Temperature dependence of enthalpy - Kirchoff s equation. Second law of Thermodynamic: need for the law, different statements of the law. Carnot cycle and its efficiency, Carnot Theorem. Thermodynamic scale of temperature. Concept of entropy, entropy as a state function, entropy as a function of V & T, entropy as a function of P & T, entropy change in physical processes. Gibbs and Helmholtz functions: Gibbs function (G) and Helmholtz function (A) as thermodynamic quantities. A & G as criteria for thermodynamic equilibrium and spontaneity, their advantage over entropy change. Variation of G with P, V and T.

Syllabus for Methodology - 2: Physical Sciences (b) Chemistry:

Standard-VIII:
Chemistry:
Unit-1: Action of Heat on Substances

Unit-2: Symbols, Formulae and Equations

Unit-3: Types of Chemical Changes

Unit-4: Laws of Chemical Combination

Unit-5: Water and its Constituents

Unit-6: Sulphur and its Compounds

Unit-7: Nitrogen and its Compounds

Unit-8: Phosphorus and its Compounds

Unit-9: Common Salt and its Constituents.

Standard - IX:
Chemistry:
Unit-1: Behaviour of Gases
1) Measurable Properties of Gas
2) More about the Properties of Gas

Unit-2: Atomic Structure
1) Matter - Its Structure
2) Cathode **Rays** (Electrons)
3) **Canal** Rays (Protons)
4) Discovery of Neutron
5) Atomic Models - Arrangement of Subatomic Particles

Unit-3: Chemical Bonding
1) Why do atoms combine /
2) How do they combine?
3) Types of Bonds
4) Intermolecular Attractions

Unit-4: Energetic
1). Energy changes during a Chemical Reaction
2) Exothermic and Endothermic Reactions
3) Why are chemical reactions Exothermic and Endothermic?

Unit-5: Chemical Calculations
1) Meaning of Chemical Equations
2) Thermo chemical Equations
3) Problems Based on Equations.

Unit-6: Rate of Reactions
1) Slow and Fast Reactions
2) Rate f Reaction
3) Factors Affecting the Reaction Rate – Nature of Reactants
4) Effect of Concentration of Rate of a Reaction
5) Effect of Catalyst on the Rate of a Reaction
6) Effect of Temperature on the Rate of a Reaction
7) Reversible and Irreversible Reactions

Unit-7: Metallurgy
1) Occurrence and Relative Abundance of Metals in Earth's Crust
2) General Principles of Metallurgy Occurrence and Relative Abundance of Metals in Earth's Crusty
3) The Metallurgy of Iron
4) Protection of Metals and Prevention of Corrosion.

Standard-X:

Chemistry:
1) Atomic Structure
2) Chemical Bond
3) Periodic **Classification o** Elements
4) Alkaline Earth Metals
5) Solutions
6) Acids, Bases and Salts
7) Chemistry of Carbon Compounds
8) Carbohydrates and Proteins
9) Oils and Fats
10) Chemistry and Industry.

3. BIOLOGICAL SCIENCE METHODOLOGY

BOTANY:

A) 1. **Branches of Botany:**
Virology, Phycology, Mycology, Lichenology, Bryology, Pteridology, Palaeobotany, Histology, Anatomy, Physiology, Pathology, Ecology, Taxonomy, Embryology, Cell Biology, Genetics, Evolution, Biotechnology, Microbiology.

B) **Classification of Plant Kingdom:**
2. Classification of plant kingdom and salient features of major groups (Algae, Fungi, Bryophyta, Pteridophyta, Gymnosperms & Angiosperms)
3. Bentham & Hooker's and Engler & Prantle's systems of classifications ; Plant diversity in Angiosperm families - Annonaceae, Malvaceae, Capparidaceae, Rutaceae, Fabaceae, Caesalpiniaceae, Mimosaceae, Cucurbitaceae, Apiaceae, Rubiaceae, Asteraceae, Sapotaceae, Asclepiadaceae Convolvulaceae, Acanthaceae, Lamiaceae, Amarantaceae, Euphorbiaceae, Orchidaceae, Liliaceae, Palmae and Poaceae.

C) **Microbiology:**
4. Structure, replication and transmission of viruses and Mycoplasma ; Diseases caused by viruses in plants and humans.
5. Structure, nutrition and reproduction of bacteria ; useful bacteria , bacterial diseases of plants and Humans.
6. Structure, reproduction, life history and systematic position of *Volcvox, Oedogonium,Chara, Vaucheria, Ectocarpus,* and *Polysiphonia* ; General account of Bacillariophyceae & Economic importance of algae.
7. Structure, reproduction, life history and systematic position of *Albugo, Mucor, Pencillium, Peziza, Puccinia,* and *Alternaria -* plant diseases caused by *Albugo, Puccinia* and *Alternaria*
8. Structure, reproduction and economic importance of lichens.

D) **Cell Biology:**
9. Prokaryotic and eukaryotic cells; structures and functions of cell organelles. 10. Cell division - mitosis and meiosis

E) **Tissue organization and growth :**
11. Tissues and tissue systems in plants ; Histological organization of apical meristems;Stellar evolution in Pteridophytes;
12. Primary structure and secondary growth in roots and stems of dicots and monocots; abnormal secondary growth ; internal structure of dicot and monocot leaves in relation to photosynthesis and water stress.

F) **Physiology:**
13. Water relations of plants: Importance of water to plants; physical properties of water; Diffusion and Osmosis; Absorption and transport of water; Transpiration - physiology of stomata.
14. Nutrition in plants: Autotrophism, heterotrophism and types ; Absorption of mineral elements by plants ; essential macro and micro elements and their role.
15. Photosynthesis: Mechanisms and regulating factors. 16. Nitrogen metabolism: Biology of nitrogen fixation; importance of nitrate reductase and regulation; ammonium assimilation ; Protein synthesis; ID, 2D and 3D structure of proteins.
17. Lipid metabolism: Saturated and unsaturated fatty acids; fatty acid biosynthesis; 6 - oxidation.

18. Growth and differentiation: Seed germination and dormancy- influencing factors; kinetics of growth; plant hormones and mechanisms of action ; phytochromes and their role ; fruit development and ripening.
19. Respiration: types, mechanism and controlling factors.

G)   Plant reproduction:
20. Types of reproduction -- vegetative, asexual and sexual ; evolution of sporophyte in Bryophytes ; Heterospory and seed habit in Pteridophytes.
21. Flower as a modified shoot; pollen-pistil interaction ; self incompatibility. 22. Microsporogenesis ; Megasporogenesis -Types of embryosacs; development of Mono-, bi- and tetrasporic types. 23. Endosperm types and development. 24. Development of dicot and monocot embryos; polyembryony.

H)   Plant resources and their utilization:
25. Rice, wheat maize, potato, sugarcane, cotton, jute, G'nut, mustard, coconut, Teak, rosewood, sandalwood, *Terminalia catapa,* tea, coffee, rubber, spices and medicinal plants.

I)   Plants and Environment:
26. Atmosphere (gaseous composition), water (properties of water cycle), light (global radiation & photosynthetically active radiation), temperature, soil (soil profile, physico- chemical properties), and biota.
27. Morphological, anatomical and physiological responses of plants to water (Hydrophytes & Xerophytes), temperature (Thermoperiodicity & Vernalization), light (Photoperiodism, Heliophytes, Sciophytes), and salinity.

Syllabus for Methodology - 3: Biological Sciences (a) Botany

Standard-VIII:

Unit-1: History and Scope of Science

1) Role of Life Sciences in Daily Life and Its Contributions to Human Welfare
2) Contributions of Different Scientists of Our Understanding of Biology
3) Important Institutes of Science in the Country
4) Biology and Its Relation to Other Branches of Science and Different   Branches of Biology
5) Branches of Biology
6) Classification of Plants and Animals.

Unit-2: Microbial World

1) Microorganism - Forms and Kinds
2) Useful Microorganisms
3) Harmful Microorganisms

   (a) Plant Diseases (b) Viral Diseases (c)Bacterial Diseases in Man

4) Modes of Transmission and Spread of Disease Causing Organisms
5) Prevention and Control of Diseases 6) Storage and Preservation of Food.

Unit-3: Useful Plants and Animals

1) Wild and Cultivated Plants
   (i) Relationship between Wild and Cultivated Plants
   (ii) Transfer of Desirable Traits in Plants
2) Economic Importance of Plants

Unit-4: Agriculture and Animal Husbandry.

1) Agricultural Operations
2) Crop Diseases and Pest Control Measures

Standard - IX:

Unit-1: Organisation of Life

1} Living Organisms show Organisation
2} Cell-The Structural and Functional Unit 3) Plants and Animal Cells Differ in their Structure
4) Cell division - Mitosis and Meiosis
5) Growth and Differentiation
6) Cells Organise to form Tissues

Unit-2: Life Processes
1) Autotrophic, Heterotrophic and Mixotrophic Nutrition
2) Uptake of Water and Salts by Plants
3) Diffusion, Osmosis
4) Transport of Water and Salts in Plants

Unit-3: Natural Resources
1) Classification and judicial use of Available Resources Classification and judicial use of Available Resources
2) Non-Renewable and Alternative Resources

Unit-4: World of Energy
1) Work and Energy
2) Energy Transformations
3) Need for Energy in Living Organisms
4) Basal Metabolic Rate (BMR)
5) Energy relations in Ecosystems
6) Biomassas Biofuels
7) Non-Conventional Energy Sources

Unlt-5: Organisms. Habitat and Ecological Balance
1) Habitat and Microhabitat
2) Land and Water as Habitats and Adaptations
3) Biosphere
4) Pollution

Unit-6: Agriculture and Animal Husbandry
1) Crop Improvement
2) Care and Management of Poultry
3) Agmark: Government Certified Food Quality Mark.

Standard-X:

Unit-1 j Life Processes

1) Photosynthesis as a Life Process Photosynthesis as a Life Process
2) Factors Related in Photosynthesis
3) Mechanism of Photosynthesis
4) Respiration
5) Types of Respiration
6) Importance of Respiration
7) Cellular Respiration
8) Factors, Controlling Respiration

Unit-2: Control and Coordination

1) Chemical Coordination in Plants

Unit-3: Reproduction

1) Reproduction in Plants
2) Sexual Reproduction in Plants.

ZOOLOGY:

Biology of Invertebrates and Cell Biology
1. General characters and classification of Major Invertebrate phyla with examples upto orders,
2. Protozoa: (i) Polystomella - type study, (ii) Trypansoma life cycle only
3. Porifera : Canal system, Histology & Spicules.
4. Coelentereta: (i) obelia type study, (ii) Polymorphism in Siphonophora, (iii) Corals and Coral reef formation.
5. Helminthes - Fasciola - Detailed type Study.
6. Annelida: (i) Metamerism - (ii) Comparative study of the following systems of Leach and Nereis - External Characters - Digestive system - Reproductive system - Coelom and Coelomoducts,
7. Arthopoda: Comparitive study of Palasmon and Scorpion with reference to External features, appendages, Respiration, Circulation Excretion. Peripastus : Structure and affinities.
8. Mollusca : (i) Comparative study of Pila & Fresh water Mussel : External characters, Shell, Mantle complex and foot. (ii) Pearl formation (iii) Torsion in Gastropoda.
9. Echinodermata: Starfish - detailed study.
10. Hemachordata : Balanoglossus - External Features, Tornaria larva – Affinities of Hemichoradata.
11. Important Invertebrate larval forms: (a) Amphiblastula, (b) Ephyra larva, (c) Trochophore, (d) Nauplius, Zoea, Mysis, (e) Veliger, Glochidium, (f) Echinopluteus, Ophiopluteus, Auricularia and Doliolaria.
12. Ultra structure of Animal Cell: Cell Division, Mitosis and Meiosis.
13. Structure and function of the following cell orgtanelles: (i) Plasma Membrane: Membrane, Transport of small molecules, Cell Junctions, Cell adhesion, (ii) Cytoskeleton, (iii) Golgi Complex, (iv) Lysosomes, (v) Role of mitochondria in cellular energy, transactions, (vi) Chromosomes - Structure and type, Salivary gland chromosomes.

Animal Phsiology, Behaviour and Ecology Animal Physiology pertaining to:
1. Nutrition: Types of nutrition in animals, autotrophic - Heterotrophic, vitamins and minerals.
2. Digestion in Mammals 3. Respiration: Brief account of types of respiratory mechanism, respiratorypigments, gas transport with reference to mammals. 4. Circulation: Composition and functions of blood, co-agulation of blood; Myogenic and Neurogenic hearts, mammalian heart - structure and function, Blood pressure and its role and exchange of materials in capillaries,
5. Osmo-regulation: Pertaining to aquatic animals only.
6. Excretion: (i) Classification of animals based on end products of excretion, (2) Formation of nitrogen waste. (3) Nephron: Structure and Function.
7. Nervous transmission: Structure of neuron, action-potential, production and propagation of nerve impulse and synaptic transmission.
8. Muscle contraction.
9. Endocrine glands of Mammals: Pineal body, Hypophysis, Hypothalamus, Thyroid, Parathyroid, Thymus, Adrenal Gastro intestinal, Pancreas, Testis and ovary.
10. Hormonal control of reproduction in mammals.
11. Concept of Homeostasis.

Animal Behaviour

Taxis, reflexes, instinctive behaviour, motivatived behaviour, learning, imprinting, habituation, classical conditioning, instrumental conditioning trial and error learning, physiology and phylogeny of learning, biological rhythms - circadian, lunar and circannual rhythms.

Animal Ecology

1. Physico-chemical factors of the animal Environment: Temperature, light, pressure, atmospheric gass i.e.; oxygen and carbon dioxide; Biogeochemical cycles: nitrogen, carbon and phosphorus cycles.

2. Animal community and Animal population: Ecosystems (Ecological succession, Ecological pyramids, energy flow in an eco system) - Animal associations: Parasitism, Commensalism, Symbiosis ; Environments and adaptive features of animals inhabiting / deep sea, cave, and desert.

3. Environmental pollution.

4. Wild life, wild life sanctuaries and national parks of India.

Biology of Chordates, Genetics, Evolution and Zoogeography

1. General characters and outline classification upto the level of order.

2. Protochordata: (a) Structure and Affinities of Amphioxus; (b) Structure Life history of an Ascidian.

3. Cyclostomata: General characters of cyclostomes and differences between Myxin & Petromyzon.

4. Comparative study of the following systems with reference to Scoliodon (pisces), Rana (Amphibia) calotes (Reptilia), Columba (Aves) and Lagomorpha (Mammalian) - (a) Skeletal system: Heart and aortic arches; (d) Nervous system - Brain.

5. General Topics: (i) Parental care in Amphibia; (ii) Dentition in Mammals. 6. Developmental Biology: (i) Gastrulation in amphioxus, Frog andChick; (ii) Development of chick upto 24 hrs., (iii) Foetal membrances of chick, (iv) Placenta in Mammals (Formation and types).

Genetics:
1. Gene interaction with 3 examples
2. Sex determination.
3. Sex linked inheritance
4. Blood group inheritance
5. Fine structure of gene, Operon/ concept, Cloning, Lethal genes
6. Chromosomal Aberration and human diseases. Evolution and Zoogeography.
   1. Modern synthetic theory of Evolution, Mutations, Genetic basis of Evolution, Genetic Drift (Hardy Weinberg's Law), Isolation and speciation.
   2. Characteristics of the following Zoogeographic regions and their fauna: (i) Oriental regions, (ii) Ethiopian Region, (iii) Australian Region.

Syllabus for Methodology - 3: Biological Sciences(b) - Zoology

Standard-VIII: Unit-1: History and Scope of Science

1) Role of Life Sciences in Daily Life and Its Contributions to Human Welfare
2) Contributions of Different Scientists of Our Understanding of Biology
3) Important Institutes of Science in the Country
4) Biology and Its Relation to Other Branches of Science and Different Branches of Biology
5) Branches of Biology
6) Classification of Plants and Animals.

Unit-2: Microbial World

1) Microorganism-Forms and Kinds
2) Useful Microorganisms
3) Harmful Microorganisms

   (a) Plant Diseases
   (b) Viral Diseases
   (c)Bacterial Diseases in Man

4) Modes of Transmission and Spread of Disease Causing Organisms
5) Prevention and Control of Diseases
6) Storage and Preservation of Food.

Unit-3: Useful Plants and Animals

1) Wild and Domesticated Animals.
2) Economic Importance of Animals

Unit-4: The Human Body and Health

1) Sense Organs
(a) Eye, (b) Ear, (c) Nose

(d) Sense of Taste - Tongue
(e) Skin

2) Common Ailments of Skin
3) First - Aid

Unit-5: Agriculture and Animal Husbandry.

1) Pisciculture (Fish Farming)
2) Breeding of Cows and Buffaloes

Standard - IX: Unit-1: Organisation of Life

1) Living Organisms show

2) Cell is The Structural and Functional Unit 3) Plants and Animal Cells Differ in their Structure 4) Cell division - Mitosis and Meiosis 5) Growth and Differentiation 6) Cells Organise to form Tissues

Unit-2: Life Processes

1} Autotrophic, Heterotrophic and Mixotrophic Nutrition
2) Uptake of Water and Salts by Plants
3) Diffusion, Osmosis
4) Nutrition in Animals
5) Need for Digestion and Digestive Enzymes
6) Digestion in Ruminants
7) Human Digestive System
8) Excretion.

Standard-X: Unit-1: Life Processes

1) Organs of Respiration in Animals

2) Comparison of Photosynthesis and Respiration 3) Transport Systems 4) Structure and Function of Human Heart 5) Blood and its Components 6) Blood Groups and

Importance of Blood Donation

Unit-2: Control and Coordination

1) Chemical Coordination in Animals 2) Human Nervous System

Unit-3: Reproduction
1) Sexual Reproduction in Animals
2) Human Reproductive System

Unit-4: HIV-AIDS

Unit-5: Nutrition
1) Nutritional Requirements
2) Deficiency Diseases
3) Tropical Diseases
4) First Aid for Some Common Accidents
5) Health Agencies
6) Eradication of Blindness

4. SOCIAL STUDIES METHODOLOGY

GEOGRAPHY:

I.   **Principles of Physical Geography:**
     Interior of the Earth. Major relief features of the Earth; Mountains, plateaus and plains. Wegner's theory of continual drift, theory of Isostacy, Earthquakes and Volcanoes. Chief types of rocks and their charactestics. Weathering and Erosion. Landforms in Fluvial, Arid, Karst, Glacial and Marine cycles. Structure and composition of the atmosphere. Distribution of temperature-vertical and horizontal; temperature inversion. Pressure Belts and Planetary wind systems, Monsoons & Local winds, Precipitation, types of rainfall, Cyclones and anticyclones-tropical and temperature cyclones-an outline of Koppen's classification of climates. Submarine relief - Distribution of temperature and salinity - Movements of Ocean water: Waves, Tides and Currents - Currents of the Pacific, the Atlantic and the Indian ocean - Ocean deposits.

II. **Social and Economic Geography:**
     Definition, scope and objectives of Economic Geography Physical Environment and Human activities Concept of Resources, Types of resources,Conservation and management of resources - Distribution, Pattern and growth trends of population in the world-Type of settlements. Urban and Rural Trends in Urban growth - Agriculture: Distribution of Rice, Wheat Tea, Coffee, Cotton and Sugarcane - Distribution of major forest types, major fishing grounds of the world - Mineral and power resources : Iron, Bauxite, Coal & Petroleum - Weber's theory of industrial location - Location and distribution of Iron and Steel, Cotton Textiles.

III. **Regional Geography of India:**
     Locational aspects, Major Physiographic regions, climate, drainage, soil types and natural vegetation - pattern and growth trends of population, urbanization - Agriculture: Rice, Wheat, Cotton, Jute, Sugarcane, Tea and Coffee - irrigation and power development in India - Minerals : Iron, coal and petroleum - Composition and pattern of trade - Resource appraisal of Telangana, Rayalaseema and Coastal Andhra.

IV. **Regional Geography of Asia:**
     Scope and content of Regiona Geography - location, Relief, Drainage, Climate, Natural Vegetation, Agriculture. Types mineral wealth firon,tin, coal and oil); Industrial development, industries (shipbuilding, petrochemicals, automobiles); Population distribution; Broad outlines of the following as regions: South East Asia : Thailand, Malaysia, Indonesia - South West Asia : Iran, Iraq, Afganisthan.

Syllabus for Methodology - 4: Social Sciences (a) Geography

Standard-VIII:

Geography:
Unit-1: Physical Geography
1} The Solar System and the Earth
2) The Movements of the Earth and their effects
3) Interior of the Earth
4) Latitudes and Longitudes
5) Eclipses

Unit-2: Antarctica

Unit-3: Geography of Andhra Pradesh.
1) Physical Regions and Rivers
2) Climate of Andhra Pradesh
3) Floods and Droughts
4) Forests
5) Animal Wealth
6) Soils
7) Soil Erosion
8) Electricity
9) Agriculture, Food Crops, Cash Crops, Oil Seeds, Horticulture
10) Mineral Wealth
11) Industries
12) Population

Standard - IX:

Geography:
Unit-1: Solar Energy and Insolation

Unit-2: Temperature
1) The Horisontal Distribution of Temperature
2) The Vertical Distribution of Temperature
3) The World Distribution of Temperature

Unit-3: Elements of Climate
1) Planetary Winds
2) Humidity and Precipitation

Unit-4: Movements of the Earth's crust
1) Earthquakes
2) Volcanoes

Unit-5: The Oceans

Unit-6: The Major Natural Regions of the World
1) The Equatorial Region
2) The Tropical / Hot Deserts
3) The Savanna or the Tropical Grass lands Regions
4) The Temperate Grasslands (Steppe)
5) The Monsoon Lands
6) The Mediterranean Region
7) The Taiga Region
8) The Tundra Region

Unit-7: Geography Practicals - Weather Reports.

tandard-X:

Geography:
1 - India - Physical Setting.
1) The Locational and Spatial Setting
2) Physical Features - Relief and Drainage
3) Climate
4) Natural Vegetation
5) Soils
6) Population
7) Irrigation and Power
8) Agriculture
9) Mineral Resources
10) Industries
11) Transport and Communications
12) Places of Interest
13) Sea Ports and Towns
14) International Trade

HISTORY:

I.   History of India upto 1526 A.D.
1.   Pre historic, Paleolithic, Mesolithic and Neolithic culture.
2.   Harappa Civilization - origin, extent, urban planning - Nature of polity and economic organization.
3.   Rise of new Religious movements: Jainism and Buddhism in 6th century B.C.
4.   The Mouryan empire - Ashoka's dhamma, its nature and propagation, Mouryan Administration State, Economy, Art and Architecture.
5.   Post-Mouryan period, Socio-cultural developments with special reference to Satavahanas and Kushans.
6.   Developments in the Gupta period - Administrative system, society, Economy, An and Architecture, Literature, Philosophy, Science and Technology.
7.   Chalukyan period - vatapi Chalukyas, Eastern Chalukyas of Vengi, Rashtra Kutas - Development of society, economy and culture, Religious movements.
8.   Pallavas and Their contribution to society and culture - Art and Architecture.
9.   Rise and fall of Delhi sultanate- Socio- Economic and cultural study.
10.   Impact of Islam on Indian culture and Bhakti and Sufi movement.
11.   Vijayanagar - Bahamani Kingdoms - Society, economy, Art and Architecture.

II.   History of India (1526-1964 A.D.)

A.   Later Medieval India:

1.   Consolidation, Expansion and Diplomacy under Moghul empire upto 1707.
2.   General conditions under Moghul rule:
(a)   Social conditions: Velemas   Nobility - Zamindars, Peasantry - Artisans - Slaves and status of women.
(b)   Economic conditions: Agriculture, Trade and Commerce.

3.   Study of Art and Architecture, Literature, Education and Fine Arts (1526-1761 A.D).
4.   Rise, growth and decline of Marathas - Administration of Sivaji.

B.   Modern India:

5.   Advent of European powers: Portuguese, French and English.

6.   Expansion and Consolidation of British empire:
(a)   Ideologies of expansion:
Mercantilism, orientalism; utilitarianism and Evangelicalism.
(b)   Tools of expansion: War and Diplomacy - Carnatic, Bengal, Subsidiary alliance and Doctrine of Lapse.

7.   Economic Changes:
(a)   Land revenue settlements; permanent settlement, ryotwari and mahalwari, conditions of peasants, rural indebtedness, and recurrent famines.

      (b)   Nature of colonial economy: Commercialisation of agriculture and its effects, Decline of cottage industries, causes for poverty in India.

8.   **Social Changes:**
    (a)   Spread of western education,
    (b)   Rise of professional classes and the emerging intelligentia.
    (c)   Growth of the press; English and in Indian languages,
    (d)   Indian renaissance
    (e)   Socio-Religious movements
    (f)   Status of women.

9.   **Popular resistance to company rule:** a) Peasant and Tribal movements (brief survey) b) Revolt of 1857-causes, nature and results.

10.   **National Movement:**
    a)   Emergence of Indian National Movement - Indian National Congress - Moderates, extremists and Revolutionaries.
    b)   Rise of Gandhi-Nature of Gandhian movements
    c)   Indian polity-(1939-1945) -Quit India movement.
    d)   Subhas Chandra Bose and Indian National Army.
    e)   Emergence of communal trends - Communal politics and partition.

11.   **India 1947-1964.**
    a)   Integration of the Indian, Princely States.
    b)   Making of the constitution.

III.   History of Modern Europe (1789-1960)

1.   French Revolution: Causes - Course - Constitutional assembly - National convention - Directory - Effects of the Revolution.
2.   Emergence of Napoleon Bonaparte - Expansion, Consolidation and down fall.
3.   Vienna congress - Concert of Europe - Metternich - Revolutions of 1830 and 1848.
4.   Second Republic in France - Napoleon III - Paris commune - the rise of IIIrd French Republic.
5.   National movements: Unification of Italy - Unification of Germany.
6.   Revolution in Turkey - Balkan wars.
7.   Scramble for African and Asian colonies - Theories and mechanisms of Imperialism.
8.   First world war-causes and effects. Treaty of Versailles.
9.   Rise of Fascism and Nazism.
10.   League of Nations - Achievements and failures.
11.   Second world war - causes, course and effect.
12.   Post second world war developments - U.N.O, Cold war - Rise of third block.

Sabyllus for Methodology – 4 Social Sciences (b) History

Standard -VIII: History:

1) India and the modern world
2) The Establishment of the british rule in India
3) Revolts against british rule
4) Change in Economy and Society
5) Rise of Nationalism - Freedom movement.

Standard - IX:

History:
1) Pre-history
2) Bronze Age Civilization
3) Early Iron Age Societies
4) The Medieval World
5) The Modern World
6) Capitalism and Industrial Revolution. The Revolutionary Movements

Standard – X: History:

Unit-1: Nationalist Movements
1) Rise and Fall of Napoleon
2) Congress of Vienma
3) French Revolution of 1830
4) 1848 Revolt
5) Unification of Germany
6) Unification of Italy
7) Socialist Movements - Rise of Working Class
8) Paris Commune of 1871.

Unit-2: Imperialism
1) Factors in the Rise of Imperialism
2) Forms and Methods of Imperialism
3) Scramble for Africa and Asia

Unit-3: Contemporary World
1) World War-l: Causes and Results
2) League of Nations
3) Russian Revolution
4) Struglle against the Autocracy, Revolutionary and Intellectual Movements
5) Bolshevik Party and Lenin
6) 1905 Revolution
7) The Course of the Revolt
8) October Revolution and Emergence of U.S.S.R.
9) Impact of the Russian Revolution

Unit-4: World up to the world war-ll
1) Europe between the Two World Wars 2) Rise of Fascism in Italy and Nazism in Germany
3) Militarism in Japan
4) U.S.A. and U.S.S.R. after World War-l
5) Turkey after World War-l
6) Failure of League of Nations
7) Spanish Civil War

8) World War-ll: Causes and Results
9) Political and Economic Consequences of the War
10) Problems of Reconstruction
11) The Unites Nations Organisation
12) Rise of Popular Movements Emergence of Latin America

Unit-5: The World after world War-ll

1) Military Biocs – Cold war
2) Problems of Development of Independent Nations Role of Independent Nations of Asia and Africa in the World Affairs.
3) Non-alignment Movement
4) Role of United Nations in Preserving the Peace in the World
5) Problems of Disarmament and Nuclear Weapons
6) Prominent Personalities of the World.

Unit-6: Cultural Heritage of India and Intellectual awakening
1) Historical Background - Growth and Development of Early Culture and Racial Synthesis
2) Characteristic Features of Indian History - Various Stages of Development
3) Art and Architecture
4) Development of Education and Philosophy
5) Cultural Unity and Bhakti Movement
6) Development of National Consciousness
7) Impact of Alien Cultures on India: Influence of Islam and Christianity
8) Conquest of India by British and Impact of British Rule
9) Impact of English Education
10) Revolt of 1857.

Unit-7: Freedom movement in India.
1) Rise of Nationalism
2) Development of Modern Means of Transport and Communication
3) Moderates and Extremists 4) Vandemataram Movement
5) India During the First World War
6) Home Rule Movement
7) Mahatma Gandhi and Indian National Movement
8) Different Stages of Freedom Movement
9) Second World War
10) Quit India Movement, 1942
11) Mountbatten Plan
12) Integration of Princely States
13) Liberation of French and Portuguese Colonial Possessions in India

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CIVICS:

I.   Political Science - Concepts and Theories:
    1.   Introduction, definition, scope and importance of political science.
    2.   Different approaches to the study of political science - Traditional and Modern.
    3.   Relation with other social sciences: History, Economics, Public Administration, Sociology and Ethics.
    4.   Society - State - Nation.
    5.   Sovereignty: Monism and Pluralism.
    6.   The theories of origin of the State: Diva Right, Social Contract and evolutionary (History).
    7.   Law, Liberty and Equality:
        a)   Law: Source of law-Concepts of Rule of Law,
        b)   Liberty and Equality - Their relationship,
        c)   Theories of Rights,
        d)   Kinds of rights
    8.   Classification of Governments: Traditional (Aristollen)
        Modern: a)   Democracy: Direct and Indirect democratic devises
                        b)   Unitary and Federal
                        c)   Parliamentary and Presidential
    9.   The theory of separation of powers,
    10.   Organs of Government
        (A) Legislature :   (i) Types - Unicameral, Bicameral
                              (ii) Committee system,
                                (iii) Functions of Legislature
                                (iv) Decline of legislature
        (B) Executive :   (i) Types - Parliamentary and Presidential
                              (ii) Rise of executive in modern times
        (C) Judiciary :   (i) Functions   (ii) Independence of Judiciary
                                (iii) Judicial review,
    11.   Electorate: Methods of representation, voting behaviour.
    12.   Political parties - Functions - Types of party system.
    13.   Popular control - Methods of control - Public opinion - Mass media.

II. Public Administration - Concepts and Theories
    1.   Meaning and scope of Public Administration.
    2.   Importance of Public Administration in the context of Globalization, Privatisation & Liberalization.
    3.   Evolution of Public Administration.
    4.   Relation with other Social Sciences (with special reference to political Science; Sociology & Economics).
    5.   Politics & Public Administration - Dichtomy - Woodrew Wilson,
    6.   Classical Theory:
        (a) Administrative Management – Fayal
        (b) Structures 7 Principles of Organisation - Gulick & Urwick
        (c) Scientific management - Taylor.
        (d) Bureaucracy - Weber and Karl Max.
    7.   Human relations Approach: Elton Mayo
    8.   Behavioural Approach: Simon (Decision Making), Barnard (Authority & Informal Organisations) and Me Gregor(Theory X and Theory Y).
    9.   Comparative Public Administration - Weidner
    10.   Development Administration - Weidner
    11.   New public administration

12. New Public Management Perspective.
13. Concepts in Administration: Planning, Leadership, Supervision, Communication, Public Relations, Motivation.

HI. Indian Government and Politics:
1. Introductory note on Nationalist movement in India: Brief sketch : survey from 1885-1947.
2. Constituent Assembly - Making of the Indian constitution. Salient features of the Constitution - amending procedure.
3. Indian Federation : Union - State relations - recent trends.
4. Fundamental rights, Fundamental duties, Directive principles of state policy.
5. President - Election - powers and functions - council of ministers P.M.
6. Parliament of India - Composition powers and functions.
7. Indian judiciary- Supreme Court-composition powers, functions-judicial review.
9. Indian Party system major national parties - regional parties.
10. State Government Governor Council of ministers-Chief Minister.
11. Social and Economic factors in Indian Politics - Language, Religion, caste Regionalism peasant trade unions, youth, tribal movements, their impact on national integration.

IV. Public Administration in India;
1. Evolution of Indian administration -• Ancient Medieval Mughal and British Periods - Continuity and Change in Indian Administration after Independence.
2. Context of Indian Administration -Social, Economic and Political.
3. Union Government and Administration -   President, Prime Minister, Council of Ministers, Central Secretariat, Cabinet Secretariat, Cabinet Committees and Prime Minister Office.Union and State Relations and Agencies - Administrative Relations -Inter State Council, Finance Commission, All India Service, Planning Commission, National Development Council.

5. Public enterprises in India: (a) Forms of Public Enterprises - (i) Department (ii) Corporation and Company. (b) Issues: Privatisation, Dis-investment downsizing.
6. State Government and Administration: Governor, Chief Minister, Council of Ministers, State Secretariat/Directorates, Regional Administration/ General Administration and Chief Secretary.
7. District Administration: Changing Role of District Collector - Special Agencies – DRDA, ITDA.
8. Local Governments - Rural and Urban - Structure and functions – 73rd and 74th Constitutional amendment.
9. Control Over Administration.
   (a) Legislative Control
   (b) Judicial Control
   (c) Citizen's Control - Lok Pal / Lokayukta
   (d) Consumer Protection Forum.
   (e) CVC (Central Vigilance Commission)
10. Administration of Welfare Programmes for Weaker Sections - S.C.s, S.T.s, Women, Minorities.
11. Administrative Reforms, Recommendations of important Commissions and Committees.
12. Good Government and e-Governance.

V. Challenges facing our country today;
1. Illiteracy
2. Casteism
3. Communalism
4. Regionalism
5. Anti-Social Practices

VI. United Nations and India's role:
1. Origin, Aims and structure of the united nations.
2. Principal organs of the united nations.
3. Specialized Agencies of the united nations.
4. Political and non-political achievements of the united nations
5. India's role in the united nations.

ECONOMICS:

1) Micro-Macro, Static-Dynamic, Normative and Positive Economics.
2) Cardinal and Ordinal approaches, and law of diminishing marginal utility.
3) Law of variable proportions, and returns to scale.
4) Different concepts of costs and their Inter-reaction.
5) Concepts of National Income.
6) Meaning of Economic Development and Measure of Economic Development - GNP, PQLI, and HDL
7) Sources of Public revenue.
8) Canons and Effects of Public Expenditure.
9) Functions and classification of Money.
10) Budgets and Money supply - concept of Inflation.
11) Functions of commercial banks and functions of Reserve Bank of India.
12) Methods of Credit control.
13) Importance of Agriculture in the Indian Economy,
14) Population growth in India - causes - problems of over population.
15) Regional disparities - causes of inequalities in Income and Wealth.
16) Meaning of a mixed Economy, characteristic features.
17) The concept of poverty - causes of poverty in India.
18) Types of unemployment - Disguised, Seasonal, Frictional, Structural.
19) Objectives of Planning in India - Important achievements and failures of planning India.
20) Importance of infrastructure.
21) Social sector - Literacy rates in India - Progress in Health Status.
22) Organized and unorganized sectors in the Indian Economy.
23) Structure of the Indian Economy - Agriculture sector, Industry sector and Service sector.

Syllabus for Methodology - 4: Social Sciences (c) Civics

Standard-VIII:

Civics:
1) Democracy
2) Socialism in the Indian Context
3) Secularism in the Indian context
4) World peace and the role of India
5) Traffic Education.

Standard - IX:

Civics:
1) Indian Constitution at Work
2) Government at the Centre
3) Government at the State Level
4) Local Self-Government
5) Traffic Education - Manual Signals.

Standard - X:

Civics: Unit-1: India as a Nation
1) A Glimpse of India
2) What Ideals India Stands for?
3) Factors to Promote National Integration

Unit-2: Indian Democracy
1} Meaning and Nature of Democracy
2) Elections and Election Process in India
3) Major Political Parties in India

Unit-3: Challenges facing our country today
1) Illiteracy
2) Communalism
3) Regionalism
4) Casteism
5) Status of Women
6} Children and Their Rights
7) Law, Society and the Individual
8) Anti-social Practices

Unit-4: Janma Bhoomi
1) Background
2) Concept and Programme
3) Flag
4) Janma Bhoomi Activities

Unit-5: India, United Nations and world problems
I - India in the International Arena:
1) India's Foreign Policy
2) India's Relations with the Super Powers
3) India and commonwealth
4) India and Its Neighbours
5) India and SAARC
6) India's Leading Role in the Third World

II- United Nations (UN):
1) Aims of the United Nations
2) Membership
3) Principal Organs of the UN
4) Specialised Agencies of the United Nations
5) Political and Non-political Achievements of the UN
6} India's Role in the UN

III - Contemporary World Problems:
1) New International Economic Order
2) Environmental Protection 3) Human Rights

Unit-6: Traffic Education.
1) Safety - measures
2) Use of Bicycle on the Roads
3) Use of Motorcycles and Scooters on the Roads.

5. SPECIAL ENGLISH METHODOLOGY

A) Language Skills
  i) Language functions
  ii) Elements of phonetics
  iii) Grammar
  iv) Phrasal Verbs (idioms)
  v) Writing Skills
  vi) Study Skills
  vii) Reference Skills
  viii) Vocabulary
  viii) Punctuations

Questions to be set other than as in Part A General English.
  B)   Syllabus prescribed for Optional English at B.A. Degree level (B.A. Special English) 50 Questions (50 Marks).

(1)   Language and Literature:
  (a) Brief Survey of the English Language : Standardization : Word - formation, foreign influences (Latin, French, Scandinavian); Semantic Changes (relevant chapters from the Outline History of the English Language by F.T. Wood)
  (b) Understanding / Comprehension (i) of a literacy prose passage (ii) of a poem

(2)   Forms of poetry: evolution, kinds and variations:

Sonnet	: :	Wordworth "Scorn not the Sonnet".
Ode	: :	Shelley "Ode to the West Wind"
Elegy	: :	Gray "Elegy Written in a Country Churchyard"
Balled	: :	Yeats "The Balled of Father Giligen"
Lyric	: :	Robert Burns "A Red, Red Rose"
Dramatic	: :	Browing "My Last Duches Monologue

(3)   Element of Drama :

Plot/Structure	: :	Farrell Mitchell "The Best Laid Plans"
Character	: :	J.B. Priestly "Mother's Day"
Dialogue	: :	Anton Chekov "The Marriage Proposal"

(4)   Elements of Fiction :

Point of View	: :	Khushwant Singh "The Interview"
Setting/Atmosphere	: :	Edgar Allen Poe "The Tell-Talc Heart"
Style/Narrative	: :	O Henry "The Gift of the Magi"

Techniques
(5) A.   Poetry from the Elizabethan age to the Pre-Romantic

B.			
	Spenser	: :	Sonnet "One Day I Wrote Her Name"
	Milton	: :	"L'allegro"
	Donne	::	"The Canonization"
	Pope	: :	Extract from "The Rape of the Lock" (Cantos I & II)
	Blake	: :	"The School Boy"

(6) A. <u>Development of drama : 16th and 17th Century British Drama</u>
B. Shakespeare   : :   Othello

(7) Prose : <u>Origin and Development of the Essay; kinds</u>
B. Bacon   : :   "Of Youth and Age"
Steele   ::   "One Judicious Flattery"
Lamb   : :   "Dream Children"
Chesterton   : :   "On Lying in Bed"

(8) A. Fiction: Origin and Development of the Novel
B. Jane Austen   : :   Pride and Prejudice
Indian Writing in English - Indian English Literature

(9) Origin and growth of Indian English Literature.

(10) Poetry for detailed study.
1. Sri Aurobindo - Though The Paraclete
2. Toru Dutt - Sita
3. Nissim Ezekiel - Very Indian Poem in Indian English
4. A.K. Ramanjuan - The Hindoo: he reads his GITA and is calm at all events.
5. K.N. Daruwalla - The Epileptic
6. Gouri Desh Pande - The female of the Species

(11) DRAMA for detai led study
Girish Karnard : Naga Mandala

(12) FICTION
Kushwant Singh ; Train to Pakistan.

(13) American English Language and Literature :
The English language in America

(14) Poetry for detailed study
1) Wallace Stevens : Of Modern Poetry
2) Dickenson : "Hope" is Thing with Feathers
3) Emily Robert Frost: Stopping By woods on a snowy Eveninj
4) Robinson Jeffers : Science
5) Archibald Macleish :   "Not Marble Nor The Gilded
                            "Monuments" For Adcle.
6) William Carlos Williams ; The Yachts.

(15) DRAMA for detailed study
Eugene O 'Neill : The Hairy Ape.

(16) PROSE
Theoreau : Walden