

NATIONAL UNIVERSITY



First Year Syllabus Department of Physics

Four Year B.Sc Honours Course
Effective from the Session : 2013–2014

National University
Subject: Physics
Syllabus for Four Year B. Sc Honours Course
Effective from the Session: 2013-2014

Year wise Papers and marks distribution

FIRST YEAR

Paper Code	Paper Title	Marks	Credits
212701	Mechanics	75	3
212703	Properties of Matter, Waves & Oscillations	75	3
212705	Heat, Thermodynamics and Radiation	75	3
212706	Physics Practical-I	75	3
213709	Fundamentals of Mathematics	100	4
213711	Calculus-I	50	2
212807	Chemistry-I	100	4
212808	Chemistry-I Practical	50	2
213607	or	100	4
213608	Introduction to Statistics Statistics Practical-I	50	2
211501	History of the Emergence of Independent Bangladesh	100	4
	Total=	700	28

Detailed Syllabus

Paper Code	212701	Marks: 75	Credits: 3	Class Hours: 45
Paper Title:	Mechanics			

1. **Vector Algebra:** Vector and scalar quantities; Vectors and their components, Vector addition and subtraction, Scalar and vector triple products, scalar and vector fields, Vector differentiation and integration, Gradient, Divergence and Curl and their physical significance, Gauss's divergence theorem, Green's theorem and Stoke's theorem, Polar, Spherical and Cylindrical co-ordinates.
2. **Concept of Measurement:** Different Measurement units, International system of units, Origin of Length mass and time, Conversion of units from one system to another.
3. **Particles Motion in one dimension:** Concept of motion and frame of reference, Position and displacement, Average velocity and average speed, Instantaneous velocity and speed, Acceleration, Constant acceleration, Equations for motion with constant acceleration, Free-fall acceleration, Equation for free-fall acceleration, Particles of physics and basic structure of atoms and nuclear.
4. **Particles Motion in Two and Three Dimensions:** Position and displacement using vectors, Velocity and average velocity, Acceleration and average acceleration, Equation of motion using vector, Projectile motion, Uniform circular motion.
5. **Force and Motion:** Newton's laws of motion and their applications, Concept of mass, Force and weight, Frictional forces and Properties of friction, Drag force and terminal speed, Forces of nature.
6. **Work, Energy and Power:** Kinetic and Potential energy, Work done by constant and variable forces, Work-energy theorem, Hooke's law, Work done by a spring force, Work done by weight, Power, Gravitational potential energy, Conservation of energy.
7. **System of Particles:** Center of mass of systems of particles, Center of mass of rigid bodies, Linear momentum of a particle, Linear momentum of a system of particles, Conservation of linear momentum for a system of particles.
8. **Collisions of Bodies:** Collisions and its classification, Impulse and linear momentum, Elastic and inelastic collision in one dimension, Motions of the center of mass of colliding bodies.
9. **Rotational Kinematics:** Translational and Rotational motion, Angular Position, Angular displacement, Angular Velocity and angular acceleration, Rotation with constant angular acceleration, Relation between linear and angular kinematics of a particles in circular motion.
10. **Rotational Dynamics:** Torque and angular momentum and their relation, Kinetic energy of rotation and rotational inertia (moment of inertia), Combined Translational and rotational motion of a rigid body, Parallel and perpendicular axes theorems of moment of inertia, calculation of moment of inertia for solids of different shapes, conservation of angular momentum. Relation between angular momentum and torque.

Books Recommended:

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|--|---|-------------------------|
| 1. Spigel, M.R. | : | Vector Analysis |
| 2. Halliday, D., Resnick, R. and Walker, J | : | Fundamentals of Physics |
| 3. Halliday, D and Resnick, R. | : | Physics |
| 4. Sears, F.W., Zemansky, M.W. and Young, H.D. | : | University Physics |

Paper Code	212703	Marks: 75	Credits: 3	Class Hours: 45
Paper Title:	Properties of Matter, Waves & Oscillations			

1. **Gravitation:** Kepler's Laws, Law of universal gravitation, G and its determination, Inertial and gravitational mass, Acceleration due to gravity and its variation, Measurement of acceleration due to gravity by compound pendulum and Kater's pendulum, Gravitational potential and field in simple cases, Gravitational potential energy.
2. **Elasticity:** Hooke's Law, Elastic constants of isotropic solids, Poisson's ratio and their interrelations, Internal elastic potential energy, Experimental determination of elastic constants, Torsion of a cylinder, Bending of beams, Cantilever, Variation of elasticity with temperature.
3. **Surface Tension:** Surface tension and surface energy, Adhesive and cohesive forces, Molecular theory of surface tension, Pressure on a curved membrane of uniform tension, Soap bubble, Capillarity, Angle of contact and its measurement, Determination of surface tension of water and mercury drop, Variation of surface tension with temperature.
4. **Fluid Dynamics:** General concepts of fluid flow, Streamlines, Equation of continuity, Bernoulli's equation, Application of Bernoulli's equation and equation of continuity. Coefficient of viscosity, Critical velocity and Reynold's number, Poiseuille's formula and its correction, Measurement of viscosity, Variation of viscosity with temperature.
5. **Waves:** Waves and Particles, Types of waves, Transverse and Longitudinal waves, Wavelength and frequency, The Speed of a traveling Wave, Wave speed on a stretched string, Energy and power of a traveling string wave, The principle of superposition for waves, Interference of waves, Complex waves, Standing waves and Resonance.
6. **Sound Waves:** The Speed of Sound, Propagation and speed of longitudinal waves, Traveling longitudinal waves, Standing longitudinal waves, Beats, Doppler effect.
7. **Oscillations:** Simple harmonic motion (SHM), Energy consideration in SHM, Applications of SHM, Relation between SHM and uniform circular motion, Combinations of two SHM's, Lissajous' figures, Two-body oscillations, Damped harmonic motion, Forced oscillations and resonance, Power and intensity of wave motion.
8. **Vibrations:** Vibrations of string, Membranes, bars, plates and air-column, Sonometer, Melde's experiment, Rectangular and circular membranes, Transverse and longitudinal vibration of rod, Air-columns in cylindrical pipes, Organ pipes, Chladni's figure.

Books Recommended:

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|--|---|-------------------------|
| 1. Spigel, M.R. | : | Vector Analysis |
| 2. Halliday, D., Resnick, R. and Walker, J | : | Fundamentals of Physics |
| 3. Halliday, D and Resnick, R. | : | Physics |
| 4. Sears, F.W., Zemansky, M.W. and Young, H.D. | : | University Physics |

Paper Code	212705	Marks: 75	Credits: 3	Class Hours: 45
Paper Title:	Heat, Thermodynamics & Radiation			

1. **Heat and Temperature:** Concept of temperature, Thermal equilibrium, Measurement of low and high temperatures, The Celsius & Fahrenheit scales, Thermal expansion, Gas Thermometers, Platinum resistance thermometer, Thermocouple.
2. **Kinetic Theory of Gases:** Equation of state of an ideal gas, Equipartition of energy, Translational kinetic energy, Mean free path, Maxwell's theory of distribution of velocities, Brownian motion, Degrees of freedom & Molar Specific Heats, Van der Waals' Equation of state, Transport phenomena.
3. **Transmission of Heat:** Conduction, Convection, Radiation, Conduction of heat in solids, Measurement of thermal conductivity of a bad conductor, Heat conduction through composite walls.
4. **First Law of Thermodynamics:** Internal Energy, Heat and work, Isothermal and adiabatic processes, Work done by expanding gases, Statement of first law of thermodynamics and applications.
5. **Second Law of Thermodynamics and Entropy:** The Thermodynamic temperature scale, Concept of entropy, Calculation of entropy change in reversible and irreversible processes, Entropy and second law of thermodynamics, Entropy and disorder. The Carnot engine, Efficiency of heat engines, Carnot's theorem, Refrigerator and air-conditioner, Clausius theorem, Clausius-Clapeyron equation.
6. **Third Law of Thermodynamics:** Nernst heat theorem, Phase rule and its uses, Third law of thermodynamics.
7. **Thermodynamic Functions:** Thermodynamic potentials at constant volume and pressure, Maxwell's thermodynamic relations, Specific heat equations, Joule-Thomson effect and its applications.
8. **Radiation Laws:** Concept of black body and black body radiation, Emissive and absorptive powers, Kirchhoff's law, Stefan-Boltzmann's Law, Wien's displacement law, Rayleigh-Jean's law, Planck's quantum hypothesis, Planck's law, Applications of radiation laws.

Books Recommended:

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| 1. Halliday, D, Resnick, R. and Walker, J. | : | Fundamentals of Physics |
| 2. Sears, F.W., Zemansky, M.W. and Young, H.D. | : | University Physics |
| 3. Zemansky, M.W. | : | Heat and Thermodynamics |
| 4. Sears, F.W. | : | An Introduction to Thermodynamics |
| 5. Hossain, T. | : | Text Book of Heat |
| 6. Saha, M.N. and Srivastava, B.N. | : | A Treatise on Heat. |

Paper Code	212706	Marks: 75	Credits: 3	Class Hours: 45
Paper Title:	Physics Practical-I			

To perform two experiments (one from each group) each of three hours duration.

i) Experiments (3 hours each)	2 x 30 =	60
ii) Laboratory note book		10
iii) Experimental Viva-voce		05

Total marks = 75 Marks for each experiment shall be distributed as follows:

a) Theory	5
b) Data collection and tabulation	12
c) Calculation, graphs and result	10
d) Discussion	03

Total marks = 30

Group – A

1. Determination of acceleration due to gravity 'g' by compound pendulum.
2. Determination of acceleration due to gravity 'g' by Kater's pendulum.
3. Determination of Young's modulus and rigidity modulus by Searle's dynamic method.
4. Determination of rigidity modulus of a wire/rod by static method.
5. Determination of rigidity modulus of the material of a wire by dynamic method.
6. Determination of the spring constant and effective mass of a given spiral spring and hence to calculate the rigidity modulus of the material of the spring.
7. Determination of the Young's modulus by the flexure of a beam (bending method).
8. Determination of the moment of inertia of a fly-wheel about its axis of rotation.
9. Determination of the Young's modulus for the material of a wire by Searle's apparatus.
10. Determination of Surface tension of water by capillary tube method.
11. Determination of surface tension of mercury by Quincke's method.

Group – B

1. Determination of the specific heat of solid by method of mixture, with radiation correction.
2. Determination of the specific heat of a liquid by the method of cooling.
3. Determination of the thermal conductivity of a good conductor by Searle's apparatus.
4. Determination of the thermal conductivity of a bad conductor by Lee's method.
5. Determination of mechanical equivalent of heat 'J' with radiation correction.
6. Investigation of the variation of resistance of a copper wire with temperature and determination of its temperature coefficient of resistance.
7. Verify the laws of transverse vibration of a stretched string with a sonometer ($n-l$, and $n - 1/l$ curves only)
8. Determination of the frequency of a tuning fork by Melde's experiment.
9. Determination of latent heat of fusion of ice with radiation correction.
10. Determination of latent heat of condensation of steam with radiation correction.
11. Determination of density of water at various temperature by specific gravity bottle and study the variation of density with temperature from the graph.

Books Recommended:

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| 1. Ahamed, G.U. and Uddin, M.S. | : | Practical Physics |
| 2. Chawdhury, S.A. and Bashak, A.K. | : | ব্যবহারিক পদার্থবিদ্যা |
| 3. Din, K. and Matin, M.A. | : | Advanced Practical Physics |
| 4. Worsnop and Flint | : | Advanced Practical Physics |

Paper Code	213709	Marks: 100	Credits: 4	Class Hours: 60
Paper Title:	Fundamentals of Mathematics			

1. **Real Number System:** Field and order properties, Natural numbers, Integers and rational numbers,

- Absolute value and their properties, Basic inequalities.
- Complex Number System:** Field of Complex numbers, De Moivre's theorem and its applications.
 - Theory of equations:** Relations between roots and coefficients, Symmetric functions of roots, Sum of the powers of roots, Synthetic division, Des Cartes' rule of signs, Multiplicity of roots, Transformation of equations.
 - Matrices and Determinants:** Notion of matrix, Types of matrices, Algebra of matrices, Determinant function and its properties, Minors, Cofactors, Expansion and evaluation of determinants, Elementary row and column operations and row-reduced echelon matrices, Invertible matrices, Diagonal, triangular and Symmetric matrices.
 - System of Linear Equations:** System of linear equations (homogeneous and non-homogeneous) and their solutions, Gaussian elimination, Application of matrices and determinants for solving system of linear equations, Applications of system of equations in real life problems.
 - Vector Spaces:** Euclidean n -space, Real vector spaces, Subspaces, Linear combination of vectors, Linear dependence of vectors, Basis and dimension, Linear transformations, Matrix representation of linear transformation, Kernel and image, Eigenvalues and Eigenvectors.
 - Two-dimensional Geometry:** Transformation of coordinates, Pair of straight lines (homogeneous second degree equations, General second degree equations representing pair of straight lines, angle between pair of straight lines, Bisectors of angle between pair of straight lines), General equations of second degree (reduction to standard forms, Identifications, Properties and tracing of conic s).
 - Three-dimensional Geometry:** Three-dimensional coordinates, Distance, Direction cosines and direction ratios, Planes and straight lines, Vectors in plane and space, Algebra of vectors, Scalar and vector product, Vector equations of straight lines and planes.

Books Recommended :

- S. Bernard & J M Child- Higher algebra.
- Howard Anton & Chris Rorres – Elementary Linear Algebra with Application.
- Khosh Mohammad- Analytic Geometry and Vector Analysis.
- Md. Abdur Rahman – Linear Algebra.

Paper Code	213711	Marks: 50	Credits: 2	Class Hours: 30
Paper Title:	Calculus-I			

- Functions & their graphs :** Polynomial and rational functions, Logarithmic and exponential functions, Trigonometric functions & their inverses, Hyperbolic functions & their inverses, Combinations of such functions.
- Limit and continuity:** Definitions and basic theorems on limit and continuity, Limit at infinity & infinite limits, Computation of limits.
- Differentiation:** Tangent lines and rates of change. Definition of derivative, One-sided derivatives. Rules of differentiation, Successive differentiation, Leibnitz's theorem, Related rates, Linear approximations and differentials.
- Applications of Differentiation:** Mean value theorem, Maximum and minimum values of functions, Concavity and points of inflection, Optimization problems.
- Integration:** Anti-derivatives and indefinite integrals, Techniques of integration, Definite integration using anti-derivatives, Fundamental theorems of calculus, Basic

properties of integration, Integration by reduction.

6. **Applications of Integration:** Arc length, Plane areas, Surfaces of revolution, Volumes of solids of revolution, Volumes by cylindrical shells, Volumes by cross sections.
7. **Approximation and Series:** Taylor polynomials and series, Convergence of series, Taylor's series, Taylor's theorem and remainders, Differentiation and integration of series.

Books Recommended:

1. Howard Anton : Calculus (7th and forward editions).
2. E.W. Swokowski : Calculus with Analytic Geometry.
3. Md. A Matin & B Chakraborty : Differential Calculus.

Paper Code	212807	Marks: 100	Credits: 4	Class Hours: 60
Paper Title:	Chemistry-I			

1. **Measurements and the Scientific Method:** Measurements, units, SI units, reliability of measurements – precision and accuracy, rounding off, significant figures, significant figures in calculation, mean and median, errors, sources of errors.
2. **Structure of atom:** Atom, isotopes, Atomic masses, Mass spectroscopy, Atomic nucleus, Nuclear binding energy, Nuclear reactions –fission and Fusion reactions, Bohr atom model, Spectrum of atomic hydrogen, Dual nature of electron, Heisenberg uncertainty principle, Quantum numbers, Atomic orbitals, Aufbau principle, Pauli exclusion principle, Hund's rule of maximum multiplicity, Electronic configuration of atoms.
3. **Periodic Table:** Periodic law, Periodic table, Electronic configurations from the periodic table, Periodic properties of the elements such as ionization energies, Electron affinity, Electro negativity, Atomic/ionic radius along a period and down a group, Diagonal relationship
4. **Chemical Bonds:** Chemical bond, Types of chemical bonds – ionic, Covalent coordination, Metallic, Hydrogen, Polar and no polar covalent bonds, Lewis dot structure, Shapes of molecules, VSEPR theory, Valence bond theory, Hybridization, σ - and δ -bonding in compounds, Molecular orbital theory.
5. **Oxidation and reduction:** Redox reactions, Writing and balancing Redox reactions,
6. **States of Matter:** Comparison between solids, Liquids and gases, Changes of state, m.p. and b.p, phase transition, Phase diagram of water.
7. **Gaseous and Their Properties:** The gas laws , The perfect gas equation, The kinetic theory of gases, Van der waals equations, Real gases, Graham's laws of diffusion and Effusion.
8. **Solutions:** Solubility and intermolecular forces, Solubility product, Types of concentration units, Colligative properties of solutions, Henry's law, Nernst distribution law.
9. **Acids and Bases:** Various concepts on acids and bases, Conjugate acids and bases, Neutralization reactions acid- base strength, p_H , Acid-base titrations, Acid-base indicators, Acid-base properties of salts, The common ion effect, Buffer solutions, Hard and soft acids and bases.
10. **Chemical Equilibrium:** Reversible reactions and the equilibrium state, The

equilibrium law, Reaction quotients and equilibrium constants, Calculations using K_c , K_p . Homogeneous and heterogeneous equilibria, The principle of Le Chatelier and Brown.

11. **Hydrocarbons:** Hydrocarbons, Saturated and unsaturated hydrocarbons, Alkanes, Alkenes, And Alkynes, Nomenclature of organic compounds-the IUPAC system natural gas, Petroleum, Petrochemicals.
12. **Study of different classes of organic Compounds:** Alcohols, Aldehydes, Ketones, Carboxylic Acids, Esters, Amines and Amides.

Books recommended:

1. General Chemistry, D. D. Ebbing, Houghton Mifflin Co.
2. Chemistry – The Molecular Nature of Matter and Change, M. Silberberg. WCB /Mc Graw- Hill.
3. Introduction to Modern Inorganic Chemistry, S.Z. haider, Friends' International.
4. Principles of physical chemistry, M. M. Huque and M. A Nawab, students' publications.
5. Essentials of Physical chemistry, B.S Bahl, G.D Tuli and A Bahl, S. Chand & Co.Ltd.
6. Advanced Organic Chemistry, B.S. Bahl and A Bahl, S. Chand & Co. Ltd.
7. A Level chemistry by C.W. Ramsden
8. Organic Chemistry: T Morrison and R.N Boyed,
9. Fundamental of Organic Chemistry by W Solomons

Paper Code	212808	Marks: 50	Credits: 2	Class Hours: 30
Paper Title:	Chemistry-I Practical			

1. Preparation of $\text{FeSO}_4 \cdot 7\text{H}_2\text{O}$, Mohr's salt and potash alum.
2. Separation and identification of four radicals from a mixture of anions and cations The cations are Pb^{2+} , Cu^{2+} , Cd^{2+} , Al^{3+} , Fe^{2+} , Fe^{3+} , Co^{2+} , Ni^{2+} , Zn^{2+} , Ca^{2+} , Ba^{2+} , Na^+ , K^+ , and NH_4^+ , the anions are NO_3^- , CO_3^{2-} , S^{2-} , SO_4^{2-} , Cl^- , Br^- and I^- .
3. Standardization of NaOH solution using standard oxalic acid solution,
4. Determination of Fe^{2+} using standard permanganate solution 5.
Iodometric determination of copper(II) using standard Na_2SO_3 solution.
6. Gravimetric determination of nickel as $\text{Ni}(\text{HDMG})_2$ complex 7.
Determination of the enthalpy change for the decomposition sodium dicarbonate into sodium carbonate.
8. Determination of the pH - neutralization curves of a strong acid by a strong base.
9. Investigation of the conductance behaviour of electrolytic solution and applications (acetic acid)
10. Determination of the presence of nitrogen, halogen and sulphur in organic compounds.
11. Identification of the functional groups (unsaturation, alcohol, phenol, carbonyl, aldehyde, ketone, carboxylic acid, aromatic amine, amide and nitro- groups) in organic compound.

Books Recommended:

1. A Text Book of Quantitative Inorganic Analysis, A.I. Vogel, 3rd/4th edition, ELBS and Longman Green & Co. Ltd.
2. A Text Book of Quantitative Inorganic Analysis, A.I. Vogel 3rd/4th edition, ELBS and Longman Green & Co. Ltd.
3. Practical physical chemistry, A Faraday.
4. A Text Book of practical organic chemistry, A.I. vogel, ELBS edition.

Paper Code	213607	Marks: 100	Credits: 4	Class Hours: 60
Paper Title:	Introduction to Statistics			

- 1. Descriptive Statistics:** Statistics-Its nature and some important use, Qualitative and quantitative data, Classification, Tabulation and frequency distribution, Graphical representation of data, Measure of location, Measures of Dispersion, Skewness and Kurtosis, Mathematical relationship among different measures of location, dispersion, Skewness and kurtosis.
- 2. Bivariate Data:** Correlation coefficient, Correlation analysis, The purpose and uses of regression analysis, Simple regression and methods of least squares and estimation of parameters, Correlation ratio, Rank correlation, Partial and multiple correlation.
- 3. Elementary Probability:** Meaning of Probability, Classical and empirical definitions of Probability, Axiomatic approach of defining probability, Event, Sample space and simple problems on probability, Addition rule, Conditional probability, Multiplication rule and Bayes theorems, The concept of a random variables, Probability function and probability density function, Joint probability function. Marginal and conditional distributions, Statistical independence, Expected value and related theorems, Moment generating function, Common probability distributions, Binomial, Poisson and Normal.
- 4. Index Number:** Concept of an index number and problems in the construction of index number, Types of indices (Price, Quantity, Value and cost of living indices) and their uses, Tests for index numbers.
- 5. Time Series analysis:** Elements of time-series analysis, Measurement of trend by moving average, By least square method, Trend curve, Determination of seasonal indices, Cyclical movements.
- 6. Numerical Mathematics:** Differences of a polynomial, Finite difference operator, Difference table, Newton's formula and starling's central difference formula, Inverse interpolation, Numerical integration.

Books Recommended:

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| 1. Yule and Kendall | : Introduction to Theory of Statistics. |
| 2. Islam, M. Nurul. | : An Introduction to Statistics and Probability. |
| 3. Jalil A. and Ferdous R. | : Basic Statistics. |
| 4. Mostafa M.G. | : Methods of Statistics. |
| 5. David E.N. | : Probability Theory for Statistical Methods. |
| 6. Weatherburn C.F. | : A First Paper in Mathematical statistics. |
| 7. Mosteller, Roure and Thomas | : Probability with Statistical Applications. |
| 8. Ali A. | : Theory of Statistics Vol. I |
| 9. Mallick, S.A. | : সাংখ্যিক গনিত |
| 10. Freeman H. | : Acturial, Mathematics Vols; I and II |
| 11. Scarborough | : Numerical Mathematics. |
| 12. David F.N. | : Probability theory for Statistical Methods. |
| 13. Shil R.N. | : Introduction to Theory of Statistics. |
| 14. Feller, W | : Introduction to Statistical Time Series (latest ed.). |
| 15. Gupta and Kapoor | : Applied Statistics. |

Paper Code	213608	Marks: 50	Credits: 2	Class Hours: 30
Paper Title:	Statistics Practical-I			

Condensation and tabulation of data, Graphical representation of data, Frequency table, Measures of location, Dispersion, Moments, Skewness and Kurtosis, measures of correlation coefficient, Rank correlation, Fitting of simple regression lines, Fitting of Binomial, Normal and Poisson's distributions, Finding trend values and seasonal variation from time series data by different methods, Calculation of Index numbers and test of index number, Use of Newton's forward and backward formula, Solution of numerical integration.

Paper Code	211501	Marks: 100	Credits: 4	Class Hours: 60
Paper Title:	History of the Emergence of Independent Bangladesh			

স্বাধীন বাংলাদেশের অভ্যুদয়ের ইতিহাস

ভূমিকা: স্বাধীন বাংলাদেশের অভ্যুদয়ের ইতিহাস-পরিধি ও পরিচিতি

১। দেশ ও জনগোষ্ঠীর পরিচয়

- ক) ভূ প্রকৃতির বৈশিষ্ট্য ও প্রভাব
- খ) নৃতাত্ত্বিক গঠন
- গ) ভাষা
- ঘ) সংস্কৃতির সমন্বয়বাদিতা ও ধর্মীয় সহনশীলতা
- ঙ) অভিন্ন বাংলার পরিপ্রেক্ষিতে তৎকালীন পূর্ববঙ্গ ও বর্তমান বাংলাদেশের স্বকীয় সত্তা

২। অখণ্ড স্বাধীন বাংলা রাষ্ট্র গঠনের প্রয়াস ও উপমহাদেশের বিভক্তি, ১৯৪৭

- ক) ঔপনিবেশিক শাসন আমলে সাম্প্রদায়িকতার উদ্ভব ও বিস্তার
- খ) লাহোর প্রস্তাব, ১৯৪০
- গ) অখণ্ড স্বাধীন বাংলা রাষ্ট্র গঠনের উদ্যোগ, ১৯৪৭ ও পরিণতি
- ঘ) পাকিস্তান সৃষ্টি, ১৯৪৭

৩। পাকিস্তান: রাষ্ট্রীয় কাঠামো ও বৈষম্য

- ক) কেন্দ্রীয় ও প্রাদেশিক কাঠামো
- খ) সামরিক ও বেসামরিক আমলাতন্ত্রের প্রভাব
- গ) অর্থনৈতিক, সামাজিক ও সাংস্কৃতিক বৈষম্য

৪। ভাষা আন্দোলন ও বাঙালির আত্মপরিচয় প্রতিষ্ঠা

- ক) মুসলিম লীগের শাসন ও গণতান্ত্রিক রাজনীতির সংগ্রাম
- খ) আওয়ামী লীগের প্রতিষ্ঠা, ১৯৪৯
- গ) ভাষা আন্দোলন: পটভূমি ও ঘটনা প্রবাহ
- ঘ) হক-ভাসানী-সোহরাওয়ার্দীর যুক্তফ্রন্ট, ১৯৫৪ সালের নির্বাচন ও পরিণতি

৫। সামরিক শাসন: আইয়ুব খান ও ইয়াহিয়া খানের শাসনামল (১৯৫৮-৭১)

- ক) সামরিক শাসনের সংজ্ঞা ও বৈশিষ্ট্য
- খ) আইয়ুব খানের ক্ষমতা দখল ও শাসনের বৈশিষ্ট্য (রাজনৈতিক নিপীড়ন, মৌলিক গণতন্ত্র, ধর্মের রাজনৈতিক ব্যবহার)
- গ) আইয়ুব খানের পতন ও ইয়াহিয়া খানের শাসন, এক ইউনিট বিলুপ্তিকরণ, সার্বজনীন ভোটাধিকার, এলএফও (Legal Framework Order)

- ৬। জাতীয়তাবাদের বিকাশ ও স্বাধিকার আন্দোলন
 ক) সাংস্কৃতিক আত্মসনের বিরুদ্ধে প্রতিরোধ ও বাঙালি সংস্কৃতির উজ্জীবন
 খ) শেখ মুজিবুর রহমানের ৬-দফা আন্দোলন
 গ) ৬-দফা আন্দোলনের প্রতিক্রিয়া, গুরুত্ব ও তাৎপর্য
 ঘ) আগরতলা মামলা, ১৯৬৮
- ৭। ১৯৬৯-এর গণঅভ্যুত্থান ও ১১-দফা আন্দোলন
 ক) পটভূমি
 খ) আন্দোলনের কর্মসূচী, গুরুত্ব ও পরিণতি
- ৮। ১৯৭০ এর নির্বাচন, অসহযোগ আন্দোলন ও বঙ্গবন্ধুর স্বাধীনতা ঘোষণা
 ক) নির্বাচনের ফলাফল এবং তা মেনে নিতে কেন্দ্রের অস্বীকৃতি
 খ) অসহযোগ আন্দোলন, বঙ্গবন্ধুর ৭ই মার্চের ভাষণ, অপারেশন সার্চলাইট
 গ) বঙ্গবন্ধুর স্বাধীনতা ঘোষণা ও গ্রেফতার
- ৯। মুক্তিযুদ্ধ ১৯৭১
 ক) গণহত্যা, নারী নির্যাতন, শরণার্থী
 খ) বাংলাদেশ সরকার গঠন ও স্বাধীনতার ঘোষণাপত্র
 গ) স্বতঃস্ফূর্ত প্রাথমিক প্রতিরোধ ও সংগঠিত প্রতিরোধ (মুক্তিফৌজ, মুক্তিবাহিনী, গেরিলা ও সম্মুখ যুদ্ধ)
 ঘ) মুক্তিযুদ্ধে প্রচার মাধ্যম (স্বাধীন বাংলা বেতার কেন্দ্র, বিদেশী প্রচার মাধ্যম ও জনমত গঠন)
 ঙ) ছাত্র, নারী ও সাধারণ মানুষের অবদান (গণযুদ্ধ)
 চ) মুক্তিযুদ্ধে বৃহৎশক্তি সমূহের ভূমিকা
 ছ) দখলদার বাহিনী, শান্তিকমিটি, আলবদর, আলশামস, রাজাকার বাহিনী, রাজনৈতিক দল ও দেশীয় অন্যান্য সহযোগীদের স্বাধীনতাবিরোধী কর্মকাণ্ড ও বুদ্ধিজীবী হত্যা
 জ) পাকিস্তানে বন্দি অবস্থায় বঙ্গবন্ধুর বিচার ও বিশ্বপ্রতিক্রিয়া
 ঝ) প্রবাসী বাঙালি ও বিশ্বের বিভিন্ন দেশের নাগরিক সমাজের ভূমিকা
 ঞ) মুক্তিযুদ্ধে ভারতের অবদান
 ট) যৌথ বাহিনী গঠন ও বিজয়
 ঠ) স্বাধীনতা সংগ্রামে বঙ্গবন্ধুর নেতৃত্ব
- ১০। বঙ্গবন্ধু শেখ মুজিবুর রহমানের শাসনকাল, ১৯৭২-১৯৭৫
 ক) স্বদেশ প্রত্যাবর্তন
 খ) সংবিধান প্রণয়ন
 গ) যুদ্ধ বিধবস্ত দেশ পুনর্গঠন
 ঘ) সপরিবারে বঙ্গবন্ধু হত্যা ও আদর্শিক পটপরিবর্তন

History of the Emergence of Independent Bangladesh

Introduction: Scope and description of the emergence of Independent Bangladesh.
 Writing on this topic.

1. Description of the country and its people.

- Geographical features and their influence.
- Ethnic composition.

- c. Language.
- d. Cultural syncretism and religious tolerance.
- e. Distinctive identity of Bangladesh in the context of undivided Bangladesh.

2. Proposal for undivided sovereign Bengal and the partition of the Sub Continent, 1947.

- a. Rise of communalism under the colonial rule, Lahore Resolution 1940.
- b. The proposal of Suhrawardi and Sarat Bose for undivided Bengal : consequences
- c. The creation of Pakistan 1947 .

3. Pakistan: Structure of the state and disparity.

- a. Central and provincial structure.
- b. Influence of Military and Civil bureaucracy.
- C. Economic , social and cultural disparity

4. Language Movement and quest for Bengali identity

- a. Misrule by Muslim League and Struggle for democratic politics .
- b. The Language Movement: context and phases .
- c. United front of Haque – Vasani – Suhrawardi: election of 1954, consequences.

5. Military rule: the regimes of Ayub Khan and Yahia Khan (1958-1971)

- a. Definition of military rules and its characteristics.
- b. Ayub Khan's rise to power and characteristics of his rule (Political repression, Basic democracy, Islamisation)
- c. Fall of Ayub Khan and Yahia Khan's rule (Abolition of one unit, universal suffrage, the Legal Framework Order)

6. Rise of nationalism and the Movement for self determination .

- a. Resistance against cultural aggression and resurgence of Bengali culture.
- b. Sheikh Mujibur Rahman and the six point movement
- c. Reactions : Importance and significance
- d . The Agortola Case 1968.

7. The mass- upsurge of 1969 and 11 point movement: background,programme and significance.

8. Election of 1970 and the Declaration of Independence by Bangobondhu

- a. Election result and centres refusal to comply
- b. The non co-operation movement, the 7th March , Address , Operation Searchlight

- c. Declaration of Independence by Bangobondhu and his arrest

9. The war of Liberation 1971

- a. Genocide, repression of women, refugees
- b. Formation of Bangladesh government and proclamation of Independence
- c. The spontaneous early resistance and subsequent organized resistance (Mukti Fouz, Mukti Bahini, guerillas and the frontal warfare)
- d. Publicity Campaign in the war of Liberation (Shadhin Bangla Betar Kendra, the Campaigns abroad and formation of public opinion)
- e. Contribution of students, women and the masses (Peoples war)
- f. The role of super powers and the Muslim states in the Liberation war.
- g. The Anti-liberation activities of the occupation army, the Peace Committee, Al-Badar, Al-Shams, Rajakars, pro Pakistan political parties and Pakistani Collaborators , killing of the intellectuals.
- h. Trial of Bangabondhu and reaction of the World Community.
- i. The contribution of India in the Liberation War
- j. Formation of joint command and the Victory
- k. The overall contribution of Bangabondhu in the Independence struggle.

10. The Bangabondhu Regime 1972-1975

- a. Homecoming
- b. Making of the constitution
- c. Reconstruction of the war ravaged country
- d. The murder of Bangabondhu and his family and the ideological turn-around.

সহায়ক গ্রন্থ

১. নীহার রঞ্জন রায়, *বাঙালীর ইতিহাস*, দে' জ পাবলিশিং, কলকাতা ১৪০২ সাল।
২. সালাহ উদ্দিন আহমেদ ও অন্যান্য (সম্পাদিত), *বাংলাদেশের মুক্তি সংগ্রামের ইতিহাস ১৯৪৭-১৯৭১*, আগামী প্রকাশনী, ঢাকা ২০০২।
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৫. ড. হারুন-অর-রশিদ, *বাঙালির রাষ্ট্রচিন্তা ও স্বাধীন বাংলাদেশের অভ্যুদয়*, আগামী প্রকাশনী, ঢাকা ২০০৩।
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৭. ড. আতফুল হাই শিবলী ও ড.মোঃ মাহবুবর রহমান, *বাংলাদেশের সাংবিধানিক ইতিহাস ১৭৭৩-১৯৭২*, সুবর্ণ প্রকাশন, ঢাকা ২০১৩।
৮. মুনতাসির মামুন ও জয়ন্ত কুমার রায়, *বাংলাদেশের সিভিল সমাজ প্রতিষ্ঠার সংগ্রাম*, অবসর, ঢাকা ২০০৬।
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