

**ANNUAL**  
**CURRICULUM**  
**PLAN**

**CLASS XI SCIENCE**

**(SESSION: 2015-16)**

## **WHERE THE MIND IS WITHOUT FEAR**

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*Where the mind is without fear and the head is held high*

*Where knowledge is free*

*Where the world has not been broken up into fragments*

*By narrow domestic walls*

*Where words come out from the depth of truth*

*Where tireless striving stretches its arms towards perfection*

*Where the clear stream of reason has not lost its way*

*Into the dreary desert sand of dead habit*

*Where the mind is led forward by thee*

*Into ever-widening thought and action*

*Into that heaven of freedom, my Father, let my country awake.*

*- Rabindranath Tagore*

## LIST OF HOLIDAYS

1. Good Friday	03.04.15	Friday
2. Dr. Ambedkar Jayanti	14.04.15	Tuesday
3. Buddh Purnima	04.05.15	Monday
4. Id -Ul- Fitr	18.07.15	Saturday
5. Independence Day	15.08.15	Saturday
6. Teej	17.08.15	Monday
7. Raksha Bandhan	29.08.15	Saturday
8. Janamashtami	05.09.15	Saturday
9. Id-Ul-Zuha	24.09.15	Thursday
10. Gandhi Jayanti	02.10.15	Friday
11. Dussehra	22.10.15	Thursday
12. Muharram	24.10.15	Saturday
13. Karwa Chauth	30.10.15	Friday
14. Haryana Day	01.11.15	Sunday
15. Diwali	11.11.15	Wednesday
16. Goverdhan Puja	12.11.15	Thursday
17. Bhai Duj	13.11.15	Friday
18. Guru Nanak Dev ji's Birthday	25.11.15	Wednesday
19. Christmas Day	25.12.15	Friday
20. Makar Sankranti	14.01.16	Wednesday
21. Republic Day	26.01.16	Monday
22. Maha Shivratri	07.03.16	Monday
23. Holi	24.03.16	Thursday

### Note:

1. Summer Break: 17th May 2015 to 30th June 2015
2. Autumn Break: 18th October 2015 to 23rd October 2015
3. Winter Break: 1st January 2016 to 10th January 2016

### Total Number of Working Days: 236

April: 23	Aug.: 21	Dec.: 25
May: 23	Sept.: 23	Jan.: 14
June: 06	Oct.: 18	Feb: 24
July: 24	Nov.: 19	Mar.: 16

## School Curriculum Goals

The Curriculum will adopt the following goals:

- to create a connect between learners' spiritual, ethical, social, cognitive, mental and physical growth and development;
- to nurture individuality and thus enhance one's innate potentials;
- to foster constitutional literacy and tolerance for different cultures;
- to develop scientific outlook and transformative competences, in order to meet the demands of changing society. The aim of education is not just to let learners obtain basic knowledge but to make them life-long learners. It is to nurture future citizens who are mentally and physically robust, assertive, confident, empathetic and helpful to the community, intellectually inquisitive and reflective, tolerant and with creative vision and global perspective. Schools will accomplish such standards through the promotion of values based learning activities which emphasize humanity, practicality, individuality, inclusiveness, and modernity. Such activities involve collaborations between oneself and others, individuals and the community, as well as humans and nature.

To achieve this, we must guide our learners to achieve the following curriculum goals:

- To enhance self-awareness and explore innate potential;
- To develop creativity and the ability to appreciate art and showcase one's own talents;
- To promote capabilities related to goal setting, decision making and lifelong learning;
- To nurture assertive communication and interpersonal skills;
- To learn to be empathetic towards others, display dignity and respect to the opposite gender, to contribute for the community, and focus on preserving environment;
- To foster cultural learning and international understanding in an interdependent society;
- To strengthen knowledge and attitude related to livelihood skills;
- To acquire the ability to utilize technology and information for the betterment of humankind;
- To inspire the attitude of functional and participatory learning; and
- To develop abilities related to thinking skills and problem solving.

### **Main Pedagogical Outcomes for Curriculum Learning Areas:**

- Learners use language to comprehend, acquire and communicate ideas and information and to interact with others.
- Learners identify, integrate and apply numerical and spatial concepts and techniques. They have clarity of concepts and are able to connect them to the real world.
- Learners understand and appreciate the physical, biological and technological world and have the knowledge, attitude, skills & values to make rational decisions in relation to it.
- Learners understand their cultural, geographical and historical milieus & have the knowledge, attitude, skills & values necessary to bring about transformation for a better India.

- Learners recognize the requirement of information, locate and resource it from a range of data available and evaluate, use and collaborate it with others.
- Learners identify, select, use technologies and are able to synthesize, innovate and discover newer technologies as required.
- Learners rationalize and reason about pre-defined arrangements, norms and relationships in order to comprehend, decode, validate and develop more relevant patterns.
- Learners think laterally, critically, identify opportunity, challenge their potential and are open to challenges. They are aware of consequences and take ownership of their deeds.
- Learners interact harmoniously with people and cultures from across the globe and are tolerant and empathetic towards others.
- Learners involve themselves in cultural pursuits as well as appreciate, respect and acknowledge the artistic, cultural and intellectual work of others.
- Learners value and engage in practices that promote personal physical as well as mental and cognitive development and well-being.

## EXAMINATION SCHEDULE

### AUGUST EXAMINATION SCHEDULE

Date	Subject
03.08.2015	Computer Science/ Physical Education Practical
04.08.2015	Biology Practical
05.08.2015	Chemistry Practical
06.08.2015	Physics Practical
07.08.2015	General Studies
10.08.2015	Chemistry
12.08.2015	Physics
14.08.2015	Computer Science/ physical Education
18.08.2015	English
20.08.2015	Maths/ Biology

### DECEMBER EXAMINATION SCHEDULE

Date	Subject
07.12.2015	Chemistry
09.12.2015	Physics
11.12.2015	Computer Science/ Physical Education
14.12.2015	English
16.12.2015	Maths/Biology
18.12.2015	Biology Practical
19.12.2015	Computer Science/Physical Education Practical
21.12.2015	General Studies
22.12.2015	Physics Practical
24.12.2015	Chemistry Practical

### ANNUAL EXAMINATION SCHEDULE

Date	Subject
18.02.2016	Computer Science/ Physical Education Practical
19.02.2016	Biology Practical
20.02.2016	Chemistry Practical
22.02.2016	Physics Practical
21.02.2016	General Studies
26.02.2016	Chemistry
29.02.2016	Physics
02.03.2016	Computer Science/ Physical Education
04.03.2016	English
07.03.2016	Maths/Biology

### OBJECTIVES

#### The general objectives at this stage are:

- To listen and comprehend live as well as record in writing oral presentations on a variety of topics.
- To develop greater confidence and proficiency in the use of language skills necessary for social and academic purpose.
- To participate in group discussions, interviews by making short oral presentation on given topics.
- To perceive the overall meaning and organisation of the text (i.e., the relationships of the different “chunks” in the text to each other.
- To identify the central/main point and supporting details, etc., to build communicative competence in various registers of English.
- To promote advanced language skills with an aim to develop the skills of reasoning, drawing inferences, etc. through meaningful activities.
- To translate texts from mother tongue(s) into English and vice versa.
- To develop ability and knowledge required in order to engage in independent reflection and enquiry.

At the end of this stage learners will be able to do the following:

- Read and comprehend extended texts (prescribed and non-prescribed) in the following genres: science fiction, drama, poetry, biography, autobiography, travel and sports literature, etc.
- text-based writing (i.e., writing in response to questions or tasks based on prescribed or unseen texts).
- Understand and respond to lectures, speeches, etc.
- Write expository / argumentative essays, explaining or developing a topic, arguing a case, etc.
- write formal/informal letters and applications for different purposes.
- Write items related to the workplace (minutes, memoranda, notices, summaries, reports etc. filling up of forms, preparing CV, e mail messages., making notes from reference materials, recorded talks etc. The core course should draw upon the language items suggested for class IX-X and delve deeper into their usage and functions. Particular attention may, however, be given to the following areas of grammar: The use of passive forms in scientific and innovative writings. Converting one kind of sentence/clause into a different kind of structure as well as other items to exemplify stylistic variations in different discourses modal auxiliaries-uses based on semantic considerations.

## **Specific Objectives of Reading:**

Students are expected to develop the following study skills:

- a. refer to dictionaries, encyclopaedia, thesaurus and academic reference material
- b. select and extract relevant information, using reading skills of skimming and scanning
- c. understand the writer's attitude and bias
- d. comprehend the difference between what is said and what is implied
- e. understand the language of propaganda and persuasion
- f. differentiate between claims and realities, facts and opinions
- g. form business opinions on the basis of latest trends available
- h. comprehend technical language as required in computer related fields
- i. arrive at personal conclusion and comment on a given text specifically
- j. develop the ability to be original and creative in interpreting opinion
- k. develop the ability to be logically persuasive in defending one's opinion
- l. making notes based on a text Develop literary skills as enumerated below:
  - personally respond to literary texts
  - appreciate and analyze special features of languages that differentiate literary texts from non-literary ones
  - explore and evaluate features of character, plot, setting, etc
  - understand and appreciate the oral, mobile and visual elements of drama
  - identify the elements of style such as humour, pathos, satire and irony, etc.
  - make notes from various resources for the purpose of developing the extracted ideas into sustained pieces of writing

## **Specific Objectives of Writing**

- to write letters to friends, pen friends, relatives, etc.
- to write business and official letters.
- to send faxes, e-mails[formal].
- to open accounts in post offices and banks.
- to fill in railway/airline reservation forms.
- to write on various issues to institutions seeking relevant information, lodge complaints, express thanks or tender apology.
- to write applications, fill in application forms, prepare a personal bio-data for admission into colleges, universities, entrance tests and jobs.
- to write informal reports as part of personal letters on functions, programmes and activities held in school (morning assembly, annual day, sports day, etc.)
- to write formal reports for school magazines/ events/processes/ or in local newspapers about events or occasions.
- to express opinions, facts, arguments in the form a speech or debates.
- to draft papers to be presented in symposia.
- to take down notes from talks and lectures.
- to write examination answers according to the requirement of various subjects.
- to summarise a text.



## ENGLISH CORE

### SECTION-A

#### Reading Comprehension

- **Very short answer and MCQ type questions:**

Two unseen passages (including poems) with a variety of questions including 04 marks for vocabulary such as word formation and inferring meaning. The total range of the 2 passages including a poem or a stanza, should be around 900-1000 words.

1. 550-600 words in length (for note-making and summarising)
2. 350-400 words in length (to test comprehension, interpretation and inference)

An unseen poem of about 28-35 lines.

The passages could be of any one of the following types:

- Factual passages e.g. illustrations, description, reports
- Discursive passages involving opinion, e.g. argumentative, persuasive
- Literary passages e.g. extracts from fiction, biography, autobiography, travelogue, etc.

In the case of a poem, the text may be shorter than the prescribed word limit.

### SECTION B

#### Writing Skills and Grammar

##### WRITING

- **Short Answer Questions:** Based on notice/poster/advertisement
- **Long Answer Questions:** Letters based on verbal / visual input. It would cover all types of letters.
- **Letter types may include:**
  - a) Business or official letters (for making enquiries, registering complaints, asking for and giving information, placing orders and sending replies)
  - b) Letters to the editor (giving suggestions on an issue)
  - c) Application for a job with a bio-data or resume
  - d) Letter to the school or college authorities, regarding admissions, school issues, requirements/suitability of courses, etc.
- **Very Long Answer Question:** Composition in the form of article, speech, report writing or a narrative.

##### Grammar

- Different grammatical structures in meaningful contexts will be tested. Item types will include gap filling, sentence re-ordering, dialogue completion and sentence transformation. The grammar syllabus will include determiners, tenses, clauses, modals and change of Voice. These grammar areas will be tested using the following short answer type and MCQ type questions:
- Error Correction, editing tasks,
- Re-ordering of sentences,
- Transformation of sentences

## SECTION C

### Literature and Long Reading Texts

Questions to test comprehension at different levels : literals, inferential and evaluative

1. **Hornbill** : Textbook published by NCERT, New Delhi
2. **Snapshots**: Supplementary Reader published by NCERT, New Delhi

The following have been deleted:

#### Textbooks

Hornbill

#### Name of the lessons deleted

1. Landscape of the soul
2. The Adventure
3. Silk Road
4. The Laburnum Top(Poetry)
5. The Ghat of the only World

Snapshots

- **Very Short Answer Questions**-Based on an extract from poetry to test reference to context comprehension and appreciation.
- **Short Answer Questions**-Based on prose, poetry and plays from both the texts.
- **Long Answer Question**-Based on prescribed texts to test global comprehension and extrapolation beyond the texts to bring out the key messages and values.  
**Long Answer Questions**-Based on theme, plot, incidents or event from the prescribed novels.
- **Long Answer Questions**-Based on understanding appreciation, analysis and interpretation of the characters.

**Note:** Values –based questions may be given as long answer in the writing or literature sections.

### Long Reading Texts (Anyone)

With a view to inculcate the habit of reading among the students, CBSE has introduced compulsory reading of a Long Reading Text -Novel in the English Core Course and will be evaluated in the Term end Assessments. Schools can opt for either one of the texts.

#### NOVEL

The Canterville Ghost

Up from Slavery

#### AUTHOR

Oscar Wilde (Unabridged 1906 Edition)

Booker T. Washington (unabridged 2000 Edition)

## QUESTION PAPER DESIGN

### CLASS-XI

### ENGLISH CORE

### CODE-301

Typology	Typology of questions/learning outcomes	MCQ 1 mark	VSAQ 1 mark	Short answer Question 3 marks	Short answer Question 4 marks	Long Answer-I 80-100 words 5 marks	Long Answer-2 Question 120-150 words 6 marks	Very long answer 150-200 words (HOTS) 10 marks	Total Marks	Over all %
<b>Reading Skills</b>	Conceptual understanding, decoding, analyzing, inferring, interpreting appreciating. Literary conventions and vocabulary, summarising and using appropriate format/s	<b>6</b>	<b>6</b>	<b>1</b>	---	<b>1</b>	---	---	<b>20</b>	<b>20</b>
<b>Writing Skills and Grammar</b>	Reasoning, appropriacy of style and tone, using appropriate format and fluency inference, analysis, evaluation and creativity, appreciation applying of language conventions, comprehension using structures with accuracy and fluency.	--	<b>10</b>	---	<b>01</b>	---	<b>01</b>	<b>1</b>	<b>30</b>	<b>30</b>
<b>Literary Textbooks And long reading text</b>	Recalling, reasoning , appreciating a literary conventions, inference, analysis, evaluation, creativity with fluency	<b>3</b>	---	<b>3</b>	---	---	<b>3</b>	---	<b>30</b>	<b>30</b>
<b>Assessment of speaking and Listening Skills</b>	Interaction , reasoning, diction, articulation, clarity, pronunciation and overall fluency		---		---	<b>10+10 (L + S)</b>			<b>20</b>	<b>20</b>
<b>TOTAL</b>		<b>9x1=9</b>	<b>16x1=16</b>	<b>4x3=12</b>	<b>1x4=4</b>	<b>1x5=5</b>	<b>4x6=24</b>	<b>1x10=10</b>	<b>80</b>	<b>100</b>

## ANNUAL SYLLABUS BREAK UP

### APRIL

<b>S.No</b>	<b>Name of the Books</b>	<b>Chapters</b>
1	HornBill	CH.1: The Portrait of a Lady
2	The Snapshots	CH.1: The Summer of the beautiful white horse
3	Writing Skills	Report (for News Paper & School Magazines)
4	Grammar	Tenses
5	Novel (Canterville Ghost)	Introduction & Discussion of Chapter1
6	Reading Skills	Unseen Passage

### MAY

<b>S. No.</b>	<b>Name of the Books</b>	<b>Chapters</b>
1	HornBill	Poem 1: A Photograph
2	The Snapshots	CH.2: Address
3	Writing Skills	Letters (Formal)
4	Grammar	Determiners
5	Novel (Canterville Ghost)	Discussion of Chapter II
6	Reading Skills	Unseen Passage

### JUNE

<b>S.No</b>	<b>Name of the Books</b>	<b>Chapters</b>
1	HornBill	CH.2: We're not afraid to die: if we can all be together Poem 2: The Voice of the Rain
2	Reading Skills	Note Making

### JULY

<b>S. No.</b>	<b>Name of the Books</b>	<b>Chapters</b>
1	Hornbill	CH.3: Discovering Tut : The Saga Continues
2	The Snapshots	CH.3: Ranga's Marriage Poem 3: Childhood
4	Writing Skills	Article, Notice, Advertisement
5	Grammar	Active & Passive Voice
6	Novel	Discussion of Chapter III

### AUGUST

REVISION FOR AUGUST EXAMINATION

## SEPTEMBER

<b>S.No.</b>	<b>Name of the Books</b>	<b>Chapters</b>
1	The Snapshots	CH.4: Albert Einstein at School
2	Hornbill	Poem 4: Childhood
3	Writing Skills	Speech
4	Grammar	Clauses
5	Novel	Discussion of Chapter IV

## OCTOBER

<b>S.No.</b>	<b>Name of the Books</b>	<b>Chapters</b>
1	HornBill	CH.5: The Ailing Planet: The Green Movement's Role. Poem 5: Father to Son
2	The Snapshots	CH.5: Mother's Day
4	Writing Skills	Debate
5	Grammar	Models
6	Novel	Discussion of Chapter V and VI

## NOVEMBER

<b>S.NO.</b>	<b>Name of the Books</b>	<b>Chapters</b>
1	HornBill	CH.6: The Browning Version
2	Grammar	Editing , Gap Filling
3	Novel	Discussion of Chapter VII
4	The Snapshots	CH.7: Birth & CH.8: The Tale of melon City
5	Grammar	1.Omitting 2. Sentence Transformation

## DECEMBER

REVISION FOR DECEMBER EXAMINATION

## **EXAMINATION SYLLABUS**

### **AUGUST EXAMINATION**

#### **Hornbill:**

The Portrait of a Lady

A Photograph

We're not afraid to die: if we can all be together

Discovering Tut: The Saga Continues

#### **Snapshots:**

The Summer of the beautiful white horse

Address

Ranga's Marriage

#### **Poetry:**

The Voice of the Rain

Childhood

#### **Novel:**

Canterville Ghost (Chapter 1, 2 and 3).

#### **Writing Skills:**

Report (for News Paper & School Magazines)

Letters (Formal)

Article, Notice, Advertisement

#### **Grammar:**

Tenses

Determiners

Active & Passive Voice

#### **Reading Skills:**

Unseen Passage

Note Making

### **DECEMBER EXAMINATION**

FULL SYLLABUS

### **FEBRUARY EXAMINATION**

FULL SYLLABUS

**NOTE:** There will be a class test and assignment after every chapter.

## DETAILED SYLLABUS OF MATHEMATICS

### OBJECTIVES

The broad objectives of teaching Mathematics at senior school stage intend to help the students:

- to acquire knowledge and critical understanding, particularly by way of motivation and visualization, of basic concepts, terms, principles, symbols and mastery of underlying processes and skills.
- to feel the flow of reasons while proving a result or solving a problem.
- to apply the knowledge and skills acquired to solve problems and wherever possible, by more than one method.
- to develop positive attitude to think, analyze and articulate logically.
- to develop interest in the subject by participating in related competitions.
- to acquaint students with different aspects of Mathematics used in daily life.
- to develop an interest in students to study Mathematics as a discipline.
- to develop awareness of the need for national integration, protection of environment, observance of small family norms, removal of social barriers, elimination of gender biases.
- to develop reverence and respect towards great Mathematicians for their contributions to the field of Mathematics.

### COURSE STRUCTURE

One Paper

Three Hours

Max.Marks:100

Units		Marks
I.	Sets and Functions	29
II.	Algebra	37
III.	Coordinate Geometry	13
IV.	Calculus	06
V.	Mathematical Reasoning	03
VI.	Statistics and Probability	12
	Total	100

## QUESTION PAPER DESIGN

S.No	Typology of questions	Learning Outcomes and Testing Competencies	Very Short Answer (1 mark)	Long Answer I (4 Marks)	Long Answer II (6 marks)	Marks	% Weightage
1	<b>Remembering- (Knowledge based</b> simple recall questions, to know specific facts, terms, concepts, principles, or theories, Identify, define, or recite, information)	<ul style="list-style-type: none"> <li>• Reasoning</li> <li>• Analytical Skills</li> <li>• Critical thinking</li> <li>• Derivative</li> </ul>	2	3	1	20	20%
2	<b>Understanding- (Comprehension</b> – to be familiar with meaning and to understand conceptually, interpret, compare, contrast, explain, paraphrase information)		2	2	1	16	16%
3	<b>Application</b> (Use abstract information in concrete situation, to apply knowledge to new situations, Use given content to interpret a situation, provide an example, or solve a problem)		1	3	2	25	25%
4	<b>High Order Thinking skills</b> (Analysis & Synthesis- Classify , compare, contrast or differentiate between different pieces of information, Organize and /or integrate unique pieces of information from a variety of sources)		1	2	2	21	21%
5	<b>Evaluation and Multi-Disciplinary-</b> (Appraise, judge, and / or justify the value or worth of a decision or outcome, or to predict outcomes based on values)		--	2+1 (Values based)	1	18	18%
	<b>TOTAL</b>		6x1=6	13x4=52	7x6=42	100	100%



## ANNUAL SYLLABUS BREAK UP

### APRIL

#### Chapter 1: Sets

Sets and their representations. Empty set. Finite and Infinite sets. Equal sets. Subsets. Subsets of a set of real numbers especially intervals (with notations). Power set. Universal set. Venn diagrams. Union and Intersection of sets. Difference of sets. Complement of a set. Properties of Complement Sets. Practical Problems based on sets.

#### Chapter 2: Relations and Functions

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  $\mathbb{R} \times \mathbb{R}$ ). Definition of relation, pictorial diagrams, domain, co-domain and range of a relation. Function as a special kind of relation from one set to another. Pictorial representation of a function, domain, co-domain and range of a function. Real valued functions, domain and range of these functions: constant, identity, polynomial, rational, modulus, signum and greatest integer functions, with their graphs. Sum, difference, product and quotients of functions.

#### Chapter 12: Introduction to 3D Geometry

Coordinate axes and coordinate planes in three dimensions. Coordinates of a point in space. Distance between two points and section formula.

### MAY

#### Chapter 3: Trigonometric Functions

Positive and negative angles. Measuring angles in radians and in degrees and conversion of one into other. Definition of trigonometric functions with the help of unit circle. Truth of the  $\sin^2x + \cos^2x=1$ , for all  $x$ . Signs of trigonometric functions. Domain and range of trigonometric functions and their graphs. Expressing  $\sin(x \pm y)$  and  $\cos(x \pm y)$  in terms of  $\sin x$ ,  $\sin y$ ,  $\cos x$  &  $\cos y$  and their simple application. Deducing identities like the following:

$$\tan(x \pm y) = \frac{\tan x \pm \tan y}{1 \mp \tan x \tan y}, \cot(x \pm y) = \frac{\cot x \cot y \mp 1}{\cot y \pm \cot x}$$

$$\sin x + \sin y = 2 \sin \frac{x+y}{2} \cos \frac{x-y}{2}, \cos x + \cos y = 2 \cos \frac{x+y}{2} \cos \frac{x-y}{2},$$

$$\sin x - \sin y = 2 \cos \frac{x+y}{2} \sin \frac{x-y}{2}, \cos x - \cos y = -2 \sin \frac{x+y}{2} \sin \frac{x-y}{2}.$$

Identities related to  $\sin 2x$ ,  $\cos 2x$ ,  $\tan 2x$ ,  $\sin 3x$ ,  $\cos 3x$  and  $\tan 3x$ . General solution of trigonometric equations of the type  $\sin q = \sin a$ ,  $\cos y = \cos a$  and  $\tan q = \tan a$ . Proof applications of sine and cosine formulae.

#### **Chapter 4: Mathematical Induction**

Process of the proof by induction, motivating the application of the method by looking at natural numbers as the least inductive subset of real numbers. The principle of mathematical induction and simple applications.

### **JUNE**

#### **Chapter 16: Probability**

Random experiments; outcomes, sample spaces (set representation). 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. Probability of an event, probability of 'not', 'and' and 'or' events.

### **JULY**

#### **Chapter 5: Complex Numbers and quadratic Equations**

Need for complex numbers, especially  $\sqrt{-1}$ , to be motivated by inability to solve some of the quadratic equations. Algebraic properties of complex numbers. Argand plane and polar representation of complex numbers. Statement of Fundamental Theorem of Algebra, solution of quadratic equations in the complex number system. Square root of a complex number.

#### **Chapter 6: Linear Inequalities**

Linear inequalities. Algebraic solutions of linear inequalities in one variable and their representation on the number line. Graphical solution of linear inequalities in two variables. Graphical solution of system of linear inequalities in two variables.

## Chapter 7: Permutation and combination

Fundamental principle of counting. Factorial  $n$ . ( $n!$ ) Permutations and combinations, derivation of formulae and their connections, simple applications.

### AUGUST

REVISION FOR AUGUST EXAMINATION

### SEPTEMBER

## Chapter 8: Binomial Theorem

History, statement and proof of the binomial theorem for positive integral indices.

Pascal's triangle, General and middle term in binomial expansion, simple applications

## Chapter 9: Sequences and Series

Sequence and Series. Arithmetic Progression (A.P.). Arithmetic Mean (A.M.) Geometric Progression (G.P.), general term of a G.P., sum of  $n$  terms of a G.P., Arithmetic and Geometric series infinite G.P. and its sum, geometric mean (G.M.), relation between A.M. and G.M. Sum to  $n$  terms of the special series.

$$\sum_{k=1}^n k, \sum_{k=1}^n k^2 \text{ and } \sum_{k=1}^n k^3$$

### OCTOBER

## Chapter 10: Straight Lines

Brief recall of two dimensional geometry from earlier classes. Shifting of origin. Slope of a line and angle between two lines. Various forms of equations of a line: parallel to axis, point-slope form, slope-intercept form, two-point form, intercept form and normal form. General equation of a line. Equation of family of lines passing through the point of intersection of two lines. Distance of a point from a line.

## Chapter 14: Mathematical Reasoning

Mathematically acceptable statements. Connecting words/ phrases - consolidating the understanding of "if and only if (necessary and sufficient) condition", "implies", "and/or", "implied by", "and", "or", "there exists" and their use through variety of examples related to real

life and Mathematics. Validating the statements involving the connecting words difference between contradiction, converse and contrapositive.

## **NOVEMBER**

### **Chapter 11: Conic Sections**

Sections of a cone: circles, ellipse, parabola, hyperbola; a point, a straight line and a pair of intersecting lines as a degenerated case of a conic section. Standard equations and simple properties of parabola, ellipse and hyperbola. Standard equation of a circle.

### **Chapter 13: Limits and Derivatives**

Derivative introduced as rate of change both as that of distance function and geometrically. Intuitive idea of limit. Limits of polynomials and rational functions, trigonometric, exponential and logarithmic functions. Definition of derivative, relate it to slope of tangent of a curve, derivative of sum, difference, product and quotient of functions. The derivative of polynomial and trigonometric functions.

## **DECEMBER**

### **REVISION FOR DECEMBER EXAMINATION**

## **JANUARY**

### **Chapter 15: Statistics**

Measures of dispersion; mean deviation, variance and standard deviation of ungrouped/grouped data. Analysis of frequency distributions with equal means but different variances.

### **Revision**

## **EXAMINATION SYLLABUS**

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### **AUGUST EXAMINATION**

Chapter (1to7), 12 and 16.

### **DECEMBER EXAMINATION**

Chapter (1 to 14) and chapter 16.

### **FEBRUARY EXAMINATION**

Full Syllabus

**NOTE:** There will be a class test and assignment after every chapter.

## DETAILED SYLLABUS OF PHYSICS

### OBJECTIVES

Senior Secondary stage of school education is a stage of transition from general education to discipline-based focus on curriculum. The present updated syllabus keeps in view the rigour and depth of disciplinary approach as well as the comprehension level of learners. Due care has also been taken that the syllabus is comparable to the international standards. Salient features of the syllabus include:

- Emphasis on basic conceptual understanding of the content.
- Emphasis on use of SI units, symbols, nomenclature of physical quantities and formulations as per international standards.
- Providing logical sequencing of units of the subject matter and proper placement of concepts with their linkage for better learning.
- Reducing the curriculum load by eliminating overlapping of concepts/content within the discipline and other disciplines.
- Promotion of process-skills, problem-solving abilities and applications of Physics concepts.

**Besides, the syllabus also attempts to**

- Strengthen the concepts developed at the secondary stage to provide firm foundation for further learning in the subject.
- Expose the learners to different processes used in Physics-related industrial and technological applications.
- Develop process-skills and experimental, observational, manipulative, decision making and investigatory skills in the learners.
- Promote problem solving abilities and creative thinking in learners.
- Develop conceptual competence in the learners and make them realize and appreciate the interface of Physics with other disciplines.

### PHYSICS (CODE 042) COURSE STRUCTURE

**Time: 3 hrs.**

**Max Marks: 70**

UNITS	No. of Periods	Marks
Unit I Physical World and Measurement	10	23
Unit II Kinematics	24	
Unit III Laws of Motion	14	
Unit IV Work, Energy and Power	12	17
Unit V Motion of System of Particles and Rigid Body	18	
Unit VI Gravitation	12	
Unit VII Properties of Bulk Matter	24	20
Unit VIII Thermodynamics	12	
Unit IX Behaviour of Perfect Gases and Kinetic Theory of gases	08	
Unit X Oscillations and Waves	26	10
<b>Total</b>	<b>160</b>	<b>70</b>

## PRACTICALS

The record, to be submitted by the students, at the time of their annual examination, has to include:

- Record of at least 15 Experiments [with a minimum of 8 from section A and 7 from section B], to be performed by the students.
- Record of at least 5 Activities [with a minimum of 2 each from section A and section B], to be performed by the students.
- Report of the project to be carried out by the students.

## EVALUATION SCHEME

Two experiments one from each section	8+8 marks
Practical record(experiment and activities)	6 marks
Investigatory Project	3 marks
Viva on experiments , activities and project	5 marks
<b>Total</b>	<b>30 Marks</b>

## QUESTION PAPER DESIGN

Time 3 Hours

Max. Marks: 70

S.No.	Typology of questions	Very Short Answer (VSA) 1 mark	Short Answer-I (SA-I) 2 marks	Short Answer-II (SA-II) 3 marks	Value Based Questions 4 marks	Long Answer (5 marks)	Total marks	% Weightage
1	<b>Remembering - (Knowledge based</b> simple recall questions, to know specific facts, terms, concepts, principles, or theories, Identify, define, or recite, information)	2	1	1	-	-	7	10%
2	<b>Understanding- (Comprehension -</b> to be familiar with meaning and to understand conceptually, interpret, compare, contrast, explain, paraphrase information)	-	2	4	-	1	21	30%
3	<b>Application</b> (Use abstract information in concrete situation, to apply knowledge to new situations, Use given content to interpret a situation, provide an example, or solve a problem)	-	2	4	-	1	21	30%
4	<b>High Order Thinking skills (Analysis &amp; Synthesis-</b> Classify, compare, contrast or differentiate between different pieces of information, Organize and /or integrate unique pieces of information from a variety of sources)	2	-	1	-	1	10	14%
5	<b>Evaluation and Multi-Disciplinary-</b> (Appraise, judge, and / or justify the value or worth of a decision or outcome, or to predict outcomes based on value	1	-	2	1	-	11	16%
	<b>TOTAL</b>	<b>5x1=5</b>	<b>5x2=10</b>	<b>12x3=36</b>	<b>1x4=4</b>	<b>3x5=15</b>	<b>70(26)</b>	<b>100%</b>



## ANNUAL SYLLABUS BREAK UP

### APRIL

#### Unit I: Physical World and Measurement

10 Periods

Physics - scope and excitement; nature of physical laws; Physics, technology and society. Need for measurement: Units of measurement; systems of units; SI units, fundamental and derived units. Length, mass and time measurements; accuracy and precision of measuring instruments; errors in measurement; significant figures. Dimensions of physical quantities, dimensional analysis and its applications.

### APRIL -MAY

#### Unit II: Kinematics

24 Periods

Frame of reference, Motion in a straight line: Position-time graph, speed and velocity. Elementary concepts of differentiation and integration for describing motion. Uniform and non-uniform motion, average speed and instantaneous velocity. Uniformly accelerated motion, velocity time and position-time graphs. Relations for uniformly accelerated motion (graphical treatment). Scalar and vector quantities; Position and displacement vectors, general vectors and their notations; equality of vectors, multiplication of vectors by a real number; addition and subtraction of vectors. Relative velocity. Unit vector; Resolution of a vector in a plane - rectangular components. Scalar and Vector product of vectors. Motion in a plane. Cases of uniform velocity and uniform acceleration-projectile motion. Uniform circular motion.

### JUNE

#### Unit III: Laws of Motion

14 Periods

Intuitive concept of force. Inertia, Newton's first law of motion; momentum and Newton's second law of motion; impulse; Newton's third law of motion. Law of conservation of linear momentum and its applications. Equilibrium of concurrent forces. Static and kinetic friction, laws of friction, rolling friction, lubrication. Dynamics of uniform circular motion: Centripetal force, examples of circular motion (vehicle on a level circular road, vehicle on banked road).

### JULY

#### Unit IV: Work, Energy and Power

12 Periods

Work done by a constant force and a variable force; kinetic energy, work-energy theorem, power. Notion of potential energy, potential energy of a spring, conservative forces: conservation of mechanical energy (kinetic and potential energies); non-conservative forces: motion in a vertical circle; elastic and inelastic collisions in one and two dimensions.

#### Unit V: Motion of System of Particles and Rigid Body

18 Periods

Centre of mass of a two-particle system, momentum conservation and centre of mass motion. Centre of mass of a rigid body; centre of mass of a uniform rod. Moment of a force, torque, angular momentum, laws of conservation of angular momentum and its applications. Equilibrium of rigid bodies, rigid body rotation and equations of rotational motion, comparison of linear and rotational motions. Moment of inertia, radius of gyration. Values of moments of inertia, for simple geometrical objects (no derivation). Statement of parallel and perpendicular axes theorems and their applications.

### AUGUST

REVISION FOR AUGUST EXAMINATION

## SEPTEMBER

### Unit VI: Gravitation

12 Periods

Keplar's laws of planetary motion. The universal law of gravitation. Acceleration due to gravity and its variation with altitude and depth.

Gravitational potential energy and gravitational potential. Escape velocity. Orbital velocity of a satellite. Geo-stationary satellites.

## SEPTEMBER- OCTOBER

### Unit VII: Properties of Bulk Matter

24 Periods

Elastic behaviour, Stress-strain relationship, Hooke's law, Young's modulus, bulk modulus, shear modulus of rigidity, Poisson's ratio; elastic energy. Pressure due to a fluid column; Pascal's law and its applications (hydraulic lift and hydraulic brakes). Effect of gravity on fluid pressure.

Viscosity, Stokes' law, terminal velocity, streamline and turbulent flow, critical velocity. Bernoulli's theorem and its applications. Surface energy and surface tension, angle of contact, excess of pressure across a curved surface, application of surface tension ideas to drops, bubbles and capillary rise.

Heat, temperature, thermal expansion; thermal expansion of solids, liquids and gases, anomalous expansion of water; specific heat capacity;  $C_p$ ,  $C_v$  - calorimetry; change of state - latent heat capacity.

Heat transfer-conduction, convection and radiation, thermal conductivity, Qualitative ideas of Blackbody radiation, Wein's displacement Law, Stefan's law, Greenhouse effect.

## NOVEMBER

### Unit VIII: Thermodynamics

12 Periods

Thermal equilibrium and definition of temperature (zeroth law of thermodynamics). Heat, work and internal energy. First law of thermodynamics. Isothermal and adiabatic processes.

Second law of thermodynamics: reversible and irreversible processes. Heat engine and refrigerator.

### Unit IX: Behaviour of Perfect Gases and Kinetic Theory of Gases

08 Periods

Equation of state of a perfect gas, work done in compressing a gas.

Kinetic theory of gases - assumptions, concept of pressure. Kinetic interpretation of temperature; rms speed of gas molecules; degrees of freedom, law of equi-partition of energy (statement only) and application to specific heat capacities of gases; concept of mean free path, Avogadro's number.

### Unit X: Oscillations and Waves

16 Periods

Periodic motion - time period, frequency, displacement as a function of time. Periodic functions.

Simple harmonic motion (S.H.M) and its equation; phase; oscillations of a spring-restoring force and force constant; energy in S.H.M. Kinetic and potential energies; simple pendulum derivation of expression for its time period. Free, forced and damped oscillations (qualitative ideas only), resonance. Wave motion. Transverse and longitudinal waves, speed of wave motion. Displacement

relation for a progressive wave. Principle of superposition of waves, reflection of waves, standing waves in strings and organ pipes, fundamental mode and harmonics, Beats, Doppler effect.

## DECEMBER

REVISION FOR DECEMBER EXAMINATION

## PRACTICALS

The record, to be submitted by the students, at the time of their annual examination, has to include:

1. Record of at least 15 Experiments [with a minimum of 8 from section A and 7 from section B], to be performed by the students.
2. Record of at least 5 Activities [with a minimum of 2 each from section A and section B], to be Performed by the students.
3. Report of the project to be carried out by the students.

### SECTION-A

(APRIL-JULY)

#### Experiments Total Periods: 60

(Any 8 experiments out of the following to be performed by the Students)

1. To measure diameter of a small spherical/cylindrical body and to measure internal diameter and depth of a given beaker/calorimeter using Vernier Callipers and hence find its volume.
2. To measure diameter of a given wire and thickness of a given sheet using screw gauge.
3. To determine volume of an irregular lamina using screw gauge.
4. To determine radius of curvature of a given spherical surface by a spherometer.
5. To determine the mass of two different objects using a beam balance.
6. To find the weight of a given body using parallelogram law of vectors.
7. Using a simple pendulum, plot L-T and L-T<sup>2</sup> graphs. Hence find the effective length of second's pendulum using appropriate graph.
8. To study variation of time period of a simple pendulum by changing its length and taking bobs of different masses independently and interpret the result.
9. To study the relationship between force of limiting friction and normal reaction and to find the co-efficient of friction between a block and a horizontal surface.
10. To find the downward force, along an inclined plane, acting on a roller due to Gravitational pull of the earth and study its relationship with the angle of inclination ( $\theta$ ) by plotting graph between force and  $\sin \theta$ .

#### Activities

1. To make a paper scale of given least count, e.g., 0.2cm, 0.5 cm.
2. To determine mass of a given body using a metre scale by principle of moments.
3. To plot a graph for a given set of data, with proper choice of scales and error bars.
4. To measure the force of limiting friction for rolling of a roller on a horizontal plane.
5. To study the variation in range of a Projectile with angle of projection.
6. To study the conservation of energy of a ball rolling down on an inclined plane (using a double inclined plane).
7. To study dissipation of energy of a simple pendulum by plotting a graph between square of amplitude and time.

## SECTION-B

(SEPTEMBER-DECEMBER)

### Experiments

(Any 7 experiments out of the following to be performed by the students)

1. To determine Young's modulus of elasticity of the material of a given wire.
2. To find the force constant of a helical spring by plotting a graph between load and extension.
3. To study the variation in volume with pressure for a sample of air at constant temperature by plotting graphs between  $P$  and  $V$ , and between  $P$  and  $1/v$ .
4. To determine the surface tension of water by capillary rise method.
5. To determine the coefficient of viscosity of a given viscous liquid by measuring terminal velocity of a given spherical body.
6. To study the relationship between the temperature of a hot body and time by plotting a cooling curve.
7. To determine specific heat capacity of a given (i) solid, (ii) liquid, by method of mixtures.
8. To study the relation between frequency and length of a given wire under constant tension using sonometer.

OR

To study the relation between the length of a given wire and tension for constant frequency using sonometer.

9. To find the speed of sound in air at room temperature using a resonance tube by two resonance positions.

### Activities

1. To observe change of state and plot a cooling curve for molten wax.
2. To observe and explain the effect of heating on a bi-metallic strip.
3. To note the change in level of liquid in a container on heating and interpret the observations.
4. To study the effect of detergent on surface tension of water by observing capillary rise.
5. To study the factors affecting the rate of loss of heat of a liquid.
6. To study the effect of load on depression of a suitably clamped meter scale loaded at (i) its end (ii) in the middle.
7. To observe the decrease in pressure with increase in velocity of a fluid.

## **EXAMINATION SYLLABUS**

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### **AUGUST EXAMINATION**

Unit 1, 2, 3, 4 & 5.

### **DECEMBER EXAMINATION**

Unit (1 to 10).

### **FEBRUARY EXAMINATION**

Full Syllabus

**NOTE:** There will be a class test and assignment after every chapter.

## DETAILED SYLLABUS OF CHEMISTRY

### OBJECTIVES

- The broad objectives of teaching Chemistry at Senior Secondary Stage are:
- To promote understanding of basic facts and concepts in chemistry while retaining the excitement of chemistry.
- To make students capable of studying chemistry in academic and professional courses (such as medicine, engineering, technology) at tertiary level.
- To expose the students to various emerging new areas of chemistry and apprise them with their relevance in future studies and their application in various spheres of chemical sciences and technology.
- To equip students to face various challenges related to health, nutrition, environment, population, weather, industries and agriculture.
- To develop problem solving skills in students.
- To expose the students to different processes used in industries and their technological applications. to apprise students with interface of chemistry with other disciplines of science such as physics, biology, geology, engineering etc.
- To acquaint students with different aspects of chemistry used in daily life.
- To develop an interest in students to study chemistry as a discipline.

### COURSE STRUCTURE

Unit No.	Title	Marks
Unit I	Some Basic Concepts of chemistry	<b>11</b>
Unit II	Structure of Atom	
Unit III	Classification of Elements and Periodicity in Properties	<b>04</b>
Unit IV	Chemical Bonding and Molecular Structure	<b>21</b>
Unit V	States of Matter :Gases and Liquids	
Unit VI	Thermodynamics	
Unit VII	Equilibrium	
Unit VIII	Redox Reactions	<b>16</b>
Unit IX	Hydrogen	
Unit X	S-Block Elements	
Unit XI	Some p-Block Elements	
Unit XII	Organic Chemistry: Some basic Principles and Techniques	<b>18</b>
Unit XIII	Hydrocarbons	
Unit XIV	Environmental Chemistry	
	<b>Total</b>	<b>70</b>

## QUESTION PAPER DESIGN

S.No	Typology of questions	Very Short Answer (VSA) 1 mark	Short Answer -I (SA-I) 2 marks	Short Answer-II (SA-II) 3 marks	Value Based Questions 4 marks	Long Answer (L.A.) (5 Marks)	Total marks	% Weightage
1	<b>Remembering-</b> (Knowledge based simple recall questions, to know specific facts , terms, concepts, principles, or theories, Identify, define, or recite, information)	2	1	1	-	-	7	10%
2	<b>Understanding-</b> (Comprehension –to be familiar with meaning and to understand conceptually, interpret , compare, contrast, explain, paraphrase information)	-	2	4	-	1	21	30%
3	<b>Application</b> (Use abstract information in concrete situation , to apply knowledge to new situations , Use given content to interpret a situation , provide an example , or solve a problem)	-	2	4	-	1	21	30%
4	<b>High Order Thinking skills</b> (Analysis & Synthesis- Classify, compare, contrast or differentiate between different pieces of information, Organize and /or integrate unique pieces of information from a variety of sources	2	-	1	-	1	10	14%
5	<b>Evaluation and Multi-Disciplinary-</b> (Appraise , judge, and / or justify the value or worth of a decision or outcome , or to predict outcomes based on value	1	-	2	1	-	11	16%
<b>TOTAL</b>		5x1=5	5x2=10	12x3=36	1x4=4	3x5=15	70(26)	100%

## ANNUAL SYLLABUS BREAK UP

### APRIL

#### **Unit I: Some Basic Concepts of Chemistry**

**12 Periods**

General Introduction: Importance and scope of chemistry.

Nature of matter, laws of chemical combination, Dalton's atomic theory: concept of elements, atoms and molecules.

Atomic and molecular masses, mole concept and molar mass, percentage composition, empirical and molecular formula, chemical reactions, stoichiometry and calculations based on stoichiometry.

#### **Unit II: Structure of Atom**

**14 Periods**

Discovery of Electron, Proton and Neutron, atomic number, isotopes and isobars. Thomson's model and its limitations. Rutherford's model and its limitations, Bohr's model and its limitations, concept of shells and subshells, dual nature of matter and light, de Broglie's relationship, Heisenberg uncertainty principle, concept of orbitals, quantum numbers, shapes of s, p and d orbitals, rules for filling electrons in orbitals -Aufbau principle, Pauli's exclusion principle and Hund's rule, electronic configuration of atoms, stability of half-filled and completely filled orbitals.

#### **PRACTICAL:**

##### A. Basic Laboratory Techniques

1. Cutting glass tube and glass rod
2. Bending a glass tube
3. Drawing out a glass jet
4. Boring a cork

##### B. Characterization and Purification of Chemical Substances

1. Determination of melting point of an organic compound.
2. Determination of boiling point of an organic compound.
3. Crystallization of impure sample of any one of the following: Alum, Copper Sulphate, Benzoic Acid.

### MAY

#### **Unit III: Classification of Elements and Periodicity in Properties**

**08 Periods**

Significance of classification, brief history of the development of periodic table, modern periodic law and the present form of periodic table, periodic trends in properties of elements -atomic radii, ionic radii, inert gas radii Ionization enthalpy, electron gain enthalpy, electronegativity, valency. Nomenclature of elements with atomic number greater than 100.

#### **Unit IV: Chemical Bonding and Molecular structure**

**14 Periods**

Valence electrons, ionic bond, covalent bond; bond parameters, Lewis structure, polar character of covalent bond, covalent character of ionic bond, valence bond theory, resonance, geometry of covalent molecules, VSEPR theory, concept of hybridization, involving s, p and d orbitals and shapes of some simple molecules, molecular orbital theory of homonuclear diatomic molecules(qualitative idea only), hydrogen bond.



**PRACTICAL:**

E. Quantitative Estimation

- i) Using a chemical balance.
- ii) Preparation of standard solution of Oxalic acid.
- iii) Determination of strength of a given solution of Sodium Hydroxide by titrating it against standard solution of Oxalic acid.
- iv) Preparation of standard solution of Sodium Carbonate.
- v) Determination of strength of a given solution of Hydrochloric acid by titrating it against standard Sodium Carbonate solution.

**JUNE****Unit XIV: Environmental Chemistry****06 Periods**

Environmental pollution - air, water and soil pollution, chemical reactions in atmosphere, smog, major atmospheric pollutants, acid rain, ozone and its reactions, effects of depletion of ozone layer, greenhouse effect and global warming- pollution due to industrial wastes, green chemistry as an alternative tool for reducing pollution, strategies for control of environmental pollution.

**JULY****Unit V: States of Matter: Gases and Liquids****12 Periods**

Three states of matter, intermolecular interactions, types of bonding, melting and boiling points, role of gas laws in elucidating the concept of the molecule, Boyle's law, Charles law, Gay Lussac's law, Avogadro's law, ideal behaviour, empirical derivation of gas equation, Avogadro's number, ideal gas equation.

Deviation from ideal behaviour, liquefaction of gases, critical temperature, kinetic energy and molecular speeds (elementary idea), Liquid State- vapour pressure, viscosity and surface tension (qualitative idea only, no mathematical derivations).

**Unit VI: Chemical Thermodynamics****16 Periods**

Concepts of System and types of systems, surroundings, work, heat, energy, extensive and intensive properties, state functions.

First law of thermodynamics -internal energy and enthalpy, heat capacity and specific heat, measurement of  $\Delta U$  and  $\Delta H$ , Hess's law of constant heat summation, enthalpy of bond dissociation, combustion, formation, atomization, sublimation, phase transition, ionization, solution and dilution. Second law of Thermodynamics (brief introduction)

Introduction of entropy as a state function, Gibb's energy change for spontaneous and non-spontaneous processes, criteria for equilibrium.

Third law of thermodynamics (brief introduction).

**AUGUST****Unit VIII: Redox Reactions****06 Periods**

Concept of oxidation and reduction, redox reactions, oxidation number, balancing redox reactions, in terms of loss and gain of electrons and change in oxidation number, applications of redox reactions.

**SEPTEMBER****Unit X: s-Block Elements (Alkali and Alkaline Earth Metals)****10 Periods**

Group 1 and Group 2 Elements

General introduction, electronic configuration, occurrence, anomalous properties of the first element of each group, diagonal relationship, trends in the variation of properties (such as ionization enthalpy, atomic and ionic radii), trends in chemical reactivity with oxygen, water, hydrogen and halogens, uses.

Preparation and Properties of Some Important Compounds:

Sodium Carbonate, Sodium Chloride, Sodium Hydroxide and Sodium Hydrogen carbonate, Biological importance of Sodium and Potassium.

Calcium Oxide and Calcium Carbonate and their industrial uses, biological importance of Magnesium and Calcium.

### **Unit XI: Some p -Block Elements**

**14 Periods**

General Introduction to p -Block Elements

Group 13 Elements: General introduction, electronic configuration, occurrence, variation of properties, oxidation states, trends in chemical reactivity, anomalous properties of first element of the group, Boron - physical and chemical properties, some important compounds, Borax, Boric acid, Boron Hydrides, Aluminium: Reactions with acids and alkalies, uses.

### **PRACTICAL**

#### **F. Qualitative Analysis**

**Cations-**  $\text{Pb}^{2+}$ ,  $\text{Cu}^{2+}$ ,  $\text{As}^{3+}$ ,  $\text{Al}^{3+}$ ,  $\text{Fe}^{3+}$ ,  $\text{Mn}^{2+}$ ,  $\text{Ni}^{2+}$ ,  $\text{Zn}^{2+}$ ,  $\text{Co}^{2+}$ ,  $\text{Ca}^{2+}$ ,  $\text{Sr}^{2+}$ ,  $\text{Ba}^{2+}$ ,  $\text{Mg}^{2+}$

**Anions -**  $\text{CO}_3^{2-}$ ,  $\text{S}^{2-}$ ,  $\text{SO}_3^{2-}$ ,  $\text{SO}_4^{2-}$ ,  $\text{NO}_2^-$ ,  $\text{Cl}^-$ ,  $\text{Br}^-$ ,  $\text{I}^-$ ,  $\text{PO}_4^{3-}$ ,  $\text{C}_2\text{O}_4^{2-}$ ,  $\text{CH}_3\text{COO}^-$

(Note: Insoluble salts excluded)

(b) Detection of -Nitrogen, Sulphur, Chlorine in organic compounds.

## **OCTOBER**

### **Unit XI: Some p -Block Elements (Contd.)**

Group 14 Elements: General introduction, electronic configuration, occurrence, variation of properties, oxidation states, trends in chemical reactivity, anomalous behaviour of first elements. Carbon-catenation, allotropic forms, physical and chemical properties; uses of some important compounds: oxides. Important compounds of Silicon and a few uses: Silicon Tetrachloride, Silicones, Silicates and Zeolites, their uses.

### **Unit IX: Hydrogen**

**08 Periods**

Position of hydrogen in periodic table, occurrence, isotopes, preparation, properties and uses of hydrogen, hydrides-ionic covalent and interstitial; physical and chemical properties of water, heavy water, hydrogen peroxide -preparation, reactions and structure and use; hydrogen as a fuel.

### **PRACTICAL**

#### **C. Experiments based on pH**

(a) Any one of the following experiments:

1. Determination of pH of some solutions obtained from fruit juices, solution of known and varied concentrations of acids, bases and salts using pH paper or universal indicator.
2. Comparing the pH of solutions of strong and weak acids of same concentration.
3. Study the pH change in the titration of a strong base using universal indicator.

(b) Study the pH change by common-ion in case of weak acids and weak bases.

## NOVEMBER

### **Unit XII: Organic Chemistry -Some Basic Principles and Techniques** **14 Periods**

General introduction, methods of purification, qualitative and quantitative analysis, classification and IUPAC nomenclature of organic compounds. Electronic displacements in a covalent bond: inductive effect, electromeric effect, resonance and hyper conjugation.

Homolytic and heterolytic fission of a covalent bond: free radicals, carbocations, carbanions, electrophiles and nucleophiles, types of organic reactions.

### **Unit XIII: Hydrocarbons** **12 Periods**

Classification of Hydrocarbons

Aliphatic Hydrocarbons: Alkanes - Nomenclature, isomerism, conformation (ethane only), physical properties, chemical reactions including free radical mechanism of halogenation, combustion and pyrolysis. Alkenes - Nomenclature, structure of double bond (ethene), geometrical isomerism, physical properties, methods of preparation, chemical reactions: addition of hydrogen, halogen, water, hydrogen halides (Markownikov's addition and peroxide effect), ozonolysis, oxidation, mechanism of electrophilic addition. Alkynes - Nomenclature, structure of triple bond (ethyne), physical properties, methods of preparation, chemical reactions: acidic character of alkynes, addition reaction of - hydrogen, halogens, hydrogen halides and water. Aromatic Hydrocarbons: Introduction, IUPAC nomenclature, benzene: resonance, aromaticity, chemical properties: mechanism of electrophilic substitution.

Nitration, sulphonation, halogenation, Friedel Craft's alkylation and acylation, directive influence of functional group in monosubstituted benzene. Carcinogenicity and toxicity.

## DECEMBER

### REVISION FOR DECEMBER EXAMINATION

## JANUARY

### **Unit VII: Equilibrium** **14 Periods**

Equilibrium in physical and chemical processes, dynamic nature of equilibrium, law of mass action, equilibrium constant, factors affecting equilibrium - Le Chatelier's principle, ionic equilibrium- ionization of acids and bases, strong and weak electrolytes, degree of ionization, ionization of poly basic acids, acid strength, concept of pH, Henderson Equation, hydrolysis of salts (elementary idea), buffer solution, solubility product, common ion effect (with illustrative examples).

#### **PRACTICAL**

#### **D. Chemical Equilibrium**

One of the following experiments:

- Study the shift in equilibrium between ferric ions and thiocyanate ions by increasing/decreasing the concentration of either of the ions.
- Study the shift in equilibrium between  $[\text{Co}(\text{H}_2\text{O})_6]^{2+}$  and chloride ions by changing the concentration of either of the ions.

## **EXAMINATION SYLLABUS**

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### **AUGUST EXAMINATION**

Unit (1-6) and Unit 14.

### **DECEMBER EXAMINATION**

Unit 1 to 14.

### **FEBRUARY EXAMINATION**

Full Syllabus

**NOTE:** There will be a class test and assignment after every chapter.

## DETAILED SYLLABUS OF BIOLOGY

### OBJECTIVES

The prescribed syllabus is expected to:

- Promote understanding of basic principles of Biology.
- Encourage learning of emerging knowledge and its relevance to individual and society.
- Promote rational/scientific attitude to issues related to population, environment and development.
- Enhance awareness about environmental issues, problems and their appropriate solutions.
- Create awareness amongst the learners about diversity in the living organisms and developing respect for other living beings.
- Appreciate that the most complex biological phenomena are built on essentially simple processes.

### COURSE STRUCTURE (THEORY)

**Time: 3 Hours**

**Max. Marks: 70**

Unit	Title	Marks
1.	Diversity of Living Organism	07
2.	Structural Organisations in Plants and Animals	12
3.	Cell : Structure and Function	15
4.	Plant Physiology	18
5.	Human Physiology	18
<b>Total</b>		<b>70</b>

### PRACTICALS

Evaluation Scheme	Maximum Marks : 30
One Major Experiment	5 marks
One Minor Experiment	4 marks
Slide Preparation	5 marks
Spotting	7 marks
Practical record + viva Voce	4 marks
Project record + viva Voce	5 marks
<b>Total</b>	<b>30 marks</b>

## QUESTION PAPER DESIGN

Time 3 Hours

Max. Marks :70

S.No	Typology of questions	Very Short Answer (VSA) 1 mark	Short Answer-I (SA-I) 2 marks	Short Answer-II (SA-II) 3 marks	Value Based Questions 4 marks	Long Answer (5 marks)	Total marks	% Weightage
1	Remembering- (Knowledge based simple recall questions, to know specific facts, terms, concepts, principles, or theories, Identify, define, or recite, information)	2	1	1	-	-	7	10%
2	<b>Understanding- (Comprehension</b> – to be familiar with meaning and to understand conceptually, interpret, compare, contrast, explain, paraphrase information)	-	2	4	-	1	21	30%
3	<b>Application</b> (Use abstract information in concrete situation, to apply knowledge to new situations, Use given content to interpret a situation, provide an example, or solve a problem)	-	2	4	-	1	21	30%
4	<b>High Order Thinking skills</b> (Analysis & Synthesis-Classify, compare, contrast or differentiate between different pieces of information, Organize and /or integrate unique pieces of information from a variety of sources)	2	-	1	-	1	10	14%
5	<b>Evaluation and Multi-Disciplinary-</b> (Appraise, judge, and / or justify the value or worth of a decision or outcome, or to predict outcomes based on values)	1	-	2	1	-	11	16%
	<b>TOTAL</b>	<b>5x1=5</b>	<b>5x2=10</b>	<b>12x3=36</b>	<b>1x4=4</b>	<b>3x5=15</b>	<b>70 (26)</b>	<b>100%</b>

**Note:** The question paper will include a Section on Open Case based –Questions on two case studies of 7 marks each from the syllabus, a total of 14 marks. The case studies will be supplied to students in advance. These case studies are designed to test the analytical and higher order thinking skills of students.

## ANNUAL SYLLABUS BREAK UP

### APRIL

#### Unit I: Diversity of Living Organism

##### Chapter 1: The Living World

What is living? Biodiversity: Need for classification; three domains of life; taxonomy and systematics; concept of species and taxonomical hierarchy; binomial nomenclature; tools for study of taxonomy- Museums, zoological parks, herbaria, botanical gardens.

##### Chapter 2: Biological classification

Five kingdom classification, Salient features and classification of Monera, Protista and Fungi into major groups: Lichens, Viruses and Viroids.

##### Chapter 3: Plant Kingdom

Salient features and classification of plants into major groups - Algae, Bryophyta, Pteridophyta, Gymnospermae and Angiospermae (three to five salient and distinguishing features and at least two examples of each category); Angiosperms - classification upto class, characteristic features and examples.

##### Chapter 4: Animal Kingdom

Salient features and classification of animals non chordates up to phyla level and chordates up to class level (three to five salient features and at least two examples of each category). (No live animals or specimen should be displayed.)

##### Practical :

- study parts of compound microscope.
- study of the specimens and identification reason-bacteria, oscillatoria, s pirogyra, rhizopus, mushroom, yeast, liverwort, moss, fern, pinus, one monocotyledon, one dicotyledon and one lichen.

### MAY-JUNE

#### Unit 2: Structural Organisation in Animals and Plants

##### Chapter 5: Morphology of flowering Plants

Morphology and modifications, Tissues; anatomy and functions of different parts of flowering plants: root, stem, leaf, inflorescence, flower, fruit and seed (to be dealt along with the relevant practical of the Practical Syllabus).

##### Chapter 6: Anatomy of Flowering Plants

(a brief account only) (to be dealt along with the relevant practical of the Practical Syllabus).

##### Chapter 7: Structural organization in Animals

Animal tissues, Morphology, anatomy and functions of different systems (digestive, circulatory, respiratory, nervous and reproductive) of an insect (cockroach).

**Practical:**

- Study and describe three common flowering plants (Solanaceae, Fabaceae & liliaceae)
- Preparation and study of T.S. of Dicot and monocot roots and stems (Normal)
- Study of different modifications in root stem and leaves.
- study and identify different types of inflorescence.
- study of tissue and diversity in shapes and sizes for plant and animal cells. (e.g. Palisade cells, guard cells, parenchyma, collenchyma, sclerenchyma, xylem, phloem, Squamous epithelium, muscle fibers and mammalian blood smear) through temporary/permanent slides.

**JULY****Unit 3: Cell Structure and Function****Chapter 8: Cell: The Unit of Life**

Cell theory and cell as the basic unit of life, Structure of prokaryotic and eukaryotic cells; Plant cell and animal cell; Cell envelope, cell membrane, cell wall; Cell organelles - structure and function; endomembrane system, endoplasmic reticulum, Golgi bodies, lysosomes, vacuoles; mitochondria, ribosomes, plastids, microbodies; cytoskeleton, cilia, flagella, centrioles (ultrastructure and function); nucleus, nuclear membrane, chromatin, nucleolus. Chemical

**Chapter 9: Biomolecule**

Constituents of living cells: biomolecules, structure and function of proteins, carbohydrates, lipids, nucleic acids, enzymes, types, properties, enzyme action.

**Chapter 10: Cell Cycle and Cell Division**

Cell cycle, mitosis, meiosis and their significance.

**Practical:**

- Study of mitosis in onion root tip cells and animal cells (grass hopper) from permanent slides.
- Study of external morphology of earthworm. Cockroach & frog through models.

**AUGUST****Unit 4: Plant Physiology****Chapter 11: Transport in plants**

Movement of water, gases and nutrients; cell to cell transport, Diffusion, facilitated diffusion, active transport; plant-water relations, Imbibition, water potential, osmosis, plasmolysis

**SEPTEMBER****Unit 4: Plant Physiology****Chapter 11: Transport in plants (Contd.)**

long distance transport of water - Absorption, apoplast, symplast, transpiration pull, root pressure and guttation; transpiration, opening and closing of stomata; Uptake and translocation of mineral nutrients - Transport of food, phloem transport, massflow hypothesis; diffusion of gases.



### **Chapter 12: Mineral nutrition**

Essential minerals, macro- and micronutrients and their role; deficiency symptoms; mineral toxicity; elementary idea of hydroponics as a method to study mineral nutrition; nitrogen metabolism, nitrogen cycle, biological nitrogen fixation.

### **Chapter 13: Photosynthesis in higher plants**

Photosynthesis as a mean of autotrophic nutrition; site of photosynthesis, pigments involved in photosynthesis (elementary idea); photochemical and biosynthetic phases of photosynthesis; cyclic and non-cyclic photophosphorylation; chemiosmotic hypothesis; photorespiration; C3 and C4 pathways; factors affecting photosynthesis.

#### **Practical:**

- Study of osmosis by potato osmometer-
- Study of plasmolysis in epidermal peels (eg. Rhoeo leaves)
- Study of distribution of stomata in upper and lower surface of leaves and calculate the stomatal index.  $\text{stomatal index} = \frac{\text{No of stomata}}{(\text{no of stomata} + \text{no of epidermal cells})} \times 100$
- Comparative study of the rate of transpiration in the lower and upper surface of leaves.

## **OCTOBER**

### **Chapter 14: Respiration in Plants**

Exchange of gases; cellular respiration - glycolysis, fermentation (anaerobic), TCA cycle and electron transport system (aerobic); energy relations - number of ATP molecules generated; amphibolic pathways; respiratory quotient.

### **Chapter 15: Plant growth and development**

Seed germination; phases of plant growth and plant growth rate; conditions of growth; differentiation, dedifferentiation and redifferentiation; sequence of developmental processes in a plant cell; growth regulators - auxin, gibberellin, cytokinin, ethylene, ABA; seed dormancy; vernalisation; photoperiodism.

#### **Practical :**

- Test for the presence of sugar starch proteins and fats in food material
- To detect them in suitable plant and animal materials.
- Separate plant pigments through proper absorption.
- Study the rate of respiration in flower bud/leaf tissues and germinating seeds

## **NOVEMBER**

### **Unit 5: Human Physiology**

#### **Chapter 16: Digestion and absorption**

Alimentary canal and digestive glands, role of digestive enzymes and gastrointestinal hormones; Peristalsis, digestion, absorption and assimilation of proteins, carbohydrates and fats; calorific values of proteins, carbohydrates and fats; egestion; nutritional and digestive disorders - PEM, indigestion, constipation, vomiting, jaundice, diarrhoea.

### **Chapter 17: Breathing and Exchange of gases**

Respiratory organs in animals (recall only); Respiratory system in humans; mechanism of breathing and its regulation in humans - exchange of gases, transport of gases and regulation of respiration, respiratory volume; disorders related to respiration - asthma, emphysema, occupational respiratory disorders.

### **Chapter 18: Body fluids and circulation**

Composition of blood, blood groups, coagulation of blood; composition of lymph and its function; human circulatory system - Structure of human heart and blood vessels; cardiac cycle, cardiac output, ECG; double circulation; regulation of cardiac activity; disorders of circulatory system - hypertension, coronary artery disease, angina pectoris, heart failure

#### **Practical:**

- To study the effect of different temperature on the activity of salivary amylase on starch.
- To test the presence of urea, albumin, sugar and bile salts in urine.

## **DECEMBER**

### **Chapter 19: Excretory products and their elimination**

Modes of excretion - ammonotelism, ureotelism, uricotelism; human excretory system - structure and function; urine formation, osmoregulation; regulation of kidney function - renin - angiotensin, atrial natriuretic factor, ADH and diabetes insipidus; role of other organs in excretion; disorders - uraemia, renal failure, renal calculi, nephritis; dialysis and artificial kidney.

## **JANUARY**

### **Chapter 20: Locomotion and movement**

Types of movement - ciliary, flagellar, muscular; skeletal muscle- contractile proteins and muscle contraction; skeletal system and its functions; joints; disorders of muscular and skeletal system - myasthenia gravis, tetany, muscular dystrophy, arthritis, osteoporosis, gout.

### **Chapter 21: Neural control and coordination**

Neuron and nerves; Nervous system in humans - central nervous system; peripheral nervous system and visceral nervous system; generation and conduction of nerve impulse; reflex action; sensory perception; sense organs; elementary structure and functions of eye and ear.

### **Chapter 22: Chemical coordination and Integration**

Endocrine glands and hormones; human endocrine system - hypothalamus, pituitary, pineal, thyroid, parathyroid, adrenal, pancreas, gonads; mechanism of hormone action (elementary Idea); role of hormones as messengers and regulators, hypo - and hyperactivity and related disorders; dwarfism, acromegaly, cretinism, goiter, exophthalmic goiter, diabetes, Addison's disease.

Note: Diseases related to all the human physiological systems to be taught in brief

#### **Practical:**

- Study of imbibition in seeds/ raisins.
- Observation and comment on the experimental setup an aerobic respiration, phototropism, apical bud removal, suction due to transpiration.
- Study of human skeleton and different types of joints.

## **EXAMINATION SYLLABUS**

### **AUGUST EXAMINATION**

Unit I, II and III.

### **DECEMBER EXAMINATION**

Chapter 1 to 18.

### **FEBRUARY EXAMINATION**

Full syllabus

**NOTE:** There will be a class test and assignment after every chapter.

## DETAILED SYLLABUS OF COMPUTER SCIENCE

### OBJECTIVES

1. To understand basics of computers.
2. To develop logic for Problem Solving.
3. To develop problem solving skills and their implementation through **Python (version: 2.7)** or using C++.
4. To understand and implement the concept of Object Oriented Methodology.
5. To understand the concept of working with Relational Database.
6. To understand the basic concept of Computing Logic.
7. To understand the basic concepts of Communication and Networking technologies.
8. To understand Open Source Software.

### COURSE STRUCTURE

**Duration: 3 hours**

**Total Marks: 70**

Unit No.	Unit Name	Marks		
		Theory	Practical	Total
1	COMPUTER FUNDAMENTALS	10	2	12
2	INTRODUCTION TO C++	14	8	22
3	PROGRAMMING METHODOLOGY	10	2	12
4	PROGRAMMING IN C++	36	18	54
		70	30	100

## ANNUAL SYLLABUS BREAK UP

### APRIL

#### Chapter 1: Computer Fundamentals

##### Evolution of computers:

Basics of computer and its operation; Functional Components and their Interconnections, concept of Booting. Classification of Computers.

#### Chapter 2: Software Concepts

Types of Software - System Software, Utility Software and Application Software.

**System Software:** Operating System, Compiler, Interpreter and Assembler.

**Operating System:** Need for Operating System, Functions of Operating System (Processor Management, Memory Management, File Management and Device Management), Types of Operating System interactive(GUI based), Time Sharing, Real Time and Distributed, Commonly used operating system: UNIX, LINUX, Windows, Solaris, BOSS (Bharat Operating System Solutions); Mobile OS - Android, Symbian.

**Utility Software:** Anti-Virus, File Management tools, Compression tools and Disk Management tools (Disk Cleanup, Disk Defragmenter, Backup).

**Open Source Concepts:** Open Source Software, Freeware, Shareware, Proprietary Software.

**Application Software:** Office Tools - Word Processor, Presentation Tool, Spreadsheet Package, Database Management System; Domain Specific tools - School Management System, Inventory Management System, Payroll System, Financial Accounting, Hotel Management, Reservation System and Weather Forecasting System.

#### Chapter 3: Data Representation in Computers

**Number System:** Binary, Octal, Decimal, Hexadecimal and conversion between two different number systems.

**Internal Storage encoding of Characters:** ASCII, ISCII (Indian scripts Standard Code for Information Interchange), and UNICODE (for multilingual computing).

### MAY-JUNE

#### Chapter 4: Microprocessor and Memory Concepts

**Microprocessor:** Basic concepts, Clock speed (MHz, GHz), 16 bit, 32 bit, 64 bit processors; 128 bit processors; Types - CISC Processors (Complex Instruction set computing), RISC Processors (Reduced Instruction set Computing), and EPIC (Explicitly parallel Instruction computing).

**Memory Concepts:** Units: Byte, Kilo Byte, Mega Byte, Giga Byte, Tera Byte, Peta Byte, Exa Byte, Zetta Byte, Yotta Byte.

**Primary Memory:** Cache, RAM, ROM

**Secondary Memory:** Fixed and Removable storage - Hard Disk Drive, CD/DVD Drive, Pen Drive, Blue Ray Disk.

**Input Output Ports/ Connections:** Serial, Parallel and Universal Serial Bus, PS-2 port, Infrared port, Bluetooth, Firewire.

#### Chapter 5: Algorithms and Flowcharts

## JULY

### Chapter 6: Programming Methodology

**General Concepts:** Modular Approach, Clarity and Simplicity of Expressions, Use of proper names for Identifiers, Comments, Indentation; Documentation and Program Maintenance; Running and Debugging programs, Syntax Errors, Run-Time Errors, Logical Errors

**Problem solving Methodologies:** Understanding of the problem, solution for the problem, identifying minimum number of inputs required for output, writing code to optimizing execution time and memory storage, step by step solution for the problem, breaking down solution into simple steps (modular approach), identification of arithmetic and logical operations required for solution; Control Structure conditional control and looping (finite and infinite).

**Problem Solving:** Introduction to Algorithms/Flowcharts.

### Chapter 7: Getting Started with C++

C++ character set, C++ Tokens (Identifiers, Keywords, Constants, Operators,), Structure of a C++ Program (include files, main function), Header files - iostream.h, iomanip.h, cout, cin; use of I/O operators (<<and>>), Use of endl and setw (), Cascading of I/O operators; Compilation, Error Messages and execution.

### Chapter 8: Data Handling

**Data Types, Variables and Constants:** Concept of Data types; Built-in Data types: char, int, float and double; Constants: Integer Constants, Character constants - \n, \t, \b), Floating Point Constants, String Constants; Access modifier; Variables of built-in-data types, Declaration/Initialization of variables, Assignment statement, Type modifier: signed, unsigned, long.

## AUGUST

### REVISION FOR AUGUST EXAMINATION

## SEPTEMBER

### Chapter 9: Operators and Expressions in C++

**Operator and Expressions:** Operators: Arithmetic operators (-,+,\*,/,%), Assignment operator(=),C++ shorthands (+=,- =,\*=,/=,%=) Unary operator (-), Increment(++ and Decrement (--)) Operators, Relation operator (>,>=,<=,!=), Logical operators (!,&&,||),Conditional operator; Precedence of Operators; Automatic type conversion in expressions, Type casting.

## OCTOBER

### Chapter 10: Flow of Control

**Conditional statements:** if else, Nested if, switch..case.. default, Nested switch..case, break statement (to be used in switch case only);

**Loops:** while, do - while, for and Nested loops.

## NOVEMBER

### Chapter 11: Functions

#### Inbuilt Functions

Header file Categorization	Header File	Function
Standard input/output functions	stdio.h	gets ( ), puts ( )
Character Functions	Ctype.h	isalnum ( ), isalpha ( ), isdigit ( ), islower ( ), isupper ( ), tolower ( ), toupper ( )
String Function	string.h	strcpy ( ), strcat ( ), strlen ( ), strcmp ( ), strcmpi ( ), strcmp ( ), strlen ( ),strupur ( ),strlwr ( )
Mathematical Functions	math.h	fabs ( ), pow ( ), sqrt ( ), sin ( ), cos ( ), abs ( )
Other Functions	stdlib.h	randomize ( ), random ( )

#### Introduction to user-defined function and its requirements.

Defining a function; function prototype, Invoking/calling a function, passing arguments to function, specifying argument data types, default argument, constant argument, call by value, call by reference, returning values from a function, scope rules; local and global variables.

### Chapter 12: Arrays

Introduction to Array and its advantages.

**One Dimensional Array :** Declaration/initialization of One-dimensional array, inputting array elements, accessing array elements, manipulation of array elements (sum of elements, product of elements, average of elements, linear search, finding maximum/minimum value)

Declaration / Initialization of a String, string manipulations (counting vowels/ consonants/ digits/ special characters, case conversion, reversing a string, reversing each word of a string.

## DECEMBER

### Chapter 12: Arrays (contd.)

#### Two-dimensional Array:

Declaration/initialization of a two-dimensional array, inputting array elements accessing array elements, manipulation of array elements (sum of row element, column elements, diagonal elements, finding maximum / minimum values).

## JANUARY

### Chapter 13: Structure

Defining a Structure, declaring structure variables, accessing structure elements, passing sstructure to functions as value and reference, function returning structure, array of structure  
Defining a symbol name using **typedef** keyword and defining a macro using **#define** preprocessor directive.

## **EXAMINATION SYLLABUS**

### **AUGUST EXAMINATION**

Chapter 1 to 8.

### **DECEMBER EXAMINATION**

Chapter 1 to 11.

### **FEBRUARY EXAMINATION**

Full syllabus

**NOTE:** There will be a class test and assignment after every chapter.



## DETAILED SYLLABUS OF PHYSICAL EDUCATION

### THEORY

**MM 70**

- Unit 1:** Physical Fitness, Wellness And Life Style
- Unit 2:** Changing Trends And Career In Physical Education
- Unit 3:** Olympic Movement
- Unit 4:** Yoga
- Unit 5:** Doping
- Unit 6:** Management Of Injuries
- Unit 7:** Test And Measurement In Sports
- Unit 8:** Fundamentals Of Anatomy And Physiology
- Unit 9:** Biomechanics And Sports
- Unit 10:** Psychology And Sports
- Unit 11:** Training In Sports

### PRACTICAL

**MM: 30**

1. Physical fitness [5marks]
2. Athletics – any two events – sprints and jumps [5marks]
3. Health and fitness activities – medicine bawl/theratube/plates/ropes keeping (any one) [5marks]
4. Skill on any one individual game of choice from given list- badminton, judo, swimming, table tennis, taekwondo and tennis[5 marks]
5. Viva [5marks]
6. Record file [5marks]

## ANNUAL SYLLABUS BREAK UP

### APRIL

#### CHAPTER 1: PHYSICAL FITNESS, WELLNESS AND LIFESTYLE

- Meaning and importance of Physical Fitness, Wellness and Lifestyle
- Factors affecting Physical Fitness and Wellness
- Indicators of Health - Physical and Psychological
- Preventing Health Threats through Lifestyle Change
- Components of positive lifestyle

### MAY -JUNE

#### CHAPTER 2: CHANGING TRENDS AND CAREER IN PHYSICAL EDUCATION

- Define Physical Education, its Aims and Objectives
- Development of Physical Education - Post Independence
- Concept and Principles of Integrated Physical Education
- Concept and Principles of Adaptive Physical Education
- Career Options in Physical Education

#### CHAPTER 3: OLYMPIC MOVEMENT

- Ancient and Modern Olympics
- Olympic Symbols, Ideals, Objectives and Values
- International Olympic Committee
- Indian Olympic Association
- Dronacharya Award, Arjuna Award and Rajiv Gandhi Khel Ratna Award
- Organisational set-up of CBSE Sports and Chacha Nehru Sports Award

### JULY

#### CHAPTER 4: YOGA

- Meaning and Importance of Yoga
- Yoga as an Indian Heritage
- Elements of Yoga
- Introduction to - Asanas, Pranayam, Meditation and Yogic Kriyas
- Prevention and Management of Common Lifestyle Diseases; Obesity, Diabetes, Hyper- Tension And Back-Pain

#### CHAPTER 5: DOPING

- Meaning and types of Doping
- Prohibited substances and methods
- Athletes responsibilities
- Testing - in competition and Out-of-Competition
- Side effects of prohibited substances

### AUGUST

REVISION FOR AUGUST EXAMINATION

### SEPTEMBER

#### CHAPTER 6: MANAGEMENT OF INJURIES

- Common sports injuries of soft Tissues, Joints and Bones

- First-Aid in Common Sports Injuries
- Prevention of Sports injuries
- Rehabilitation through Massage and Exercise

#### **CHAPTER 7: TEST AND MEASUREMENT IN SPORTS**

- Define Test and Measurement
- Importance of Test and Measurement in Sports
- Calculation of BMI and Waist - Hip Ratio
- Somato Types (Endomorphy, Mesomorphy and Ectomorphy)
- Procedures of Anthropometric Measurement - Height, Weight, Arm and Leg Length and Skin Fold

#### **OCTOBER**

#### **CHAPTER 8: FUNDAMENTALS OF ANATOMY AND PHYSIOLOGY**

- Define Anatomy, Physiology and its importance
- Function of skeleton system, Classification of bones and types of joints
- Function and structure of muscles
- Function and structure of Respiratory System
- Structure of Heart and introduction to Circulatory System

#### **NOVEMBER**

#### **CHAPTER 9 :BIOMECHANICS AND SPORTS**

- Meaning and Importance of Biomechanics in Physical Education and Sports
- Newton's Law of Motion and its application in sports
- Levers and its types and its application in Sports
- Equilibrium - Dynamic and Static and Centre of Gravity and its application in sports
- Force - Centrifugal and Centripetal and its application in Sports

#### **DECEMBER**

#### **REVISION FOR DECEMBER EXAMINATION**

#### **CHAPTER 10:PSYCHOLOGY AND SPORTS**

- Definition and importance of Psychology in Physical Education and Sports
- Define and differentiate between 'Growth and Development'
- Developmental characteristics at different stage of development
- Adolescent problems and their management
- Define Learning, Laws of Learning and transfer of Learning

#### **JANUARY**

#### **CHAPTER 11: TRAINING IN SPORTS**

- Meaning and Concept of Sports Training
- Principles of Sports Training
- Warming up and limbering down
- Load, Adaptation and Recovery
- Skill, Technique and Style.

## **EXAMINATION SYLLABUS**

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### **AUGUST EXAMINATION**

Chapter 1, 2, 3, 4 and 5.

### **DECEMBER EXAMINATION**

Chapter (1 to 10).

### **FEBRUARY EXAMINATION**

Full Syllabus

**NOTE:** There will be a class test and assignment after every chapter.