Syllabus for Second Year of CHSE, 2023 - 2024

Alternative English

A01PRO Prose

A20 AWWS The Wonder World of Science — Aspire Science Higher Secondary School

The Wonder World of Science

A21 AOEX Our Environment — Aspire Science Higher Secondary School

Our Environment

A22 AWBX The World of Business — Aspire Science Higher Secondary School

The World of Business

A23 ACWX The Changing World — Aspire Science Higher Secondary School

The Changing World

A02POE Poetry

A24 AICS Indian Children Speak — Aspire Science Higher Secondary School

Indian Children Speak

A25 AGPX The Goat Paths — Aspire Science Higher Secondary School

The Goat Paths

A26 AQCX Of a Questionable Conviction — Aspire Science Higher Secondary School

Of a Questionable Conviction

A27 AMIR Mirror — Aspire Science Higher Secondary School

Mirror

A28 ATOA Toads — Aspire Science Higher Secondary School

Toads

A03SHST Short Stories

A29 AHMX The Happy Man — Aspire Science Higher Secondary School

The Happy Man

A30 ATRE The Tree — Aspire Science Higher Secondary School

The Tree

A31 AWMX The Watch Man — Aspire Science Higher Secondary School

The Watch Man

A04OAP One Act Plays

A32 AHTX The Hour of Truth — Aspire Science Higher Secondary School

The Hour of Truth

A05GRA Grammar and Usage

A33 ARTA Revision of Tense and Aspect — Aspire Science Higher Secondary School

Revision of Tense and Aspect

A34	**ARPV**	Revision of Prepositions and Phrasal Verbs	Aspire Science Higher Secondary School

Revision of Prepositions and Phrasal Verbs

A35	**ACTX**	Clause Types	Aspire Science Higher Secondary School

Clause Types

A36	**ALDX**	Linking Devices	Aspire Science Higher Secondary School

Linking Devices

A37	**AWOE**	Word Order and Emphasis	Aspire Science Higher Secondary School

Word Order and Emphasis

A06Exam Examination

A38	**AUSP**	Unseen Passage	Aspire Science Higher Secondary School

Unseen Passage

A39	**ANMX**	Note Making	Aspire Science Higher Secondary School

Guided and Unguided Note Making

A43	**AGIC**	Grammar and Usage	Aspire Science Higher Secondary School

Grammar and Usage

A44	**ABPW**	Brochure and Pamphlet writing	Aspire Science Higher Secondary School

Designing and writing a brochure / pamphlet

A45	**ADTC**	Dialogue and Telephonic Conversession	Aspire Science Higher Secondary School

Dialogues of a face to face/Telephonic conversetion

A46	**ARPS**	Rewriting	Aspire Science Higher Secondary School

Rewriting a poem/short story as a different form of discourse i.e. a page of a diary, a newspaper report/article or a script for a play etc.

A47	**ASBE**	Adding a suitable beginning/ending/title to a given poem	Aspire Science Higher Secondary School

Adding a suitable beginning/ending/title to a given poem

Biology:Botany

B06RO Reproduction in Organisms

B36 BSRF Sexual Reproduction in flowering plants — Aspire Science Higher Secondary School

1. Flower structure
2. Development of male and female gametophytes (LQ)
3. Pollination-types, agencies and examples
4. Outbreeding devices
5. Pollen-Pistil interaction
6. Double fertilization (LQ)
7. Post fertilization events
8. Development of endosperm and embryo
9. Development of seed and formation of fruit
10. Special modes: apomixis, parthenocarpy, polyembryony
11. Significance of seed and fruit formation

B07GMBE Genetics, Molecular Biology and Evolution

B42 BMBX Molecular Biology — Aspire Science Higher Secondary School

1. Search for genetic material and DNA as genetic material
2. Structure of DNA (LQ)
3. Structure of RNA
4. DNA packaging
5. DNA replication (LQ)
6. Central dogma
7. Transcription
8. Genetic code
9. Translation (LQ)
10. Gene expression and regulation - Lac Operon
11. Genome and human genome project
12. DNA finger printing

B08BHW Biology and Human Welfare

B47 BIFP Improvement in food production — Aspire Science Higher Secondary School

1. Plant breeding, tissue culture, single cell protein, biofortification
2. Apiculture and Animalhusbandary

B48 BMHW Microbes in human welfare — Aspire Science Higher Secondary School

1. In household food processing
2. Industrial production
3. Sewage treatment
4. Energy generation
5. Microbes as biocontrol agents
6. Biofertilizers

B09BTA Biotechnology and its Applications

B50 BPBT Processes of biotechnology — Aspire Science Higher Secondary School

Genetic engineering (Recombinant DNA technology)

B51 BABT Application of Biotechnology — Aspire Science Higher Secondary School

1. Human insulin and vaccine production
2. Gene therapy
3. Genetically modified organism - Bt crops
4. Transgenic Animals
5. Biosafety issues- Biopiracy and patents

B10EE Ecology and environment

B52 BEAP Ecological Adaptations and Population — Aspire Science Higher Secondary School

Organisms and environemnt
1. Habitat and niche
2. Ecological adaptations
3. Population interactions - mutualism, competition, predation, parasitism
4. Population attributes - growth, birth rate and death rate, age distribution

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B53 BECO Ecosystem — Aspire Science Higher Secondary School

1. Patterns
2. Components
3. Productivity and decomposition
4. Energy flow
5. Pyramids of number, biomass, energy
6. Nutrient cycling (carbon and phosphorous);
7. Ecological succession
8. Ecological Services - Carbon fixation, pollination, oxygen release

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B54 BBDC Biodiversity and its conservation — Aspire Science Higher Secondary School

1. Concept of Biodiversity
2. Patterns of Biodiversity
3. Importance of Biodiversity
4. Loss of Biodiversity
5. Conservation
6. Hotspots
7. Endangered organisms, extinction, Red Data Book
8. Biosphere reserves, National parks and Sanctuaries.

B55 BEAX Environmental Issues — Aspire Science Higher Secondary School

Environmental issues:
1. Air pollution and its control (LQ)
2. Water pollution and its control (LQ)
3. Agrochemicals and their effects
4. Solid waste management
5. Radioactive waste management
6. Greenhouse effect
7. Global warming
8. Ozone depletion
9. Deforestation
10. Any three case studies as success stories addressing environmental issues

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B20PRA Practicals

B69 BSWA Studies on Soil, Water and Air attributes — Aspire Science Higher Secondary School

1. Collect and study soil from at least two different sites and study them for texture, moisture content, pH and water holding capacity of soil. Correlate with the kinds of plants found in them.
2. Collect water from two different water bodies around you and study them for pH, clarity and presence of any living organisms.
3. Study the presence of suspended particulate matter in air at the two widely different sites.

B71 BSLP Studies on plant pigments — Aspire Science Higher Secondary School

1. Study of the effect of temperature and chemical (methanol, acetone, formaldehyde) on leaching of pigments in beet root.
2. Study of plant pigments by paper chromatography.

B72 BSPH Study of photosynthesis — Aspire Science Higher Secondary School

1. Effect of different wave length of light on photosynthesis by Wilmott's bubbler.
2. Study of effect of dissolved carbondioxide on photosynthesis by Wilmott's bubbler.

B73 BSTR Studies on transpiration — Aspire Science Higher Secondary School

1. Study of transpiration by Ganong's and Farmer's photometer.
2. Study of relation between transpiration and absorption by T/A apparatus.
3. Comparative study of rate of transpiration from upper and lower surface of dicot leaf.
4. Study of distribution of stomata on upper and lower surface of a dicot and a monocot leaf. (Minor)

B74 BSPL Study of plasmolysis — Aspire Science Higher Secondary School

Study of plasmolysis in cells of epidermal peels of Rhoeo discolour and to fimd out the concentration of isotonic condition. (Minor)

B76 BSOP Study of osmosis — Aspire Science Higher Secondary School

Study of osmosis by potato osmometer. (Minor)

B77 BSPP Studies on Population of plants — Aspire Science Higher Secondary School

1. Study of plant population density by quadrate method.
2. Study of plant population frequency by quadrate method.

B78 BSSG Studies on seed germination — Aspire Science Higher Secondary School

1. Demonstration of conditions necessary for germination (Spotting)
2. Demonstration of types of germination: epigeal and hypogeal germination (Spotting)

B79 BDPG Demonstration of phototropism and geotropism — Aspire Science Higher Secondary School

1. Demonstration of experimental set up showing phototropism. (Spotting)
2. Demonstration of experimental set up showing geotropism. (Spotting)

B80 BVMR Analysis of samples for verification of mendelian ratio. — Aspire Science Higher Secondary School

Analysis of samples for verification of mendelian ratio using pea seeds or colour beads. (Minor)

B93 BSPG Study of pollen germination — Aspire Science Higher Secondary School

1. Study of pollen germination on a slide. (Minor)

B94 BIMA Identification with morphological adaptations — Aspire Science Higher Secondary School

Identification with morphological adaptations of the following specimens (Spotting)
1. Hydrophytes
2. Xerophytes

Biology:Zoology

B06RO Reproduction in Organisms

B35 BARX Asexual reproduction — Aspire Science Higher Secondary School

1. Reproduction, a characteristic feature of all organisms for continuation of species
2. Modes of reproduction - Asexual and sexual
3. Asexual reproduction: Modes- Binary fission, sporulation, budding, gemmule formation, fragmentation, vegetative propagation in plants

B37 BSRM Human Reproduction — Aspire Science Higher Secondary School

Sexual reproduction in man:
1. Male reproductive system (LQ)
2. Female reproductive system(LQ)
3. Microscopic anatomy of testis and ovary
4. Gametogenesis - spermatogenesis (LQ) and oogenesis (LQ)
5. Menstrual cycle
6. Fertilisation

B38 BHDX Human Development — Aspire Science Higher Secondary School

Human Development
1. Embryo development upto blastocyst formation
2. Implantation
3. Pregnancy
4. Placenta formation (Elementary idea)
5. Parturition (Elementary idea)
6. Lactation (Elemntary idea).

B40 BRHX Reproductive health — Aspire Science Higher Secondary School

1. Need for reproductive health and prevention of sexually transmitted diseases (STD)
2. Birth control - Need and Methods
3. Contraception
4. Medical Termination of Pregnancy (MTP)
5. Amniocentesis
6. Infertility and assisted reproductive technologies - IVF, ZIFT, GIFT (Elementary idea for general awareness).

B07GMBE Genetics, Molecular Biology and Evolution

B41 BGEN Genetics — Aspire Science Higher Secondary School

1. Mendelian Inheritance (LQ)
2. Deviations from Mendelism - Incomplete dominane, Co-dominance, Multiple alleles and Inheritance of blood groups, Pleiotropy, Elementary idea of polygenic inheritance
3. Chromosome theory of inheritance
4. Chromosomes and genes
5. Linkage and crossing over
6. Sex determination - In humans, birds, honey bee (LQ)
7. Sex linked inheritance - Haemophilia (LQ), Colour blindness (LQ)
8. Mendelian disorders in humans - Thalasemia
9. Chromosomal disorders in humans - Down's syndrome, Turner's and Klinefelter's syndromes (LQ)

B43 BEVO Evolution — Aspire Science Higher Secondary School

1. Origin of life
2. Biological evolution and evidences for biological evolution
   a. Paleontological
   b. Comparative anatomy (LQ)
   c. Embryology (LQ)
   d. Molecular evidence
3. Darwinism (LQ)
4. Modern Synthetic theory of Evolution
5. Mechanism of evolution
   a. Variation (Mutation and Recombination)
   b. Natural Selection with examples, types of natural selection
   c. Gene flow and genetic drift
   d. Hardy-Weinberg's principle
   e. Adaptive Radiation
6. Human evolution (in brief)

B08BHW Biology and Human Welfare

B44 BHHD Human health and disease — Aspire Science Higher Secondary School

1. Pathogens and parasites causing human diseases (Malaria, Filariasis, Ascariasis, Typhoid, Pneumonia, common cold, amoebiasis, ring worm)
2. Basic concepts of immunology- vaccines
3. Cancer, HIV and AIDS
4. Adolescence, drug and alcohol abuse

B11EXAM Examination

B56 BDIA Diagrams — Aspire Science Higher Secondary School

Diagrams

B57 BMIX Mixed type of TopicID. — Aspire Science Higher Secondary School

Mixed type of TopicID. Meant for a long question which has short question as bits and Column Matching Type questions.

B21PRA Practicals

B84 BASA Study of action of salivary amylase on starch — Aspire Science Higher Secondary School

Study of action of salivary amylase on starch and effect of pH and Temperature

B86 BSMT Study of Mendelian Traits — Aspire Science Higher Secondary School

To study the prepared pedigree charts of genetic traits in man such as rolling of tongue, blood groups, widow's peak and colour blindness.

B87 BSPW Study of pH of water — Aspire Science Higher Secondary School

To determine the pH of three water samples collected from water bodies (using pH paper).

B88 BVPS Study of Vertebrate specimen or parasite specimen/slides — Aspire Science Higher Secondary School

1. Study of specimens and identification with reasons- Shark, Rohu, Frog, Garden lizard, Cobra, Krait, Pigeon and Rat. (Spottings)
2. Identification of common disease causing organisms- Entamoeba, Plasmodium, Taenia, Ascaris and Ringworm (permanent slides/ specimens). Comment on the symptoms of the diseases they cause. (Spottings)

B89 BSHS Study of histological slides of organs — Aspire Science Higher Secondary School

Study of TS/ VS through spinal cord, ovary, testis, artery, vein, kidney, stomach and blastula of frog (Spottings)

B90 BTUS Test for Urea and sugar — Aspire Science Higher Secondary School

To test the presence of urea and sugar in urine/ given sample solution.

B91 BSKE Study of human skeleton — Aspire Science Higher Secondary School

Study of Axial and appendicular skeleton of rabbit (excluding skull)

Chemistry

C02SM Different States of Matter

C03 CSLD Solid State — Aspire Science Higher Secondary School

1. Classification of solids based on different binding forces: molecular, ionic, covalent and metallic solids
2. Amorphous and crystalline solids (elementary idea)
3. Unit cell in two dimensional and three dimensional lattices
4. Calculation of density of unit cell, packing in solids, packing efficiency, voids, number of atoms per unit cell in a cubic unit cell, point defects, electrical and magnetic properties.
5. Band theory of metals, conductors, semiconductors and insulators and n & p type semiconductors.

C04 CLIQ Liquid State and Solution — Aspire Science Higher Secondary School

First Year Portion
1. Liquid State, vapour pressure, viscosity and surface tension (qualitative idea only, no mathematical derivations).
Second Year Portion
1. Types of solutions: Expression of concentration of solutions of solids in liquids, solubility of gases in liquids and solid solutions
2. Colligative properties: relative lowering of vapour pressure, Raoult's law, elevation of boiling point, depression of freezing point, osmotic pressure, determination of molecular masses using colligative properties, abnormal molecular mass, van't Hoff factor

C05 CCOL Colloidal State and Surface Chemistry — Aspire Science Higher Secondary School

1. Adsorption - physisorption and chemisorption, factors affecting adsorption of gases on solids
2. Catalysis, homogenous and heterogenous activity and selectivity; enzyme catalysts
3. Colloidal state - Distinction between true solutions,colloids and suspension; lyophilic, lyophobic multimolecular and macromolecular colloids; properties of colloids
4. Tyndall effect, Brownian movement, electrophoresis, coagulation
5. Emulsion - types of emulsions

C04CR Chemical Reaction

C12 CKIN Chemical Kinetics — Aspire Science Higher Secondary School

1. Rate of a reaction (Average and instantaneous)
2. Factors affecting rate of reaction: concentration, temperature, catalyst
3. Order and molecularity of a reaction
4. Rate law and specific rate constant
5. Integrated rate equations and half life (only for zero and first order reactions)
6. Concept of collision theory (elementary idea, no mathematical treatment)
7. Activation energy
8. Arrhenius equation.

C05MET Metal and Metallurgy

C13 CMLG Metallurgy — Aspire Science Higher Secondary School

1. Principles and methods of extraction - concentration, oxidation, reduction - electrolytic method and refining
2. Occurrence and principles of extractionof aluminium, copper, zinc and iron.

C06FAM Families

C18 CNIT Nitrogen Family — Aspire Science Higher Secondary School

1. Group15 Elements: General introduction, electronic configuration, occurrence, oxidation states, trends in physical and chemical properties
2. Nitrogen - preparation properties and uses; compounds of nitrogen, preparation and properties of ammonia and nitric acid, oxides of nitrogen (Structure only)
3. Phosphorus - allotropic forms, compounds of phosphorus: preparation and properties of phosphine, halides PCl3, PCl5 and oxoacids (elementary idea only).

C19 COXY Oxygen Family — Aspire Science Higher Secondary School

1. Group 16 Elements: General introduction, electronic configuration, oxidation states, occurrence, trends in physical and chemical properties
2. Dioxygen: Preparation, Properties and uses
3. Classification of oxides
4. Ozone
5. Sulphur - allotropic forms
6. Compounds of sulphur: Preparation properties and uses of sulphur - dioxide
7. Sulphuric acid: industrial process of manufacture, properties and uses
8. Oxoacids of sulphur (Structures only).

C20 CHAL Halogen Family — Aspire Science Higher Secondary School

1. Group 17 Elements: General introduction, electronic configuration, oxidation states, occurrence, trends in physical and chemical properties
2. Compounds of halogens
3. Preparation properties and uses of chlorine and hydrochloric acid
4. Interhalogen compounds
5. Oxoacids of halogens (structure only)

C21 CZGE Zero Group Elements — Aspire Science Higher Secondary School

Group 18 Elements: General introduction,electronic configuration, occurrence, trends in physical and chemical properties, uses.

C22 CTRA Transition Metals — Aspire Science Higher Secondary School

d and f Block Elements
1. General introduction, electronic configuration, occurrence and characteristics of transition metals
2. General trends in properties of the first row transition metals - metallic character, ionization enthalpy, oxidation states, ionic radii, colour, catalytic property, magnetic properties, interstitial compounds, alloy formation,
3. Preparation and properties of K2cr2O7 and KMnO4.
4. Lanthanoids - Electronic configuration, oxidation states, chemical reactivity and lanthanoid contraction and its consequences.
5. Actinoids - Electronic configuration, oxidation states, chemical reactivity and lanthanoid contraction and its consequences. Comparison with lathanoids.

C07ENC Electro, Nuclear and Coordination Chemistry

C23 CELE Electrochemistry — Aspire Science Higher Secondary School

Redox reactions, electrolytes and non-electrolyte conductor, conductance in electrolytic solutions, specific and molar conductivity, variation of conductivity with concentration, Kohlrausch's law, electrolysis and laws of electrolysis (elementary idea), dry cell electrolytic cells and Galvanic cells, lead accumulator, EMF of a cell, standard electrode potential, Nernst equation and its application to chemical cells, Relation between Gibbs energy change and emf of a cell, fuel cells, corrosion.

C25 CCOO Coordination Chemistry — Aspire Science Higher Secondary School

1. Coordination compounds - Introduction, ligands, coordination number, colour, magnetic properties and shapes
2. IUPAC nomenclature of mononuclear coordination compounds.
3. Bonding, Werner's therory, VBT and CFT
4. Structure and stereoisomerism, importance of coordination compounds (in qualitative analysis, extraction of metals and biological system).

C10DHC Derived Hydrocarbons

C33 CHHC Haloalkanes and haloaranes — Aspire Science Higher Secondary School

Haloalkanes: Nomenclature, nature of C-X bond, physical and chemical properties, mechanism of substitution reactions, optical rotation.
Haloarenes: Nature of C - X bond, substitution reactions (Directive influence of halogen in monosubstituted compounds only. Uses and environmental effects of - dichloromethane, trichloromethane, tetrachloromethane, iodoform, freons, DDT, BHC.

C34 CALC Alcohols — Aspire Science Higher Secondary School

Alcohols: Nomenclature, methods of preparation, physical and chemical properties (of primary alcohols only), identification of primary, secondary and tertiary alcohols, mechanism of dehydration, uses with special reference to methanol and ethanol.
Phenols: Nomenclature, methods of preparation, physical and chemical properties, acidic nature of phenol, electrophillic substitution reactions and uses of phenols.
Ethers :Nomenclature, methods of preparation, physical and chemical properties and uses.

C35 CALD Aldehydes and Ketones — Aspire Science Higher Secondary School

Aldehydes and Ketones : Nomenclature, nature of carbonyl group, methods of preparation, physical and chemical properties, mechanism of nucleophillic addition, reactivity of alpha hydrogen in aldehydes and uses.

C36 CMCA Monocarboxyllic acids — Aspire Science Higher Secondary School

Carboxylic Acids : Nomenclature, acidic nature, methods of preparation, physical and chemical properties and uses.

C38 CANC Aliphatic Nitrogen Compounds — Aspire Science Higher Secondary School

1. Amines : Nomenclature classification, structure, methods of preparation, physical and chemical proporties and uses.
2. Identification of primary, secondary and teritary amines.
3. Cyanide and Isocyanides - will be mentioned at relevant places in context.
4. Diazonium salt - Preparation, chemical reactions and importance in synthetic organic chemistry.

C12BIO Biomolecules

C42 CBIO Biomolecules — Aspire Science Higher Secondary School

1. Carbohydrates - Classification (aldoses and ketoses)
   a. Monosaccahrides(glucose and fructose), D-L configuration
   b. Oligosaccharides(sucrose, lactose, maltose)
   c. Polysaccharides(starch, cellulose, glycogen)
   d. Importance
2. Proteins-Elementary idea of alpha - amino acids, peptide bond, polypeptide, proteins,
   a. Structure of proteins - primary, secondary, teritary structure and quaternary structure(qualitative idea only)
   b. Denaturation of proteins
3. Enzymes
4. Hormones-Elementary idea excluding structure
5. Vitamins-Classification and functions
6. Nucleic Acids : DNA and RNA

C13CSH Chemistry in Service of Humanity

C43 CCSH Chemistry in Service of Humanity — Aspire Science Higher Secondary School

1. Chemical in Medicines- Analgesics, tranqulizers, antiseptics, disinfectants, antimicrobials, antifertility drugs, antibiotics, antacids, antihistamines.
2. Chemical in food preservations, artificial sweetening agents, elementary idea of antioxidants
3. Clensing agents - Soap and detergents, cleansing action

C46 CPOL Polymers — Aspire Science Higher Secondary School

1. Classification-Natural and synthetic
2. Methods of polymerization (addition and condensation) co-polymerization
3. Some important polymers - natural and synthetic like polythene, nylon, polyester, bakelite, rubber
4. Biodegradable and non-biodegradable polymers.

C15PRA Practicals

C73 CPCS Preparation of crystalline salts — Aspire Science Higher Secondary School

Crystallisation
1. Preparation of Mohr's Salt ($FeSO_4$, $(NH_4)_2SO_4$, $6H_2O$] crystal
2. Preparation of potash alum [K_2SO_4, $Al_2(SO_4)_3$, $24H_2O$] crystal

C74 CQAX Quantitative analysis — Aspire Science Higher Secondary School

Quantitative analysis
1. Double titration: Two experiments to be done
   a. One acid two alkalies double titration
   b. Two acids one alkali double titration.
2. Bench acid Titration: Strong acid of approximately 20. N to be supplied
3. Redox Titration: Titration between potassium permanganate and oxalic acid.

C75 CIBR Identification of basic radicals by dry and wet test — Aspire Science Higher Secondary School

1. Wet tests for basic radicals: Wet tests for the following basic radicals be done.
 a. Group – I basic radicals: Ag^+, Pb^{2+}, Hg_2^{2+}
 b. Group – II basic radicals: Hg^{2+}, Cu^{2+}, Bi^{3+}, As^{3+}, Sb^{3+}, Sn^{2+} and Sn^{4+}
 c. Group – III A basic radicals: Fe^{3+}, Al^{3+} and Cr^{3+}
 d. Group – III B basic radicals: Co^{2+}, Ni^{2+}, Zn^{2+}, and Mn^{2+}
 e. Group – IV basic radicals: Ba^{2+}, Ca^{2+}, and Sr^{2+}
 f. Group – V basic radicals: NH_4^+, Mg^{2+}, K^+, Na^+
2. Identification of unknown basic radicals: For identification of unknown basic radicals both dry and wet tests are to be performed

C76 CTFG Test for functional groups present in organic compounds — Aspire Science Higher Secondary School

Qualitative organic analysis
1. Test for unsaturation
2. Distinction between aromatic and aliphatic compounds (copper foil test)
3. Test for carboxylic, phenolic, aldehydic, ketonic and alcoholic groups.

English

N01PRO Prose

N67 NGOP My Greatest Olympic Prize — Aspire Science Higher Secondary School

My Greatest Olympic Prize

N68 NEXA On Examinations — Aspire Science Higher Secondary School

On Examinations

N69 NTPL The Protrait of a Lady — Aspire Science Higher Secondary School

The Protrait of a Lady

N70 NTMT The Magic of Teamwork — Aspire Science Higher Secondary School

The Magic of Teamwork

N71 NDPV Development of Polio Vaccines — Aspire Science Higher Secondary School

Development of Polio Vaccines

N02POE Poetry

N77 NDAF Daffodils — Aspire Science Higher Secondary School

Daffodils

N78 NBFG The Ballad of Father Gilligan — Aspire Science Higher Secondary School

The Ballad of Father Gilligan

N79 NPOL A Psalm of Life — Aspire Science Higher Secondary School

A Psalm of Life

N80 NTEL Television — Aspire Science Higher Secondary School

Television

N81 NMMX Money Madness — Aspire Science Higher Secondary School

Money Madness

N03NDS Non-detailed Study

N88 NTDW The Doctor's Word — Aspire Science Higher Secondary School

The Doctor's Word

N89 NTNR The Nightingale and the Rose — Aspire Science Higher Secondary School

The Nightingale and the Rose

N90 NMMC Mystery of the Missing Cap — Aspire Science Higher Secondary School

Mystery of the Missing Cap

N91 NTMP The Monkey's Paw — Aspire Science Higher Secondary School

The Monkey's Paw

N92 NMMO My Mother — Aspire Science Higher Secondary School

My Mother

N93 NSHS Stay Hungry. Stay Fit. — Aspire Science Higher Secondary School

Stay Hungry. Stay Fit.

N04SW Steps to Writing

N38 NIGC Interpreting Graphs, Charts etc — Aspire Science Higher Secondary School

Interpreting Graphs, Charts, Tables and Diagrams etc

N39	**NREB**	Reporting events and Business Matters	Aspire Science Higher Secondary School

Reporting events and Business Matters

N40	**NNMS**	Note Making and Summarizing	Aspire Science Higher Secondary School

Note Making and Summarizing

N41	**NEWX**	Extended Writing	Aspire Science Higher Secondary School

Extended Writing

N05GCT Grammar in Context and Translation

N47	**NINT**	Interrogatives	Aspire Science Higher Secondary School

Interrogatives

N49	**NRTM**	Revision of Tense Pattern and Modal Verbs	Aspire Science Higher Secondary School

Revision of Tense Pattern and Modal Verbs

N51	**NPAS**	The Passive	Aspire Science Higher Secondary School

The Passive

N52	**NCON**	Conditionals	Aspire Science Higher Secondary School

Conditionals

N53	**NDRS**	Direct and Reported Speech	Aspire Science Higher Secondary School

Direct and Reported Speech

N54	**NPVX**	Phrasal Verbs	Aspire Science Higher Secondary School

Phrasal Verbs

N06EXAM Examination

N55	**NVOC**	Vocabulary Skills	Aspire Science Higher Secondary School

Vocabulary Skills

N57	**NDIC**	Dictionary/Reference Skills	Aspire Science Higher Secondary School

Dictionary/Reference Skills

N59	**NGIC**	Grammar in Context	Aspire Science Higher Secondary School

Grammar in Context

N60	**NUSP**	Unseen Passage	Aspire Science Higher Secondary School

Unseen Passage

N61	**NESS**	Essay writing	Aspire Science Higher Secondary School

Essay writing

Information Technology

I01IT IT and its application

I40 IEBX E-business — Aspire Science Higher Secondary School

1. Definition
2. E-commerce and its type with benefits
3. E-business websites and their salient features and Social impacts
4. E business challenges.

I41 IFEI Front-end Interface — Aspire Science Higher Secondary School

1. Introduction
2. Content and Features
3. Identifying and using appropriate components (Text Box, Radio Button, Check Box, List etc.) for data entry, validation and display

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I42 IFED Front-end and Database connectivity — Aspire Science Higher Secondary School

Introduction, requirement and benefits

I43 IBED Back - end database IBED — Aspire Science Higher Secondary School

1. Introduction and its purpose
2. Exploring the requirement of databases, table and its essential attributes.

I44 IDOD Development of database — Aspire Science Higher Secondary School

Demonstration and development of appropriate front – end interface and back - end database for e - governance applications.

I04NW Networking

I08 ICOM Computer Networking — Aspire Science Higher Secondary School

1. Networking - a brief overview
2. Communication Media,
   a. Wired Technologies (Coaxial, Ethernet cable, optical fiber)
   b. Wireless Technologies [Bluetooth, Infrared, Microwave, Radio Link, Satellite link]
3. Network devices (Hub, Switch, Bridge, Router, Repeater, Gateway) & their functions
4. Type of Network (LAN, MAN, WAN, PAN) Network
5. Topologies (Star, Ring, Bus, Tree)

I07DB Databases

I34 ISQL Introduction to MySQL — Aspire Science Higher Secondary School

A. First Year Portion
ANSI SQL 99 standard commands
1. Classification of SQL commands:
 a. DML (Select, Insert, Update, Delete)
 b. DDL(Create, Drop, Alter)
2. Creating & using a database (SQL Create command to create a database, Use command to select a database)
3. Creating a Table: CREATE command to create a table, DESC command to display a table structure, INSERT command for inserting new rows
4. Displaying table data: SELECT command to select all the columns, selecting specific columns using arithmetic operators (operator precedence)
5. Defining & using column alias, eliminating duplicate values from display using Distinct keyword
6. Limiting rows during selection using WHERE clause
 a. Using comparison operator (=, <, >, <=, >=, <>, BETWEEN, IN, LIKE (%,-))
 b. Using Logical operators (AND, OR, NOT & corresponding operator precedence)
B. Second Year Portion
1. Working with NULL value
2. ORDER BY CLAUSE: Sorting in ascending / descending order, sorting by column alias name, sorting on multiple column
3. Manipulating data of a table / relation: Update command to change existing data of a table, delete command for removing rows from a table
4. Restructuring a table: ALTER TABLE for adding new columns and deleting columns
5. String function: ASCII(), CHAR(), CONCAT(), INSTR(), LCASE(), UCASE (), LENGTH (), LTRIM(), MID(), RIGHT(), RTRIM(), TRIM(), SUBSTR()
6. Mathematical functions: POWER(), ROUND(), TRUNCATE()
7. Date & Time functions: CURDATE(), DATE(), MONTH(), DAYOFMONTH(), DAYOFWEEK(), DAYOFYEAR(), NOW(), SYSDATE()

I39 IDFX Database fundamentals — Aspire Science Higher Secondary School

1. Concept of Database Transaction: Committing and revoking a transaction using COMMIT and ROLLBACK
2. Grouping Records: GROUP BY; Group function [MAX (), MIN(), AVG(), SUM(), COUNT()]; Using COUNT (*); DISTINCT clause with COUNT; group function and NULL value
3. Displaying data from multiple tables [Cartesian product, Union, Equi-join].

I08IN Internet and its application

I12 INET Introduction to Internet — Aspire Science Higher Secondary School

1. Internet - an Overview
2. Internet Backbone
3. Internet Access (Dial-up, direct, Broadband connection)
4. Role of ISP
5. Internet Protocols (TCP/IP, HTTP, FTP, TELNET, WAIS, GOPHER)
6. Internet Addressing (IP Address, Domain names), MAC (Media Access Control), URL, E-mail Address
7. Internet Application (www, websites & web pages, Email, SMS, voice mail, chatting, IRC, Video conferencing, web browsers, search Engine)
8. Wireless/mobile communication (GSM, CDMA, WLL, 3G, 4G)

I20 ISSI Network Security on Internet — Aspire Science Higher Secondary School

1. Threats and prevention from virus
2. Use of cookies, Firewall, use of digital signature
3. Cyber crimes (Hacking, on-line fraud, pornography, snooping, spooling, cyber stalking, software piracy)
4. Cyber Laws.

I10IP Introduction to Programming

I32 IPFX Programming Fundamentals — Aspire Science Higher Secondary School

A. First Year Portion
1. Data types: Concept of data types; Built in data types - byte, short, int, long, float, double, char, string and boolean
2. Variables, declaring variables, naming a variable, assigning value to variables
3. integer object method (parse int); double object method (parse double, parse float); Control structure
4. Decision structure (if, if….else, switch)
5. Looping structure (while, Do-While, for)

B. Second Year Portion
1. Basic concept of access specifier for class member [data member and methods] and inheritance
2. Commonly used libraries
   a. String class and methods: toString(), concat(), length(), toLowerCase(), toUpperCase(), trim(), substring ()
   b. Math class and methods: pow(), round()
3. Accessing MySQL database using ODBC, JDBC to connect with database.

I38 IWPT HTML based web page covering basic tag — Aspire Science Higher Secondary School

1. HTML, DHTML, TITLE, BODY, H1 .. H6, Paragraph (P) Line break (BR), Section separator (HR), FONT, TABLE, LIST (UL, OL), FORM
2. Creating and Accessing static and dynamic pages using HTML, DHTML
3. Introduction to XML.

I20PRA Practicals

I73 IPSJ Problem solving using JAVA — Aspire Science Higher Secondary School

A. First Year Portion
10 problems with solution to be conducted and attached to the practical record
B. Second Year Portion
At least 12 solution of simple problem using IDE based java.

I75 IPSS SQL queris — Aspire Science Higher Secondary School

A. First Year Portion
15 SQL queries to be made and result may be added to the practical record
B. Second Year Portion
At least 24 SQL queries on one and / or two tables.

I76 IPSF IT application — Aspire Science Higher Secondary School

A. First Year Portion
IT application: 3 problem solving frame work; to be attached to practical record.
B. Second Year Portion
Solution of at least 2 simple problem incorporating java application & database connectivity.

I77 IWCH Web-page creation by HTML — Aspire Science Higher Secondary School

At least two web pages creating using HTML

I78 IPRO Project work — Aspire Science Higher Secondary School

Students in group of 2/3 are required to work collaboratively to develop a project using programming and database skills. This project should be an application in any one of the following domain:
a) E-governance
b) E-business
c) E-learning
With GUI front-end and corresponding database at the back-end

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Mathematics

M02NS Number System

M29 MLPP Linear Programming Problem — Aspire Science Higher Secondary School

1. Introduction
2. Related terminology such as constraints, objective function, optimization
3. Different types of linear programming (L.P.) problems
4. Mathematical formulation of L.P. problems
5. Graphical method of solution for problems in two variables
6. Feasible and infeasible regions (bounded and unbounded)
7. Feasible and infeasible solutions
8. Optimal feasible solutions (up to three non-trivial constraints)

M03RF Relation and Function

M03 MREL Relation — Aspire Science Higher Secondary School

A. First Year Portion:
1. Ordered pairs, Cartesian product of sets. Number of elements in the Cartesian product of two finite sets. Cartesian product of the sets of real (upto R × R).
2. Definition of relation and Pictorial diagrams
3. Domain, co-domain and range of a relation.
B. Second Year Portion:
1. Types of relations: Reflexive, symmetric, transitive and equivalence relations.

M04 MFUN Function — Aspire Science Higher Secondary School

A. First Year Portion:
1. Function as a special kind of relation from one set to another.
2. Pictorial representation of a function, domain, co-domain and range of a function.
3. Real valued functions
4. Domain and range of these functions: Constant, identity, polynomial, rational, modulus, signum, exponential, logarithmic and greatest integer function, with their graphs.
5. Sum, difference, product and quotients of functions.
B. Second Year Portion
1. One to one and onto functions, composite functions, inverse of function.
2. Binary operations.

M04Trig Trigonometry

M05 MTRI Trigonometry — Aspire Science Higher Secondary School

A. First Year Portion: Trigonometric Functions
1. Positive and negative angles.
2. Measuring angles in radians and in degrees and conversion of one into other.
3. Definition of trigonometric functions with the help of unit circle.
4. Truth of $\sin 2x + \cos 2x = 1$, for all x.
5. Signs of trigonometric functions.
6. Domain and range of trigonometric functions and their graphs.
7. Expressing $\sin(x \pm y)$ and $\cos(X \pm y)$ in terms of sinx, siny, cosx & cosy and their simple application.
8. Deducing identities like the following : [Check original courses of studies]
9. Identities related to sin 2x, cos 2x, tan 2x, sin 3x, cos 3x and tan 3x.
10. Trigonometric equations; Principal solution
11. General solution of trigonometric equations of the type sin x = sin y, cos x = cos y and tan x = tan y.
12. Proof and Simple applications of sine and cosine formula.
B. Second Year Portion: Inverse Trigonometric Functions
1. Definition, range, domain, principle value branch.
2. Graphs of inverse trigonometric functions.
3. Elementary properties of inverse trigonometric functions.

M06DCAL Differential Calculus

M16 MDIF Derivatives — Aspire Science Higher Secondary School

A. First year Portion
1. Derivative introduced as rate of change both as that of distance function and geometrically.
2. Definition of derivative, relate it to slope of tangent of a curve
3. Derivative of sum, difference, product and quotient of functions
4. The derivative of polynomial and trigonometric functions
B. Second year Portion
1. Continuity and differentiability
2. Derivative of composite functions, chain rule
3. Derivatives of inverse trigonometric functions
4. Derivative of implicit functions
5. Concept of exponential and logarithmic functions.
6. Derivatives of logarithmic and exponential functions
7. Logarithmic differentiation
8. Derivative of functions expressed in parametric forms.
9. Second order derivatives.
10. Rolle's and Lagrange's Mean Value Theorems (without proof) and their geometric interpretation.

M17 MADX Application of Derivatives — Aspire Science Higher Secondary School

1. Rate of change of bodies
2. Increasing and decreasing functions
3. Tangents and normals
4. Use of derivatives in approximation
5. Maxima and minima (first derivative test motivate geometrically and second derivative test given as a probable tool).
Simple problems (that illustrate basic principles and understanding of the subject as well as real-life situations).

M07ICAL Integral Calculus

M18 MAND Antiderivative (Indefinite Integral) — Aspire Science Higher Secondary School

1. Integration as inverse process of differentiation.
2. Integration of a variety of functions
  a. by substitution
  b. by partial fractions
  c. by parts
3. Evaluation of simple integrals of the following types and problems based on them.
(See orginal Courses of Studies by CHSE/CBSE)

M19 MDIX Definite Integral — Aspire Science Higher Secondary School

1. Definite integrals as a limit of a sum
2. Fundamental Theorem of Calculus (without proof).
3. Basic properties of definite integrals and evaluation of definite integrals.
4. Applications of the Integrals: Applications in finding the area under simple curves, especially lines/circles/parabolas/ellipses (in standard form only). Area between any of the two above said curves (the region should be clearly identifiable).

M20 MDEQ Differential Equation — Aspire Science Higher Secondary School

1. Definition, orders, degrees, general and particular solution of a differential equation.
2. Formation of differential equations whose general solution is given.
3. Solutions of differential equations by method of Separtion of Variables
4. Solutions of homogenous differential equations of first order and first degree
5. Solutions of linear differential equation of the form $dy/dx + py = q$ where p and q are functions of x or constants and $dx/dy + px = q$, where p and q are functions of y or constants.

M08CGV 3D Co - ordinate Geometry and Vector

M21 MTSL 3D Straight Line — Aspire Science Higher Secondary School

A. First Year Portion
1. Coordinate axes and coordinate planes in three dimensions.
2. Coordinates of a point in three dimensions.
3. Distance between two points and section formula.
B. Second Year Portion
1. Direction cosines and direction ratios of a line joining two points.
2. Cartesian equation and vector equation of a line
3. Coplanar and skew lines
4. Shortest distance between two lines.
5. Cartesian and vector equation of a plane.
6. Angle between (i) two lines, (ii) two planes, (iii) a line and a plane.
7. Distance of a point from a plane.

M23 MVEC Vector — Aspire Science Higher Secondary School

1. Vectors and scalars
2. Magnitude and direction of a vector
3. Direction cosines and direction ratios of a vector
4. Types of vectors (equal, unit, zero, parallel and collinear vectors)
5. Position vector of a point
6. Negative of a vector
7. Components of a vector
8. Addition of vectors
9. Multiplication of a vector by a scalar
10. Position vector of a point dividing a line segment in a given ratio
11. Definition, Geometrical Interpretation, properties and application of
   a. scalar (dot) product of vectors
   b. vector (cross) product of vectors
   c. scalar triple product of vectors
12. Coplanarity of three vectors

M09DM Determinants and Matrices

M10 MDET Determinants — Aspire Science Higher Secondary School

1. Determinant of a square matrix (up to 3 × 3 matrices)
2. Properties of determinants: Minors, cofactors and applications of determinants in finding the area of a triangle
3. Adjoint and inverse of a square matrix
4. Consistency, inconsistency and number of solutions of system of linear equations by examples
5. Solving system of linear equations in two or three variables (having unique solution) using inverse of a matrix

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M11 MMAT Matrices — Aspire Science Higher Secondary School

1. Concept, notation, order, equality
2. Types of matrices, zero and identity matrix
3. Transpose of a matrix, symmetric and skew symmetric matrices.
4. Operation on matrices: Addition and multiplication and multiplication with a scalar
5. Simple properties of addition, multiplication and scalar multiplication.
6. Non commutativity of multiplication of matrices and existence of non-zero matrices whose product is the zero matrix (restrict to square matrices of order 2)
7. Concept of elementary row and column operations.
8. Invertible matrices and proof of the uniqueness of inverse, if it exists; (Here all matrices will have real entries).

M11PS Probability and Statistics

M24 MPRO Probability — Aspire Science Higher Secondary School

A. First Year Portion
1. Random experiments; outcomes, sample spaces (set representation)
2. Events: occurrence of events, 'not', 'and' and 'or' events, exhaustive events, mutually exclusive events, Axiomatic (set theoretic) probability, connections with the theories of earlier classes
3. Probability of an event
4. Probability of 'not', 'and' 'or' events
B. Second Year Portion
Conditional probability, multiplication theorem on probability. Independent events, total probability, Baye's theorem, Random variable and its probability distribution, mean and variance of random variable. Independent (Bernoulli) trials and Binomial distribution

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Odia

O01Pro Odia Prose

O21 OITI ଇତିହାସ — Aspire Science Higher Secondary School

ଇତିହାସ

O22 OSDS ସ୍ୱାଧୀନ ଦେଶର ଶିକ୍ଷା ଚିନ୍ତା — Aspire Science Higher Secondary School

ସ୍ୱାଧୀନ ଦେଶର ଶିକ୍ଷା ଚିନ୍ତା

O23 OPBB ପୁଷ୍ପପୁରରେ ବର୍ଷାବରଣ — Aspire Science Higher Secondary School

ପୁଷ୍ପପୁରରେ ବର୍ଷାବରଣ

O24 OTTX ତିନି ତୁଣ୍ଡରେ — Aspire Science Higher Secondary School

ତିନି ତୁଣ୍ଡରେ

O02Poe Odia Poetry

O25 OBAD ବଡପଣ — Aspire Science Higher Secondary School

ବଡପଣ

O26 OTPX ତପସ୍ୱିନୀର ପତ୍ର — Aspire Science Higher Secondary School

ତପସ୍ୱିନୀର ପତ୍ର

O27 OBBB ବନ୍ଦୀର ବିରହ ବ୍ୟଥା — Aspire Science Higher Secondary School

ବନ୍ଦୀର ବିରହ ବ୍ୟଥା

O28 OBAR ବାର୍ତ୍ତା — Aspire Science Higher Secondary School

ବାର୍ତ୍ତା

O29 OPAX ପିଙ୍ଗଳାର ଅଭିସାର — Aspire Science Higher Secondary School

ପିଙ୍ଗଳାର ଅଭିସାର

O04Gra Odia Grammar and Essay

O16 ODPL ଦରଖାସ୍ତ ଓ ପତ୍ର ଲିଖନ — Aspire Science Higher Secondary School

ପ୍ରଥମ ବର୍ଷ
ସାଧାରଣ ପତ୍ରଲିଖନ
ଦ୍ୱିତୀୟ ବର୍ଷ
ଦରଖାସ୍ତ ଲିଖନ: ବ୍ୟବସାୟିକ, ବ୍ୟକ୍ତିଗତ, ବୃତ୍ତି ନିମିତ୍ତ, ସରକାରୀ କାର୍ଯ୍ୟାଳୟ ସମ୍ବନ୍ଧୀୟ ଓ ସାମୟିକ ଛୁଟି ପାଇଁ
ପତ୍ରଲିଖନ: ସମ୍ପାଦକଙ୍କୁ ପତ୍ର

O37 OSKX ସଂକ୍ଷିପ୍ତକରଣ — Aspire Science Higher Secondary School

ସଂକ୍ଷିପ୍ତକରଣ
ସଂକ୍ଷିପ୍ତକରଣ ନିମନ୍ତେ ଏକ ଗଦ୍ୟ ଅନୁଚ୍ଛେଦ ଦିଆଯିବ । ସେଥିରୁ ପରୀକ୍ଷାର୍ଥୀ ଏକ ତୃତୀୟାଂଶ ଶବ୍ଦରେ ଉତ୍ତର ଦେବେ ।

O38 ORPX ରୂଢିକୁ ବାକ୍ୟରେ ପ୍ରୟୋଗ — Aspire Science Higher Secondary School

ରୂଢିକୁ ବାକ୍ୟରେ ପ୍ରୟୋଗ

O39 OEKA ଏକପଦିକରଣ — Aspire Science Higher Secondary School

ଏକପଦିକରଣ

O40 OSVS ସମୋଚ୍ଚାରିତ ଭିନ୍ନାର୍ଥବୋଧକ ଶବ୍ଦ — Aspire Science Higher Secondary School

ସମୋଚ୍ଚାରିତ ଭିନ୍ନାର୍ଥବୋଧକ ଶବ୍ଦ

O41 OBAS ବିପରିତାର୍ଥବୋଧକ ଶବ୍ଦ — Aspire Science Higher Secondary School

ବିପରିତାର୍ଥବୋଧକ ଶବ୍ଦ

O42 OBSX ଭ୍ରମ ସଂଶୋଧନ — Aspire Science Higher Secondary School

ଭ୍ରମ ସଂଶୋଧନ (ଶବ୍ଦ)

O05Com Odia comprehension

O13 OUSP ଅବବୋଧ ପରୀକ୍ଷଣ Aspire Science Higher Secondary School

ଅବବୋଧ ପରୀକ୍ଷଣ
କ. ଗଦ୍ୟାଂଶ - ଏକ ଗଦ୍ୟ ଅନୁଚ୍ଛେଦ ଦିଆଯିବ । ଏଥିରୁ 4 ଟି ୧ ନମ୍ବର ବିଶିଷ୍ଟ ଏବଂ ୩ ଟି ୨ ନମ୍ବର ବିଶିଷ୍ଟ ପ୍ରଶ୍ନ ପଡିବ।
ଖ. ପଦ୍ୟାଂଶ - ଗୋଟିଏ ଅଜ୍ଞାତ କବିତା ଦିଆଯିବ । ସେଥିରୁ ୫ ଟି ୧ ନମ୍ବର ବିଶିଷ୍ଟ ପ୍ରଶ୍ନ ପଡିବ ।

O05Sto Odia Story

O30 OSJX ସଜ୍ଜ ଜମିଦାର Aspire Science Higher Secondary School

ସଜ୍ଜ ଜମିଦାର

O31 OPUX ପତାକା ଉତ୍ତୋଳନ Aspire Science Higher Secondary School

ପତାକା ଉତ୍ତୋଳନ

O32 ORSX ରୂପନାରାୟଣ ସାହା Aspire Science Higher Secondary School

ରୂପନାରାୟଣ ସାହା

O33 OAKX ଆକାଶ କଇଁଚ Aspire Science Higher Secondary School

ଆକାଶ କଇଁଚ

O06CW Odia Creative Writing

O36 OSRX ସର୍ଜନାତ୍ମକ ରଚନା Aspire Science Higher Secondary School

ସର୍ଜନାତ୍ମକ ରଚନା
ରୂଢି, ପ୍ରବାଦ, ପ୍ରବଚନ ଓ ସୂକ୍ତି ଆଧାରିତ
(ରୂଢି, ପ୍ରବାଦ, ପ୍ରବଚନ ଓ ସୂକ୍ତି ଆଧାରିତ ସର୍ଜନାମୂଳକ ଲିଖନ ସମ୍ବନ୍ଧୀୟ 3 ଟି ପ୍ରଶ୍ନ ପଡିବ । ସେଥିରୁ ଗୋଟିଏ ପ୍ରଶ୍ନର ଉତ୍ତର ଦେବାକୁ ପଡିବ।)

Physics

P07EMS Electrostatics and Magnetostatics

P22 PEFP Electric Charge Field and Potential — Aspire Science Higher Secondary School

Electric charges and fields:
1. Electric charge and its quantization
   a. Conservation of charge
   b. Coulomb's law
   c. Force between two point charges
   d. Force between multiple charges
   e. Superposition principle, Continuous charge distribution.
2. Electric field due to a point charge
   a. Electric field lines
   b. Electric field due to a dipole at any point
   c. Torque on a dipole in uniform electric field
3. Electric flux
   a. Gauss's theorem (statement only)
   b. Its applications to find field due to
      i) Uniformly charged infinite plane sheet
      ii) Infinitely long straight wire and
      iii) Uniformly charged thin spherical shell (field inside and outside)
4. Electrostatic potential
   a. Electric potential
   b. Potential difference
   c. Electric potential due to a point charge
   d. Potential due to a dipole
   e. Potential due to a system of charges
   f. Equipotential surfaces
   g. Electrical potential energy of a system of two point charges and of electric dipole in an electrostatic field

P23 PCAP Capacitance and capacitors — Aspire Science Higher Secondary School

1. Conductors and insulators
2. Free charges and bound charges inside a conductor
3. Dielectrics and electric polarization
4. Capacitors and capacitance
5. Capacitance of a parallel plate capacitor with and without dielectric medium between the plates
6. Combination of capacitors in series and in parallel
7. Energy stored in a capacitor

P24 PMAG Magnetostatics — Aspire Science Higher Secondary School

1. Current loop as a magnetic dipole and its magnetic dipole moment
2. Magnetic dipole moment of a revolving electron
3. Magnetic field intensity due to a magnetic dipole (bar magnet) along its axis and perpendicular to its axis
4. Torque on a magnetic dipole (bar magnet) in a uniform magnetic field
5. Bar magnet as an equivalent solenoid
6. Magnetic field lines
7. Earth's magnetic field and magnetic elements
8. Para-, dia- and ferro- magnetic substances with examples
9. Electromagnets and factors affecting their strengths, permanent magnets

P08CE Current Electricity

P25 PCRD Current, Resistance and DC circuits — Aspire Science Higher Secondary School

1. Electric current, drift velocity, mobility and their relation with electric current
2. Ohm's law, electrical resistance, conductance, resistivity, conductivity, effect of temperature on resistance, V - I characteristics (linear and non-linear), electrical energy and power
3. Carbon resistors, colour code of carbon resistors
4. Combinations of resistors in series and parallel.
5. EMF and potential difference
   a. Internal resistance of a cell
   b. Combination of cells in series and parallel
6. Kirchhoff's laws and simple applications. Wheatstone bridge and meter bridge
7. Potentiometer-Principle and its applications to measure potential difference and for comparing EMF of two cells
   a. Measurement of internal resistance of a cell

P27 PDCM Magnetic effects of current — Aspire Science Higher Secondary School

1. Concept of magnetic field: Oensted's experiment
2. Biot-Savart law and its application to find magnetic field on the axis and at the centre of a current carrying circular loop
3. Ampere's law and its application to infinitely long straight wire; Straight and toroidal solenoid (qualitative treatment only)
4. Force on a moving charge in uniform magnetic and electric fields
5. Cyclotron
6. Force on a current carrying conductor in a uniform magnetic field
7. Force between two parallel current carrying conductors
8. Definition of ampere
9. Torque experienced by a current loop in uniform magnetic field
10. Moving coil galvanometer- its current sensitivity and conversion to ammeter and voltmeter

P09EIAC Electromagnetic induction and alternating current

P28 PEMI Electromagnetic induction — Aspire Science Higher Secondary School

1. Faraday' laws of electromagnetic induction
2. Induced EMF and current
3. Lenz's law
4. Eddy currents,
5. Self and mutual induction

P29 PACX Alternating current — Aspire Science Higher Secondary School

1. Alternating currents
2. Peak and RMS value of alternating current / voltage
3. Reactance and impedance
4. LC oscillation (qualitative idea only), LCR series circuit
5. Resonance, power in AC circuits, wattles current
6. A.C. generator and transformer
7. Basic idea of displacement current

P10OPT Optics

P30 PROX Ray optics — Aspire Science Higher Secondary School

1. Reflection of light
2. Spherical mirrors, mirror formula, lateral and longitudinal magnification,
3. Refraction of light, refractive index, its relation with velocity of light (formula only)
4. Total internal reflection and its applications, optical fibre
5. Refraction at spherical surfaces, thin lens formula, lens maker's formula
6. Magnification, power of lenses, combination of two thin lenses in contact, combination of a lens and a mirror
7. Refraction and dispersion of light through prism
8. Scattering of light: blue colour of sky and reddish appearance of sun at sunset and sunrise

P31 PWOX Wave optics — Aspire Science Higher Secondary School

1. Wave front, Huygen's principle
2. Reflection and refraction of plane wave at a plane surface using wavefronts
3. Proof of laws of reflection and refraction using Huygen's principle
4. Interference: Young's double slit experiment and expression for fringe width, coherent sources, sustained interference of light, diffraction due to a single slit, width of a central maximum
5. Polarization, plane polarized light, Brewster's law, uses of plane polarized light and polaroids.

P32 POIX Optical instruments — Aspire Science Higher Secondary School

1. Microscopes and telescopes (reflecting and refracting) and their magnifying powers
2. Resolving power of microscope and astronomical telescope (qualitative idea)

P11ANR Atomic Physics and Nuclear Physics

P33 PDNR Dual Nature of Radiation — Aspire Science Higher Secondary School

1. Dual nature of radiation
2. Photoelectric effect, Hertz and Lenard's observations
3. Einstein's photoelectric equation, particle nature of light.
4. Matter waves: Wave nature of particles, de-Broglie relation, Davisson- Germer experiment (only conclusions should be explained).

P34 PAPX Atomic Physics — Aspire Science Higher Secondary School

1. Alpha- particle scattering experiment
2. Rutherford's model of atom and its limitations
3. Bohr model
4. Energy levels
5. Hydrogen spectrum

P35 PNPX Nuclear physics — Aspire Science Higher Secondary School

1. Atomic nucleus, its composition, size, nuclear mass, nature of nuclear force,
2. Mass defect, binding energy per nucleon and its variation with mass number
3. Nuclear fission and fusion
4. Radioactivity: Alpha, beta and gamma particles/ rays and their properties
5. Radioactive decay law, half life and decay constant

P12SS Solids and Semiconductors

P36 PSSX Solids and semiconductors — Aspire Science Higher Secondary School

1. Energy bands in conductors, semiconductors and insulators (qualitative idea only)
2. p-type and n-type semiconductors
3. Semiconductor diode, V-I characteristics in forward and reverse bias; diode as a half and full wave rectifier (centre tap), efficiency (no derivation).
4. Special purpose p-n junction diodes: LED, photodiode, solar cell and Zener diode and their characteristics; Zener diode as a voltage regulator.
5. Junction transistor: Transistor action, Characteristics of transistor, transistor as an amplifier (Common Emitter configuration)
6. Basic idea of analog and digital signals
7. Logic gates (OR, AND, NOT, NAND and NOR)

P13SCOM Space communication

P37 PEMW Electromagnetic Waves — Aspire Science Higher Secondary School

1. Qualitative idea about characteristics of electromagnetic waves, their transverse nature.
2. Electromagnetic spectrum (radio waves, microwaves, infrared, visible, Ultra violet, X-ray and gamma rays), including elementary ideas about their uses.

P38 PCOM Principles of Communication — Aspire Science Higher Secondary School

1. Elements of a communication system (block diagram only)
2. Bandwidth of signals (speech, TV and digital data)
3. Bandwidth of transmission medium
4. Propagation of electromagnetic waves in the atmosphere
5. Sky and space wave propagation, satellite communication
6. Need for-modulation: qualitative idea about amplitude modulation and frequency modulation, advantages of frequency modulation over amplitude modulation
7. Basic idea about internet, mobile telephony and global positioning system (GPS)

P20PPRA Practicals

P73 PRES Resistance — Aspire Science Higher Secondary School

1. To determine resistance per cm of a given wire by plotting a graph for potential difference versus current.
2. To find resistance of a given wire using metre bridge and hence determine the resistivity of its material.
3. To verify the laws of combination (series) of resistances using a metre bridge.
4. To verify the laws of combination (parallel) of resistances using a metre bridge.

P74 PEIC EMF and Internal resistance of Cells — Aspire Science Higher Secondary School

1. To compare the EMF of two given primary cells using potentiometer.
2. To determine the internal resistance of given primary cell using potentiometer.

P75 PGAL Galvanometer — Aspire Science Higher Secondary School

1. To determine resistance of a galvanometer by half-defliction method and to find its figure of merit.
2. To convert the given galvanometer (of known resistance and figure of merit) into a voltmeter of desired range and to verify the same.
3. To convert the given galvanometer (of known resistance and figure of merit) into an ammeter of desired range and to verify the same.

P76 PFAC Frequency of AC line — Aspire Science Higher Secondary School

1. To find the frequency of the ac mains with a sonometer.

P77 POPT Optics Aspire Science Higher Secondary School

1. To find the value of V for different values of u in case of a concave mirror and to find the focal length.
2. To find the focal length of a convex mirror, using a convex lens.
3. To find the focal length of a convex lens by plotting graphs between u and v or between 1/u and 1/v.
4. To find the focal length of a concave lens, using a convex lens.
5. To determine angle of minimum deviation for a given prism by plotting a graph between the angle of incidence and the angle of deviation.
6. To determine refractive index of a glass slab using a travelling microscope.
7. To find refractive index of a liquid by using convex lens and plane mirror.

P78 PSEM Semiconductor Aspire Science Higher Secondary School

1. To draw the I-V characteristic curve of a P-n junction in forward bias and reverse bias.
2. To draw the characteristic curve of a zener diode and to determine its reverse breakdown voltage.
3. To study the characteristics of a common-emitter npn or pnp transistor and to find out the values of current and voltage gains.