

## ENGLISH (301)

### PRESCRIBED BOOKS:

1. Hornbill: English Reader published by National Council of Education Research and Training, New Delhi
2. Snapshots: Supplementary Reader published by National Council of Education Research and Training, New Delhi

### QUESTION SPECIFICATION

- **TERM-I:** will have Multiple Choice Questions (MCQ) including MCQs on case-based passage and MCQs on Gap filling/ Transformation of Sentences from grammar.
- **TERM-II:** will have questions of different formats (case-based/ situation based, open ended- short answer/ long answer type).

### COURSE STRUCTURE (THEORY)TERM-I

Time : 90 minutes

F.M:40

Section	TYPE OF TEST	TERM-I
	TIME PERIOD OF THE TEST	NOVEMBER-DECEMBER 2021
	NAME OF THE CHAPTER	
A	Reading Comprehension:	
	<ul style="list-style-type: none"><li>• Unseen passage (factual, descriptive or literary/ discursive or persuasive)</li><li>• Case Based Unseen (Factual) Passage</li></ul>	8 5
B	<b>Creative Writing Skills and Grammar:</b>	
	<b><u>Short Writing Tasks</u></b>	
	<ul style="list-style-type: none"><li>• Notice Writing</li></ul>	3
	<b><u>Long Writing Tasks</u></b>	
<ul style="list-style-type: none"><li>• Business or Official Letters(Making enquiries, registering complaints, asking for or giving information, placing orders and sending replies)</li></ul>	5	
<ul style="list-style-type: none"><li>• Speech</li></ul>		
<b><u>Grammar</u></b>		4
<ul style="list-style-type: none"><li>• Determiners</li><li>• Tenses</li><li>• Re-ordering of Sentences</li></ul>		

	{MCQs on Gap filling/ Transformation of Sentences}	
C	<p><b>Literature:</b> Literary-prose/poetry extracts (seen- texts) comprehension and appreciation. (Two Extracts) Questions Based on Texts to assess comprehension and appreciation, analysis, inference, extrapolation</p> <p><b>Book-Hornbill:</b></p> <ul style="list-style-type: none"> <li>• The Portrait of a Lady (Prose)</li> <li>• A Photograph (Poem)</li> <li>• “We’re Not Afraid to Die... if We Can All Be Together” (Prose)</li> <li>• Discovering Tut: The Saga Continues</li> <li>• The Laburnum Top (Poem)</li> <li>• Landscape of the Soul (Prose)</li> </ul> <p><b>Book-Snapshots:</b></p> <ul style="list-style-type: none"> <li>• The Summer of the Beautiful White Horse (Prose)</li> <li>• The Address (Prose)</li> <li>• Ranga’s Marriage (Prose)</li> </ul>	<p style="text-align: center;"><b>9 Marks for Hornbill</b></p> <p style="text-align: center;"><b>6 Marks for Snapshots</b></p>
	<b>Total</b>	<b>40</b>

**Term I: 10 Marks**  
**Assessment of Listening and Speaking Skills**

**i. Activities:**

- Subject teachers must refer to books prescribed in the syllabus.
- In addition to the above, teachers may plan their own activities and create their own material for assessing the listening and speaking skills.

**ii. Parameters for Assessment:** The listening and speaking skills are to be assessed on the following parameters:

- a. Interactive competence (Initiation & turn taking, relevance to the topic)
- b. Fluency (cohesion, coherence and speed of delivery)
- c. Pronunciation
- d. Language (grammar and vocabulary)

**iii. Schedule:**

- The practice of listening and speaking skills should be done throughout the academic year.
- The final term I assessment of the skills is to be done as per the convenience and schedule of the school.

## COURSE STRUCTURE (THEORY) ANNUAL

Time: 2Hrs

F.M:40

SECTION	TYPE OF TEST	ANNUAL
	TIME PERIOD OF THE TEST	MARCH-APRIL 2022
	NAME OF THE CHAPTER	
<b>A</b>	<b>Reading Comprehension:</b>	
	• Unseen passage (factual, descriptive or literary /discursive or persuasive)	<b>8</b>
	• Unseen passage for Note Making and Summarising	<b>5</b>
		<b>13</b>
<b>B</b>	<b>Creative Writing Skills and Grammar:</b>	
	<b>Short Writing Tasks</b>	
	• Posters	<b>3</b>
	<b>Long Writing Tasks</b>	
• Official Letters: e.g., to school/college authorities (regarding admissions, school issues, requirements / suitability of courses)	<b>5</b>	
• Debate		
<b>Grammar</b>		
• Determiners		
• Tenses		
• Re-ordering of Sentences	<b>4</b>	
{MCQs on Gap filling/ Transformation of Sentences}		
		<b>12</b>
<b>C</b>	<b>Literature:</b>	
	Questions based on extracts/texts to assess comprehension and appreciation, analysis, inference, extrapolation	
	<b>Book-Hornbill:</b>	<b>9 Marks</b>

<ul style="list-style-type: none"> <li>• The Voice of the Rain (Poem)</li> <li>• The Ailing Planet: The Green Movement’s Role (Prose)</li> <li>• The Browning Version(Play)</li> <li>• Childhood (Poem)</li> <li>• Silk Road (Prose)</li> </ul> <p><b>Book-Snapshots:</b></p> <ul style="list-style-type: none"> <li>• Albert Einstein at School (Prose)</li> <li>• Mother’s Day (Play)</li> <li>• Birth (Prose)</li> </ul>	<p><b>for Hornbill</b></p>
	<p><b>6 Marks for Snapshots</b></p>
<b>Total</b>	<b>15 Marks</b>
	<b>40</b>

## PRACTICAL SYLLABUS

### Term II: 10 Marks

#### Project Work + Viva

Out of ten marks allotted for the term, 5 marks will be allotted for the project report/script /essay etc. and 5 marks for the viva.

#### Suggestions for Project Work:

- The Project can be inter-disciplinary in theme. The ideas/issues highlighted in the chapters/ poems/ drama given the prescribed books can also be developed in the form of a project. Students can also take up any relevant and age-appropriate theme.
- Such topics may be taken up that provide students with opportunities for listening and speaking.
- Some suggestions are as follows: **a. Interview-Based research:**

#### Example:

- Students can choose a topic on which to do their research/ interview, e.g. a student can choose the topic: “Evolving food tastes in my neighbourhood” or “Corona pandemic and the fallout on families.” Read the available literature.
- The student then conducts interviews with a few neighbours on the topic. For an interview, with the help of the teacher, student will frame questions based on the preliminary research/background.
- The student will then write an essay/ write up / report etc. up to 1000 words on his/her research and submit it. He / She will then take a viva on the research project. The project can be done in individually or in pairs/ groups

**b.** Listen to podcasts/ interviews/radio or TV documentary on a topic and prepare a report countering or agreeing with the speakers. Write an 800 - 1000 words report and submit. Take a viva on the report.

**c.** Students create their own video/ Audio, after writing a script. Before they decide a format, the following elements can be taken into consideration:

- Theme/topic of the audio / video. Would the child like to pick a current issue or something artistic like theatre?
- What are the elements that need to be part of the script?
- Will the video/audio have an interview with one or more guests?
- Would they prefer to improvise while chatting with guests, or work from a script?

- What would be the duration?
- How would they present the script/report to the teacher, e.g. Can it be in the form of a narrative?

#### **d. Write, direct and present a theatrical production, /One act play**

This will be a project which will be done as a team. It will involve planning, preparation and presentation. In short, various language skills will be utilised. There will be researching, discussion, writing the script, auditioning and ultimately producing the play. The project will end with a presentation and subsequently a viva. Teachers will be able to assess the core language skills of the students and help them grow as 21st century critical thinkers.

#### **Parameters for Overall Assessment:-**

##### **1. Pronunciation:**

- When evaluating the pronunciation of the students, teachers must listen for clearly articulated words, pronunciation of unusual spellings and intonation.
- Assess the students for the pronunciation skills and determine at which level the student needs improvement.

**2. Vocabulary:** After noting their pronunciation levels, evaluate the students on the use of extensive and appropriate **vocabulary** during the viva. Check if students are using vocabulary appropriate to the context about which they are speaking.

##### **3. Accuracy:**

Grammar has always been an important component of language skills. As students speak/ answer the questions during the viva, listen to their **grammatical structures**. *Are they competent enough to use multiple tenses? Is their word order correct in a given sentence?* An effective speaker will automatically use the correct grammatical structures of his language.

##### **4. Communication:**

Assessing the **communication skills** of the students means looking at more than language. Look at how creatively students use the language to make their points understood. Students with a low level of vocabulary and grammar may still have good communication skills if they are able to make the teacher understand their point of view.

##### **5. Interaction:**

- During the viva teachers need to ask the students some questions. Questions need to be based on the projects that have been suggested or chosen by the students.
- It is imperative for a teacher to read the essays/project reports before they can be ready to ask questions.
- Teachers need to observe how students answer the questions that are posed to them: *Are they able to understand and answer questions independently or can they answer only when the questions are translated into simpler words or repeated? Are they able to give appropriate responses in a conversation?*
- These elements of **interaction** are necessary for clear and effective communication. A student with effective interaction skills will be able to answer questions with relative ease and follow the flow of conversation.

## 6. Fluency:

- Fluency may be the easiest quality to judge in the students' speech: *How comfortable are they as they speak and express themselves? How easily do the words come out? Are there inappropriate pauses and gaps in the way a student speaks?*
- **Fluency** is a judgement of this communication and is an important criterion when evaluating speaking skills. These criteria: pronunciation, vocabulary, accuracy, interaction and fluency are all the hallmarks of a student's overall speaking abilities.
- Teachers must also remember that some **students may excel in one area and struggle in another**. Helping the students understand these issues will enable them to become effective speakers in future. Let your students know that you will be assessing them in these various areas when you evaluate their progress and encourage them to work and improve in these areas.
- **Finally**, teachers must remember that a proper evaluation of the students will take into consideration **more than just one oral interview on the final ASL project**. Teachers must take note of a student's progress throughout the academic year.

## Project-Portfolio/ Project Report

The **Project-Portfolio/Project Report** is a compilation of the work that the students produce during the process of working on their ALS Project.

### **The Project-Portfolio may include the following:**

- Cover page, with title of project, school details/details of students.
- Statement of purpose/objectives/goals
- Certificate of completion under the guidance of the teacher.
- Action plan for the completion of assigned tasks.
- Materials such as scripts for the theatre/role play, questionnaires for interview, written assignments, essays, survey-reports and other material evidence of learning progress and academic accomplishment.
- The 800-1000 words essay/Script/Report.
- Student/group reflections.
- If possible, Photographs that capture the positive learning experiences of the student(s).
- List of resources/bibliography.

## MATHEMATICS (041)

### PRESCRIBED BOOKS :

1. Mathematics Textbook for Class XI, (NCERT Publication)
2. Mathematics Exemplar Problems for Class XI, (NCERT Publication)
3. Mathematics Lab Manual For Class XI, Published by NCERT
4. Laboratory Manual of Mathematics, Class XI Published by NCERT

### QUESTION SPECIFICATION

- **TERM-I** : will have Multiple Choice Questions(MCQ) including case-based MCQs and MCQs on assertion-reasoning type
- **TERM-II**: will have questions of different formats (case-based/situation based, open ended-short answer long answer type)

### COURSE STRUCTURE (THEORY) TERM-I

Sl. No	TYPE OF TEST		TERM – I (40 marks)
	TIME PERIOD OF THE TEST		November/December - 2021
	Units	Name of the Topics for Term - I	Marks Distribution
1	I Sets & Functions	Sets	11
2		Relations & Functions	
3	II Algebra	Complex Numbers & Quadratic Equations	13
4		Sequence & Series	
5	III Coordinate Geometry	Straight lines	6
6	IV Calculus	Limits	4
7	V Statistics & Probability	Statistics	6
		<b>Total</b>	<b>40</b>
		<b>Internal Assessment</b>	<b>10</b>
		<b>Total</b>	<b>50</b>

## DETAIL SYLLABUS FOR TERM - I

### UNIT-I SETS AND FUNCTIONS

#### 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.

#### 2. Relations & Functions

Ordered pairs. Cartesian product of sets. Number of elements in the Cartesian product of two finite sets. Cartesian product of these two reals with itself ( $\mathbb{R} \times \mathbb{R}$  only). Definition of relation, pictorial diagrams, domain, co-domain and range of a relation. Function as a special type of relation. 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, exponential, logarithmic and greatest integer functions, with their graphs.

### UNIT-II ALGEBRA

#### 1. 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. Statement of Fundamental Theorem of Algebra, solution of quadratic equations (with real coefficients) in the complex number system.

#### 2. Sequence 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., infinite G.P. and its sum, geometric mean (G.M.), relation between A.M. and G.M.

### UNIT-III CO-ORDINATE GEOMETRY

#### 1. Straight Lines

Brief recall of two dimensional geometry from earlier classes. 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. Distance of a point from a line.



## UNIT-IV CALCULUS

### 1.Limits

Intuitive idea of limit. Limits of polynomials and rational functions trigonometric, exponential and logarithmic functions.

## UNIT-V STATISTICS AND PROBABILITY

### 1.Statistics

Measures of Dispersion: Range, mean deviation, variance and standard deviation of ungrouped/grouped data.

INTERNAL ASSESSMENT	TERM-I
Periodic Test/Chapter End Test/Unit Test	5Marks
Mathematics Activities: Activity file record +Term end assessment of one activity & Viva	5 Marks
Total	10

## ACTIVITY SYLLABUS

SL. NO	ACTIVITY	
1	ACTIVITY 1	To find the number of subsets of a given set
2	ACTIVITY 2	To represent set theoretic operations by using Venn Diagram
3	ACTIVITY 3	To verify for any two sets $A$ and $B$ , if $n(A) = p, n(B) = q$ , then the total number of relations from $A$ to $B$ is $2^{pq}$ .
4	ACTIVITY 4	To find analytically $\lim_{x \rightarrow c} f(x) = \frac{x^2 - c^2}{x - c}$

## COURSE STRUCTURES (THEORY) ANNUAL

Sl. No		TYPE OF TEST	ANNUAL (40 marks)
		TIME PERIOD OF THE TEST	March/April - 2022
	Units	Name of the Topics for Annual	Unit wise Marks Distribution
1	<b>I Sets &amp; Functions</b>	<b>** Functions</b>	<b>02</b>
2		<b>Trigonometric Functions</b>	<b>08</b>
3	<b>II Algebra</b>	<b>Linear Inequalities Permutations and Combinations</b>	<b>08</b>
4	<b>III Coordinate Geometry</b>	<b>** Straight Line</b>	<b>02</b>
5		<b>Conic Sections, Introduction to Three Dimensional Geometry</b>	<b>08</b>
6	<b>IV Calculus</b>	<b>**Limits</b>	<b>04</b>
7		<b>Derivatives</b>	<b>04</b>
8	<b>V Statistics and Probability</b>	<b>Statistics and Probability</b>	<b>04</b>
		<b>Total</b>	<b>40</b>
		<b>Internal Assessment</b>	<b>10</b>
		<b>Total</b>	<b>50</b>

## DETAIL SYLLABUS FOR ANNUAL

### UNIT-I SETS AND FUNCTIONS

#### 1. Trigonometric Functions

Positive and negative angles. Measuring angles in radians and in degrees and conversion from one measure to another. Definition of trigonometric functions with the help of unit circle. Truth of the identity  $\cos^2 x + \sin^2 x = 1$ , 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 applications. Deducing identities like the following:

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

$$\sin \alpha \pm \sin \beta = 2 \sin \frac{1}{2}(\alpha \pm \beta) \cos \frac{1}{2}(\alpha \mp \beta)$$

$$\cos \alpha + \cos \beta = 2 \cos \frac{1}{2}(\alpha + \beta) \cos \frac{1}{2}(\alpha - \beta)$$

$$\cos \alpha - \cos \beta = -2 \sin \frac{1}{2}(\alpha + \beta) \sin \frac{1}{2}(\alpha - \beta)$$

Identities related to  $\sin 2x$ ,  $\cos 2x$ ,  $\tan 2x$ ,  $\sin 3x$ ,  $\cos 3x$  and  $\tan 3x$ .

### UNIT-II ALGEBRA

#### 1. 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 method of finding a solution of system of linear inequalities in two variables.

#### 2. Permutations and Combinations

Fundamental principle of counting. Factorial  $n$ .  $(n!)$  Permutations and combinations, formula for  ${}^n P_r$  and  ${}^n C_r$ , simple application

## **UNIT-III CO-ORDINATE GEOMETRY**

### **1. Conic Sections**

Sections of a cone: circles, ellipse, parabola, hyperbola. Standard equations and simple properties of parabola, ellipse and hyperbola. Standard equation of a circle.

### **2. Introduction to Three-dimensional Geometry**

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

## **UNIT-IV CALCULUS**

### **1. Derivatives**

Derivative introduced as rate of change both as that of distance function and geometrically. Definition of Derivative, relate it to slope of tangent of the curve, derivative of sum, difference, product and quotient of functions. Derivatives of polynomial and trigonometric functions.

## **UNIT-V STATISTICS AND PROBABILITY**

### **1. Probability**

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

## **\*\*UNIT-I SETS AND FUNCTIONS**

Function as a special type of relation. 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, exponential, logarithmic and greatest integer functions, with their graphs.

## **\*\*UNIT-II CO-ORDINATE GEOMETRY**

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. Distance of a point from a line.

## **UNIT-IV CALCULUS**

Intuitive idea of limit. Limits of polynomials and rational functions trigonometric, exponential and logarithmic functions.

<b>INTERNAL ASSESSMENT</b>	<b>ANNUAL</b>
Periodic Test /Chapter End Test/Unit Test	5Marks
Mathematics Activities: Activity file record +Term end assessment of one activity &Viva	5 Marks
Total	10

## ACTIVITY SYLLABUS

Sl. No	ACTIVITY	
1	ACTIVITY 5	To plot the graph of $\sin x$ , $\sin 2x$ , $2\sin x$ , $\sin x/2$
2	ACTIVITY 6	Linear Inequalities
3	ACTIVITY 7	Sample space of throwing a Dice
4	ACTIVITY 8	Sample space of tossing a Coin

## APPLIED MATHEMATICS (241)

### PRESCRIBED BOOKS:

1. Mathematics Textbook for Class XI,(NCERT Publication)
2. Laboratory Manual of Mathematics, Class XI Published by NCERT

### QUESTION SPECIFICATION

- **TERM-I** : will have Multiple Choice Questions(MCQ) including case-based MCQs and MCQs on assertion-reasoning type
- **TERM-II**: will have questions of different formats(case-based/situation based, open ended-short answer long answer type)

### COURSE STRUCTURES(THEORY) TERM-I

Sl. No		TYPE OF TEST	TERM – I (40 marks)
		TIME PERIOD OF THE TEST	November/December - 2021
	Units	NAME OF THE CHAPTER	
1	<b>Unit- I</b> Numbers, Quantification and Numerical Applications	Number	<b>09</b>
2		Quantification and Numerical Applications	
3	<b>Unit-II</b> Algebra	sets	<b>09</b>
4		Relation	
5		Sequence and series	
6	<b>Unit-III</b>	Mathematical Reasoning	<b>06</b>
7	<b>Unit-IV</b>	Calculus	<b>04</b>
8	<b>Unit-VI</b>	Statistics	<b>12</b>
		<b>Total</b>	<b>40</b>
		<b>Internal Assessment</b>	<b>10</b>
		<b>Total</b>	<b>50</b>

## DETAIL SYLLABUS (THEORY) FOR TERM - I

### UNIT-I NUMBERS QUANTIFICATION AND NUMERICAL APPLICATIONS

Prime Numbers, Encryptions using Prime Numbers ,Binary Numbers, Complex Numbers (Preliminary idea only) ,Indices, Logarithm and Antilogarithm, Laws and properties of logarithms ,Simple applications of logarithm and antilogarithm .Numerical problems on averages, calendar, clock, time, work and distance, mensuration, seating arrangement

### UNIT-II ALGEBRA

Sets ,Types of sets ,Venn diagram, De Morgan's laws, Problem solving using Venn diagram, Relations and types of relations ,Introduction of Sequences, Series, Arithmetic and Geometric progression ,Relationship between AM and GM, Basic concepts of Permutations and Combinations, Permutations, Circular Permutations, Permutations with restrictions Combinations with standard results

### UNIT-III MATHEMATICAL AND LOGICAL REASONING

Mathematically acceptable statements, Connecting words/ phrases in Mathematical statement 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 .Problems based on logical reasoning(coding-decoding, odd man out, blood relation, syllogism etc)

### UNIT-IV CALCULUS

Introducing functions, Domain and Range of a function, Types of functions (Polynomial function; Rational function; Composite function; Logarithm function; Exponential function; Modulus function; Greatest Integer function, Signum function) Graphical representation of functions.

### UNIT-VI DESCRIPTIVE STATISTICS

Types of data (raw data, univariate data, bivariate and multi-variate data),Data on various scales (nominal, ordinal, interval and ratio scale) ,Data representation and visualization, Data interpretation (central tendency, dispersion, deviation, variance, skewness and kurtosis), Percentile rank and quartile rank ,Correlation (Pearson and Spearman method of correlation), Applications of descriptive statistics using real time data

#### **Practical: Use of spread sheet**

Calculating average, interest (simple and compound), creating pictographs, drawing pie chart, bar graphs, calculating central tendency; visualizing graphs.

#### **Suggested Projects using spreadsheet :**

1. Create a budget of income and spending
2. Prepare a report card using scores of the last four exams and compare the performance

3. Collect the data on weather, price, inflation, and pollution. Sketch different types of graphs and analyze the results

Term	Area and Weightage	Assessment Area	Marks allocated
Term I	Project	Project work and record	5
		Term-end Presentation + Viva of the Project	5
		Total	10

<b>COURSE STRUCTURES(THEORY) ANNUAL</b>			
Sl. No		TYPE OF TEST	ANNUAL (40 marks)
		TIME PERIOD OF THE TEST	March/April - 2022
	Units	Name of the Topics for ANNUAL	
1	Units-II Algebra	Permutation and combination	04
2	Unit-IV Calculus	a)*Function 4.1,4.2,4.3,4.4	02
3		b) 4.5,4.6,4.7,4.8	04
4	Unit-V Probability	Probability	08
6	Unit-VI Statistics	*Descriptive Statistics	06
7	Unit-VII Basic Financial mathematics	Financial mathematics	11
8	Unit-VIII Co-ordinate Geometry	Coordinate geometry	05
		<b>Total</b>	<b>40</b>
		<b>Assessment</b>	<b>10</b>
		<b>Total</b>	<b>50</b>



## **DETAIL SYLLABUS (THEORY) FOR ANNUAL**

### **UNIT-II ALGEBRA**

Basic concepts of Permutations and Combinations, Permutations, Circular Permutations, Permutations with restrictions, Combinations with standard results

### **UNIT-IV CALCULUS**

Concept of limits and continuity of a function, Instantaneous rates of change  
Differentiation as a process of finding derivative, Derivatives of algebraic functions using Chain rule,

### **UNIT-IV PROBABILITY**

Random experiment, sample space, events, mutually exclusive events, Independent and Dependent Events, Law of Total Probability, Bayes' Theorem

### **UNIT-VII BASICS OF FINANCIAL MATHEMATICS**

Interest and interest rate, Accumulation with simple and compound interest, Simple and compound interest rates with equivalency, Effective rate of interest, Present value, net present value and future value, Annuities, calculating value of regular annuity, Simple applications of regular annuities (up to 3 period), Tax, calculation of tax and simple applications of tax calculation in Goods and service tax, Income Tax, Bills, tariff rates, fixed charge, surcharge, service charge, Calculation and interpretation of electricity bill, water supply bill and other supply bills (Comparing interest rates on various types of savings; calculating income tax; electricity bills, water bill; service surcharge using realistic data)

### **UNIT-VIII COORDINATE GEOMETRY**

Straight Line, Circles, Parabola (only standard forms and graphical representation on two-dimensional plane)

### **\*\* UNIT-IV CALCULUS**

Introducing functions, Domain and Range of a function, Types of functions (Polynomial function; Rational function; Composite function; Logarithm function; Exponential function; Modulus function; Greatest Integer function, Signum function) Graphical representation of functions

### **\*\* UNIT-VI DESCRIPTIVE STATISTICS**

Types of data (raw data, univariate data, bivariate and multi-variate data), Data on various scales (nominal, ordinal, interval and ratio scale), Data representation and visualization, Data interpretation (central tendency, dispersion, deviation, variance, skewness and kurtosis), Percentile rank and quartile rank, Correlation (Pearson and Spearman method of correlation), Applications of descriptive statistics using real time data

### **Practical: Use of spread sheet**

Calculating average, interest (simple and compound), creating pictographs, drawing pie chart, bar graphs, calculating central tendency; visualizing graphs (straight line, circles and parabola using real time data)

### **Suggested practical using spread sheet**

1. Plot the graph of functions on excel; study the nature of function at various points, drawing lines of tangent
2. Create compare sheet of price, features to buy a product;
3. Prepare best option plan to buy a product by comparing cost, shipping charges, tax and other hidden cost;
4. Smart purchasing during sale season;

#### **Assessment Plan**

1. Overall Assessment of the course is out of 50 marks.
2. Assessment plan consists of External Exam and Internal Assessment.
3. External Exam will be of 02 hours duration Paper/Pencil Test consisting of 40 marks.
4. The weightage of the Internal Assessment is 10 marks. It consists of practical work. Teachers can choose activities from the suggested list of practical or they can plan activities of a similar nature. For data-based practical, teachers are encouraged to use data from local sources to make it more relevant for students

<b>Term</b>	<b>Area and Weightage</b>	<b>Assessment Area</b>	<b>Marks allocated</b>
Term II	Project	Project work and record	5
		Term-end Presentation + Viva of the Project	5
		Total	10

## PHYSICS (042)

### PRESCRIBED BOOKS:

1. Physics Part-I, Published by NCERT
2. Physics Part-II, Published by NCERT
3. Exemplar Physics, Published by NCERT
4. Laboratory Manual of Physics, Class XI Published by NCERT
5. Any related books and manuals brought out by NCERT (Also consider multimedia)

### QUESTION SPECIFICATION

**Term I Examinations:** will have Multiple Choice Questions (MCQ) including case-based MCQs and MCQs on assertion-reasoning type.

**Term II Examination/ Year-end Examination:** will have (case-based/ situation based, open ended- short answer/ long answer type) questions.

### COURSE STRUCTURE (THEORY)

#### Class-XI (Term-I)

TIME : 90 Minutes

F.M. : 35

UNITS	NAME OF THE TEST	Term –I
	TIME PERIOD OF THE TEST	NOVEMBER/ DECEMBER- 2021
Unit – I	<b>Physical world and measurement</b>	20
	Chapter 1 : Physical world	
	Chapter 2: Units and Measurement	
Unit– II	<b>Kinematics</b>	
	Chapter 3: Motion in a straight line	
	Chapter 4: Motion in a plane	
Unit -III	<b>Laws of Motion</b>	15
	Chapter 5: Laws of Motion	
Unit –IV	<b>Work, Energy and Power</b>	
	Chapter 6: Work, Energy and Power	
Unit –V	<b>Motion of system of particles and rigid body</b>	
	Chapter 7: Motion of system of particles and rigid body	
Unit –VI	<b>Gravitation</b>	35
	Chapter 8: Gravitation	
	<b>TOTAL</b>	

## SYLLABUS DETAILS

### UNIT – I : PHYSICAL WORLD AND MEASUREMENT

#### Chapter–1: Physical World

Physics-scope and excitement; nature of physical laws; Physics, technology and society. (To be discussed as a part of Introduction and integrated with other topics)

#### Chapter–2: Units and Measurements

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.

### UNIT – II : KINEMATICS

#### Chapter – 3: Motion in a straight line

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).

#### Chapter – 4: Motion in a Plane

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.

### UNIT – III: LAWS OF MOTION

#### Chapter – 5: Laws of Motion

*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. (Recapitulation only)*

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 a banked road).

## **UNIT – IV: WORK, ENERGY AND POWER**

### **Chapter – 6: Work, Energy and Power**

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**

### **Chapter – 7: System of Particles and Rotational motion**

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, law 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).

## **UNIT –VI: GRAVITATION**

### **Chapter – 8: Gravitation**

Universal law of gravitation. Acceleration due to gravity (recapitulation only) and its variation with altitude and depth.

Gravitational potential energy and gravitational potential, escape velocity, orbital velocity of a satellite, Geo-stationary satellites.

## PRACTICALS

### Syllabus for TERM I

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

Record of at least 4 Experiments, to be performed by the students

Record of at least 3 Activities, to be demonstrated by teacher.

## EVALUATION SCHEME

Time Allowed: 1 and 1/2 hrs

Max Marks: 15

Evaluation Scheme for Examination	TERM-I
Two experiments	8 Marks
Practical record (experiment and activities)	2 Marks
Viva on experiments and activities	5 Marks
<b>Total</b>	<b>15 Marks</b>

### Experiments assigned for Term I

1. To measure diameter of a small spherical/cylindrical body and to measure internal diameter and depth of a given beaker/calorimeter using Vernier Calipers and hence find its volume.
2. To measure diameter of a given wire and thickness of a given sheet using screw gauge.

**OR**

To determine volume of an irregular lamina using screw gauge.

3. To determine radius of curvature of a given spherical surface by a spherometer.
4. To determine the mass of two different objects using a beam balance.
5. To find the weight of a given body using parallelogram law of vectors.
6. Using a simple pendulum, plot its  $L-T^2$  graph and use it to find the effective length of second's pendulum.

**OR**

To study variation of time period of a simple pendulum of a given length by taking bobs of same size but different masses and interpret the result.

7. 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.

**OR**

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 assigned for Term I**

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.

**CLASS-XI (ANNUAL EXAMINATION)**

**Time: 2 hours**

**F. M.:35**

Unit	NAME OF THE TEST	Annual
	TIME PERIOD OF THE TEST	MARCH / APRIL
<b>Unit-VII</b>	<b>Properties of Bulk Matter</b>	<b>18</b>
	Chapter-9: Mechanical Properties of Solids	
	Chapter-10: Mechanical Properties of Fluids	
	Chapter-11: Thermal Properties of Matter	
<b>Unit-VIII</b>	<b>Thermodynamics</b>	
	Chapter-12: Thermo dynamics	
	<b>Behavior of Perfect Gases and Kinetic Theory of Gases</b>	
	Chapter-13: Kinetic Theory	

<b>Unit-X</b>	<b>Oscillations and Waves</b>	
	Chapter-14:Oscillations	<b>10</b>
	Chapter-15:Waves	
	Elementary concepts of differentiation and integration with example	<b>05</b>
*	Unit vector ; resolution of a vector in a plane, Scalar and	
	Conservative and non-conservative forces	<b>02</b>
*	Equilibrium of rigid bodies	
	<b>Total</b>	<b>35</b>

## UNIT -VII : PROPERTIES OF BULK MATTER

### Chapter – 9 : Mechanical Properties of Solids

Stress-strain relationship, Hooke's law, Young's modulus, bulk modulus

### Chapter – 10: Mechanical Properties of Fluid

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.

### Chapter – 11: Thermal Properties of Matter

*Heat, temperature, (recapitulation only)* 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 (recapitulation only), thermal conductivity, qualitative ideas of Blackbody radiation, Wein's displacement Law, Stefan's law, Greenhouse effect.

## UNIT -VIII: THERMODYNAMICS

### Chapter – 12: Thermodynamics

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.

## **UNIT –IX: BEHAVIOR OF PERFECT GASES AND KINETIC THEORY OF GASES**

### **Chapter – 13: Kinetic Theory**

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**

### **Chapter – 14: Oscillation**

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 loaded 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.

### **Chapter – 15: Waves.**

Wave motion: Transverse and longitudinal waves, speed of travelling wave, displacement relation for a progressive wave, principle of superposition of waves, reflection of waves, standing waves in strings and organ pipes, Beats

## **PRACTICALS( TERM-II)**

### **Syllabus for TERM II**

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

Record of at least 4 Experiments, to be performed by the students

Record of at least 3 Activities, to be demonstrated by teacher.

## EVALUATION SCHEME

Time Allowed: 1 and 1/2 hrs

Max Marks: 15

Evaluation Scheme for Examination	TERM-I
Two experiments	8 Marks
Practical record (experiment and activities)	2 Marks
Viva on experiments and activities	5 Marks
<b>Total</b>	<b>15 Marks</b>

### Experiments assigned for Term II

1. To determine Young's modulus of elasticity of the material of a given wire.

**OR**

To find the force constant of a helical spring by plotting a graph between load and extension.

2. 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.

3. To determine the surface tension of water by capillary rise method.

**OR**

To determine the coefficient of viscosity of a given viscous liquid by measuring terminal velocity of a given spherical body.

4. To study the relationship between the temperature of a hot body and time by plotting a cooling curve.

5. To determine specific heat capacity of a given solid by method of mixtures.

6. 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.

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

### **Activities assigned for Term II**

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 metre scale loaded at (i) its end (ii) in the middle.
7. To observe the decrease in pressure with increase in velocity of a fluid.

## CHEMISTRY (043)

### PRESCRIBED BOOKS:

1. Chemistry Part-I, Published by NCERT
2. Chemistry Part-II, Published by NCERT
3. Exemplar Chemistry, Published by NCERT
4. Laboratory Manual of Chemistry, Class XI Published by NCERT
5. Any related books and manuals brought out by NCERT (Also consider multimedia)

### QUESTION SPECIFICATION

- **TERM-I:** will have Multiple Choice Questions (MCQ) including case-based MCQs and MCQs on assertion-reasoning type.
- **TERM-II:** will have questions of different formats (case-based situation based, open ended- short answer/ long answer type).

### COURSE STRUCTURE (THEORY) TERM-I

Time : 90 minutes

F.M:35

Sl. No.	UNIT	TYPE OF TEST	TERM-I
		TIME PERIOD OF THE TEST	NOVEMBER-DECEMBER 2021
		NAME OF THE CHAPTER	
1	Unit – I	Some Basic Concepts of Chemistry	11
2	Unit – II	Structure of Atom	
3	Unit –III	Classification of Elements and Periodicity in Properties	4
4	Unit –IV	Chemical Bonding and Molecular Structure	6
5	Unit -VIII	Redox Reactions	5
6	Unit –IX	Hydrogen	
7	Unit –XII	Organic Chemistry: Some basic Principles and Techniques.	9
		<b>Total</b>	<b>35</b>

## **SYLLABUS DETAILS**

### **UNIT I: SOME BASIC CONCEPTS OF CHEMISTRY**

General Introduction: Importance and scope of Chemistry. 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 ATOMS**

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.

### **UNIT III: CLASSIFICATION OF ELEMENTS AND PERIODICITY IN PROPERTIES**

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, electro negativity, valency. Nomenclature of elements with atomic number greater than 100.

### **UNIT IV: CHEMICAL BONDING AND MOLECULAR STRUCTURE**

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.

### **UNIT VIII: REDOX REACTIONS**

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.

### **UNIT IX: HYDROGEN**

Position of hydrogen in periodic table, occurrence, isotopes, hydrides-ionic covalent and interstitial; physical and chemical properties of water, heavy water, hydrogen as a fuel

## UNIT XII: ORGANIC CHEMISTRY -SOME BASIC PRINCIPLES AND TECHNIQUES

General introduction, 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.

### PRACTICALS

EVALUATION SCHEME FOR EXAMINATION	TERM-I
VOLUMETRIC ANALYSIS	8
CONTENT BASED EXPERIMENT	2
CLASS RECORD AND VIVA (INTERNAL EXAMINER)	5
<b>Total</b>	<b>15</b>

### PRACTICAL SYLLABUS

#### TERM-I

Micro-chemical methods are available for several of the practical experiments.

Micro-chemical methods are available for several of the practical experiments, wherever possible

such techniques should be used.

#### 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 of Chemical Substances (2 Marks)

1. Determination of melting point of an organic compound.
2. Determination of boiling point of an organic compound.

#### C. Quantitative Estimation (8 marks)

- i. Using a mechanical balance/electronic 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.

# COURSE STRUCTURE (THEORY) ANNUAL

Time : 2Hrs

F.M:35

Sl. No.	UNIT	TYPE OF TEST	ANNUAL
		TIME PERIOD OF THE TEST	MARCH-APRIL 2022
		NAME OF THE CHAPTER	
1	Unit –V	States of Matter: Gases and Liquids	12
2	Unit –VI	Chemical Thermodynamics	
3	Unit –VII	Equilibrium	
4	Unit -X	s -Block Elements	7
5	Unit -XI	Some p -Block Elements	
6	Unit -XIII	Hydrocarbons	9
*7	Unit -VIII	Redox Reactions	2
*8	Unit –XII	Organic Chemistry: Some basic Principles and Techniques.	5
		<b>Total</b>	<b>35</b>

## SYLLABUS DETAILS

### UNIT V: STATES OF MATTER: GASES AND LIQUIDS

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 and deviation from ideal behaviour.

### UNIT VI: CHEMICAL THERMODYNAMICS

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, 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 nonspontaneous processes.

Third law of thermodynamics (brief introduction).

## **UNIT VII: EQUILIBRIUM**

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, buffer solution, solubility product, common ion effect (with illustrative examples).

## **UNIT X: s-BLOCK ELEMENTS (ALKALI AND ALKALINE EARTH METALS)**

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.

## **UNIT XI: SOME p -BLOCK ELEMENTS**

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.

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.

## **UNIT XIII: HYDROCARBONS**

Classification of Hydrocarbons Aliphatic Hydrocarbons:

Alkanes - Nomenclature, isomerism, conformation (ethane only), physical properties, chemical reactions.

Alkenes - Nomenclature, structure of double bond (ethene), geometrical isomerism, physical properties, methods of preparation, chemical reactions: addition of hydrogen, halogen, water,

hydrogen halides (Markovnikov'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.

### **\*UNIT VIII: REDOX REACTIONS**

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.

### **\*UNIT XII: ORGANIC CHEMISTRY -SOME BASIC PRINCIPLES AND TECHNIQUES**

General introduction, 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.

### **PRACTICALS**

<b>EVALUATION SCHEME FOR EXAMINATION</b>	<b>ANNUAL</b>
SALT ANALYSIS	8
CONTENT BASED EXPERIMENT	2
PROJECT WORK AND VIVA (INTERNAL)	5
<b>Total</b>	<b>15</b>

### **PRACTICAL SYLLABUS**

#### **ANNUAL**

A. Qualitative Analysis (Marks 8)

a. Determination of one anion and one cation in a given salt

Cations-  $\text{Pb}^{2+}$ ,  $\text{Cu}^{2+}$ ,  $\text{As}^{3+}$ ,  $\text{Al}^{3+}$ ,  $\text{Fe}^{3+}$ ,  $\text{Mn}^{2+}$ ,  $\text{Ni}^{2+}$ ,  $\text{Zn}^{2+}$ ,  $\text{Co}^{2+}$ ,  $\text{Ca}^{2+}$ ,  $\text{Sr}^{2+}$ ,  $\text{Ba}^{2+}$ ,  $\text{Mg}^{2+}$ ,  $\text{NH}_4^+$

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

(Note: Insoluble salts excluded)

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

B. Crystallization of impure sample of any one of the following: Alum, Copper Sulphate, Benzoic Acid. (Marks 2)

#### **PROJECT**

Scientific investigations involving laboratory testing and collecting information from other sources.

### A few suggested Projects

- Checking the bacterial contamination in drinking water by testing sulphide ion.
- Study of the methods of purification of water.
- Testing the hardness, presence of Iron, Fluoride, Chloride, etc., depending upon the regional variation in drinking water and study of causes of presence of these ions above permissible limit (if any).
- Investigation of the foaming capacity of different washing soaps and the effect of addition of Sodium Carbonate on it.
- Study the acidity of different samples of tea leaves.
- Determination of the rate of evaporation of different liquids.
- Study the effect of acids and bases on the tensile strength of fibers.
- Study of acidity of fruit and vegetable juices.

Note: Any other investigatory project, which involves about 10 periods of work, can be chosen with the approval of the teacher.

## BIOLOGY (Code No. 044)

### PRESCRIBED BOOKS:

1. TEXT BOOK OF BIOLOGY FOR CLASS-XI (NCERT).
2. EXEMPLAR BIOLOGY-CLASS-XI (NCERT).
3. BIOLOGY SUPPLEMENTARY MATERIAL (REVISED), AVAILABLE ON CBSE WEBSITE.
4. OTHER RELATED BOOKS AND MANUALS BROUGHT OUT BY NCERT (INCLUDING MULTIMEDIA).

### QUESTION SPECIFICATIONS

- **TERM-I:** will have case-based MCQs and MCQs on assertion-reasoning type.
- **TERM-II:** will have questions of different formats (case-based/ situation based, open ended- short answer/ long answer type).

### COURSE STRUCTURE (THEORY) TERM-I

Time: 90 Minutes

Max Marks: 35

UNIT	Type of Test	Term I
	Time period of the test	Nov/Dec 2021 (As per CBSE)
	Name of the Unit	
1	Diversity of Living Organisms	15
2	Structural Organisation in Plants and Animals	08
3	Cell: Structure and Function	12
	<b>Total</b>	<b>35</b>

All questions are compulsory.

Section- 'A' is having 4 Case based questions (Each case based question has 5 MCQs of one mark each).

Section –‘B’ is having 15 Assertion and Reason type questions of one mark each.

Competencies	
Demonstrate Knowledge and Understanding	50%
Application of Knowledge / Concepts	30%
Formulate, Analyse, Evaluate and Create	20%
Total	100%

## THEORY

### Term – I

#### **UNIT-I DIVERSITY OF LIVING ORGANISMS**

##### **Chapter-1: The Living World**

What is living? Biodiversity; Need for classification; three domains of life; concept of species and taxonomical hierarchy; binomial nomenclature.

##### **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 and Gymnospermae. (Salient and distinguishing features and a few examples of each category).

##### **Chapter-4: Animal Kingdom**

Salient features and classification of animals, non-chordates up to phyla level and chordates up to class level (salient features and distinguishing features of a few examples of each category). (No live animals or specimen should be displayed.)

#### **UNIT-II STRUCTURAL ORGANIZATION IN ANIMALS AND PLANTS**

##### **Chapter-5: Morphology of Flowering Plants**

Morphology of inflorescence and flower, Description of 01 family: Solanaceae or Liliaceae (to be dealt along with the relevant experiments of the Practical Syllabus).

##### **Chapter-7: Structural Organization in Animals**

Animal tissues.

## **UNIT-III 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 (ultra structure and function); nucleus.

### **Chapter-9: Biomolecules**

Chemical constituents of living cells: biomolecules, structure and function of proteins, carbohydrates, lipids, nucleic acids; Enzymes- types, properties, enzyme action.

### **PRACTICALS**

**Max. Marks: 15**

<b>Evaluation Scheme</b>		
	<b>TERM-I</b>	<b>MARKS</b>
<b>Part A</b>		
One Major Experiment	Experiment No. - 1	4
One Minor Experiment	Experiment No. - 2	3
<b>Part B</b>		
Spotting(3 Spots of 1 mark each)	B.1, 2, 3	3
Practical Record + Investigatory Project& Record + Viva Voce		5
Total		15

### **TERM -I:**

#### **A: List of Experiments**

A1. Study and describe a locally available common flowering plant, from any one family: Solanaceae or Liliaceae (Poaceae, Asteraceae or Brassicaceae can be substituted in case of particular geographical location) including dissection and display of floral whorls, anther and ovary to show number of chambers (floral formulae and floral diagrams).

A2. Study of osmosis by Potato osmometer.

## **B. Study/Observation of the following List of(spotting):**

B.1 Parts of a compound microscope.

B.2 Specimens/slides/models and identification with reasons - Bacteria, Oscillatoria, Spirogyra, Rhizopus, mushroom, yeast, liverwort, moss, fern, pine, one monocotyledonous plant, one dicotyledonous plant and one lichen.

B.3 Virtual specimens/slides/models and identifying features of - Amoeba, Hydra, liverfluke, Ascaris, leech, earthworm, prawn, silkworm, honeybee, snail, starfish, shark, rohu, frog, lizard, pigeon and rabbit.

## **ANNUAL QUESTION SPECIFICATIONS**

**All questions are compulsory. However, an internal choice of approximately 33% are provided.**

**Section- ‘A’** is having 2 case based questions (Each question with 5 MCQs of one mark each).

**Section B** is having Short/Long type questions: SA( 2 marks)-two questions, LA-I (3 marks)-two questions and LA II (5 marks)-one question.

**Section ‘C’** is having 2 situation based questions (Each question with 5 MCQs of 1 mark each).

Internal Choice is provided in one of the MCQs of any one Case based question under Section A, 1 question of section SA I, One question of LA I and 1 question of LA II under section ‘B’, and one of the MCQs of any one Situation based question under Section C’.

<b>Competencies</b>	
<b>Demonstrate Knowledge and Understanding</b>	<b>50%</b>
<b>Application of Knowledge / Concepts</b>	<b>30%</b>
<b>Formulate, Analyse, Evaluate and Create</b>	<b>20%</b>
<b>Total</b>	<b>100%</b>

**COURSE STRUCTURE (THEORY)  
ANNUAL EXAMINATION 2021-22**

**Time: 2 Hours**

**Max Marks:35**

<b>Theory</b>	<b>EVALUATION SCHEME</b>	
<b>Unit</b>		<b>Marks</b>
II	*Structural Organisation in Animals (Animal Tissues only ) : Chapter 7	2
III	* Cell : The Unit of Life – Chapter 8	5
	*Biomolecules – Chapter 9	4
	Cell : Structure and Function Chapter : 10	9
IV	Plant Physiology : Chapter 13, 14 and 15	9
V	Human Physiology : Chapter 17, 18, 19, 20, 21 and 22	15
	<b>Total</b>	<b>35</b>

\* Topics from Term 1

**ANNUAL (THEORY)**

**Unit-III Cell: Structure and Function**

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

Cell cycle, mitosis, meiosis and their significance

**Unit-IV Plant Physiology**

**Chapter-13: Photosynthesis in Higher Plants**

Photosynthesis as a means 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; C<sub>3</sub> and C<sub>4</sub> pathways; factors affecting photosynthesis.

**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**

Growth regulators - auxin, gibberellin, cytokinin, ethylene, ABA.

## **Unit-V Human Physiology**

### **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.

### **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 - uremia, renal failure, renal calculi, nephritis; dialysis and artificial kidney, kidney transplant.

### **Chapter-20: Locomotion and Movement**

Skeletal muscle, contractile proteins and muscle contraction.

### **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.

### **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, goitre, exophthalmic goitre, diabetes, Addison's disease.

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



## PRACTICALS

**Max. Marks: 15**

<b>Evaluation Scheme</b>		
	TERM - II	MARKS
<b>Part A</b>		
One Major Experiment	Experiment No. -1, 2	4
One Minor Experiment	Experiment No. – 3, 4, 5	3
<b>Part B</b>		
Spotting(3 Spots of 1 mark each)	B.1, 2	3
Practical Record + Investigatory Project& Record + Viva Voce		5
<b>Total</b>		<b>15</b>

Practicals should be conducted alongside the concepts taught in theory classes.

### TERM -II:

#### **A: List of Experiments**

- A1. Separation of plant pigments through paper chromatography.
- A2. Study of distribution of stomata in the upper and lower surfaces of leaves.
- A3. Study of the rate of respiration in flower buds/leaf tissue and germinating seeds.
- A4. Test for presence of sugar in urine.
- A5. Test for presence of albumin in urine.

#### **B. Study/Observation of the following List of(spotting):**

B.1 Tissues and diversity in shape and size of animal cells (squamous epithelium, smooth, skeletal and cardiac muscle fibers and mammalian blood smear) through temporary/permanent slides.

B.2 Mitosis in onion root tip cells and animal cells (grasshopper) from permanent slides.

## COMPUTER SCIENCE (083)

### PRESCRIBED BOOK:

Computer Science with Python (Dhanpat Rai Publication by Sumita Arora)

### QUESTION PAPER

- TERM-I:** will have Multiple Choice Questions (MCQ) including case-based MCQs and MCQs on assertion-reasoning type.
- TERM-II:** will have questions of different formats (case-based/ situation based, open ended- short answer/ long answer type).

### COURSE STRUCTURE (THEORY) TERM-I

Time : 90 minutes

F.M:35

NAME OF THE TESTS&MARK DISTRIBUTION		
TIME PERIOD OF THE TEST		TERM-I
UNIT	NAME OF THE UNIT	NOVEMBER-DECEMBER 2021
1	<b>Computer Systems and Organisation (CSO)</b>	
	Basic computer organisation	1
	Memory Units	1
	Boolean logic	2
	Number System	2
	Types of software:	1
	Concept of Compiler and Interpreter	1
	Operating System	1
	Encoding Schemes	1
2	<b>Computational Thinking and Programming-1</b>	

Introduction to Problem Solving	2
Decomposition	
Familiarization with the basics of Python programming	2
Features of Python, Comments, Introduce the notion of a variable	3
Knowledge of datatypes and operators, Operators & types, Execution of a program	4
Conditional statements	4
Iterative statements:	5
String Manipulations	5
<b>TOTAL</b>	<b>35</b>

## SYLLABUS DETAILS

### TERM-1:

#### **UNIT 1: Computer Systems and Organisation (10 Theory+10 Practical)**

- Basic Computer Organisation:
- Introduction to computer system, hardware, software, input device, output device, CPU, memory (primary, cache and secondary), units of memory (Bit, Byte, KB, MB, GB, TB, PB)
- Types of software: system software (operating systems, system utilities, device drivers), programming tools and language translators (assembler, compiler & interpreter), application software
- Operating system (OS): functions of operating system, OS user interface
- Boolean logic: NOT, AND, OR, NAND, NOR, XOR, truth table, De Morgan's laws and logic circuits
- Number system: Binary, Octal, Decimal and Hexadecimal number system; conversion between number systems.
- Encoding schemes: ASCII, ISCII and UNICODE (UTF8, UTF32)

## UNIT 2 :Computational Thinking and Programming – 1(80 Theory+60 Practical)

- Introduction to problem solving: Steps for problem solving (analysing the problem, developing an algorithm, coding, testing and debugging). representation of algorithms using flow chart and pseudo code, decomposition
- Familiarization with the basics of Python programming: Introduction to Python, features of Python, executing a simple "hello world" program, execution modes: interactive mode and script mode, Python character set, Python tokens (keyword, identifier, literal, operator, punctuator), variables, concept of l-value and r-value, use of comments
- Knowledge of data types: number (integer, floating point, complex), boolean, sequence (string, list, tuple), none, mapping (dictionary), mutable and immutable data types
- Operators: arithmetic operators, relational operators, logical operators, assignment operator, augmented assignment operators, identity operators (is, is not), membership operators (in, not in)
- Expressions, statement, type conversion & input/output: precedence of operators, expression, evaluation of expression, python statement, type conversion (explicit & implicit conversion), accepting data as input from the console and displaying output
- Errors: syntax errors, logical errors, runtime errors
- Flow of control: introduction, use of indentation, sequential flow, conditional and iterative flow control
- Conditional statements: if, if-else, if-elif-else, flowcharts, simple programs: e.g.: absolute value, sort 3 numbers and divisibility of a number
- Iterative statements: for loop, range function, while loop, flowcharts, break and continue statements, nested loops, suggested programs: generating pattern, summation of series, finding the factorial of a positive number etc.
- Strings: introduction, indexing, string operations (concatenation, repetition, membership & slicing), traversing a string using loops, built-in functions: len(), capitalize(), title(), lower(), upper(), count(), find(), index(), endswith(), startswith(), isalnum(), isalpha(), isdigit(), islower(), isupper(), isspace(), lstrip(), rstrip(), strip(), replace(), join(), partition(), split()

## PRACTICAL

S.No	EVALUATION SCHEME FOR EXAMINATION	Marks(Total=30)	TERM- I (15Marks)
1.	Python program	12	6
2.	Reportfile:Minimum20Pythonprograms Term- 1 : Minimum 10 programs based on Term – 1syllabus	7	4
	Viva voce	3	2
3.	Project + Viva voce Term – 1 : Synopsis of the project to be submitted by the students (documentation only)	8	3

## PRACTICAL SYLLABUS

### TERM-1

Input a welcome message and display it.

- Input two numbers and display the larger/smaller number.
- Input three numbers and display the largest/smallest number.
- Generate the following patterns using nested loop.

Pattern-1	Pattern-2	Pattern-3
*	12345	A
**	12 3 4	AB
***	123	ABC
****	12	ABCD
*****	1	ABCDE

- Write a program to input the value of x and n and print the sum of the following series:

o  $1+x+x^2+x^3+x^4+\dots+x^n$

o  $1-x+x^2-x^3+x^4 \dots x^n$

o  $x-x^2+x^3-x^4+\dots x^n$

o  $2\ 3\ 4 \dots n$

o  $x+x^2-x^3+x^4 \dots x^n$

o  $2!\ 3!\ 4! \dots n!$

## COURSE STRUCTURE (THEORY) ANNUAL

NAME OF THE TESTS& MARK DISTRIBUTION		ANNUAL
TIME PERIOD OF THE TEST		MARCH-APRIL-2022
UNIT	NAME OF THE UNIT	
<b>2</b>	Introduction to Python modules (math module, random module, statistics module)	4
	List	6
	Tuples	5
	Dictionaries	5
<b>3</b>	<b>Society, Law and Ethics (SLE-1)</b>	
	Digital Footprints	1
	Digital society and Netizen	1
	Cyber-crime	2
	Safely accessing web sites	1
	E-waste management	1
	Indian Information Technology Act (IT Act)	1
	Technology & Society	1
*	Conditional statements	2
*	Iterative statements:	2
*	String Manipulations	3
<b>TOTAL</b>		<b>35</b>
<b>After completion of Term-1 contents teachers may proceed with Annual contents to overcome shortage of timing for course completion .</b>		

## SYLLABUS DETAILS

### ANNUAL:

#### **Unit II :Computational Thinking and Programming–1**

- Lists: introduction, indexing, list operations (concatenation, repetition, membership & slicing), traversing a list using loops, built-in functions: len(), list(), append(), extend(), insert(), count(), index(), remove(), pop(), reverse(), sort(), sorted(), min(), max(), sum(); nested lists, suggested programs: finding the maximum, minimum, mean of numeric values stored in a list; linear search on list of numbers and counting the frequency of elements in a list
- Tuples: introduction, indexing, tuple operations (concatenation, repetition, membership & slicing), built-in functions: len(), tuple(), count(), index(), sorted(), min(), max(), sum(); tuple assignment, nested tuple, suggested programs: finding the minimum, maximum, mean of values stored in a tuple; linear search on a tuple of numbers, counting the frequency of elements in a tuple
- Dictionary: introduction, accessing items in a dictionary using keys, mutability of dictionary (adding a new item, modifying an existing item), traversing a dictionary, built-in functions: len(), dict(), keys(), values(), items(), get(), update(), del(), clear(), fromkeys(), copy(), pop(), popitem(), setdefault(), max(), min(), count(), sorted(), copy(); suggested programs : count the number of times a character appears in a given string using a dictionary, create a dictionary with names of employees, their salary and access them
- Introduction to Python modules: Importing module using 'import <module>' and using from statement, Importing math module (pi, e, sqrt, ceil, floor, pow, fabs, sin, cos, tan); random module (random, randint, randrange), statistics module (mean, median, mode).

#### **UNIT 3 :Society, Law and Ethics (20 Theory)**

- Digital Footprints
- Digital society and Netizen: net etiquettes, communication etiquettes, social media etiquettes
- Data protection: Intellectual Property Right (copyright, patent, trademark), violation of IPR
- (plagiarism, copyright infringement, trademark infringement), open source softwares and licensing (Creative Commons, GPL and Apache)
- Cyber-crime: definition, hacking, eavesdropping, phishing and fraud emails, ransomware,
- preventing cyber crime

- Cyber safety: safely browsing the web, identity protection, confidentiality, cyber trolls and bullying.
- Safely accessing web sites: malware, viruses, trojans, adware
- E-waste management: proper disposal of used electronic gadgets Indian Information Technology Act (IT Act)
- Technology & Society: Gender and disability issues while teaching and using computers.

**\*UNIT-2:**

\*Conditional statements: if, if-else, if-elif-else, flowcharts, simple programs: e.g.: absolute value, sort 3 numbers and divisibility of a number

\*Iterative statements: for loop, range function, while loop, flowcharts, break and continue statements, nested loops, suggested programs: generating pattern, summation of series, finding the factorial of a positive number etc

\*Strings: introduction, indexing, string operations (concatenation, repetition, membership & slicing), traversing a string using loops, built-in functions: len(), capitalize(), title(), lower(), upper(), count(), find(), index(), endswith(), startswith(), isalnum(), isalpha(), isdigit(), islower(), isupper(), isspace(), lstrip(), rstrip(), strip(), replace(), join(), partition(), split()

**PRACTICAL**

<b>S.No</b>	<b>EVALUATION SCHEME FOR EXAMINATION</b>	<b>Marks (Total=30)</b>	<b>ANNUAL (15Marks)</b>
1.	Python program	12	6
2.	Report file : Minimum 20 Python programs Annual : Minimum 10 programs based on Annual syllabus	7	3
	Viva voce	3	1
3.	Project + Viva voce  Annual : Final coding + Viva voce (Student will be allowed to modify their Term 1 document and submit the final executable code.)	8	5



## PRACTICAL SYLLABUS

### ANNUAL

- Find the largest / smallest number in a list/tuple
- Input a list of numbers and swap elements at the even location with the elements at the odd location.
- Input a list / tuple of elements, search for a given element in the list/tuple.
- Input a list of numbers and find the smallest and largest number from the list.
- Create a dictionary with the roll number, name and marks of n students in a class and display the names of students who have scored marks above 75.

### Suggested Reading Material

- NCERT Textbook for COMPUTER SCIENCE (ClassXI)
  - Support Materials on the CBSE website.
-

## ECONOMICS (030)

### PRESCRIBED BOOKS:

1. Statistics for Economics, Published by NCERT
2. Introductory Micro Economics, Published by NCERT

### QUESTION SPECIFICATIONS

- **TERM-I:** will have Multiple Choice Questions (MCQ) including case-based MCQs and MCQs on assertion-reasoning type.
- **TERM-II:** will have questions of different formats (case-based/ situation based, open ended- short answer/ long answer type).

### COURSE STRUCTURE(THEORY) TERM-I

Time : 90 minutes

F.M:40

Sl. No.	UNIT	TYPE OF TEST	TERM-I
		TIME PERIOD OF THE TEST	NOVEMBER-DECEMBER 2021
		NAME OF THE CHAPTER	
1	Unit – I	Introduction	<b>04</b>
2	Unit –II	Collection of Data	
		Organisation of Data	
		Presentation of Data	
3	Unit –III	Measures of Central Tendency	<b>10</b>
4	Unit –IV	Introduction	<b>4</b>
5	Unit –V	Consumer Behaviour & Demand	<b>13</b>
		<b>Total</b>	<b>40</b>

### SYLLABUS DETAILS

#### UNIT I: INTRODUCTION

What is Economics?

Meaning, scope, functions and importance of statistics in Economics

## **UNIT II: COLLECTION, ORGANISATION AND PRESENTATION OF DATA**

**Collection of data** - sources of data - primary and secondary; how basic data is collected with concepts of Sampling; methods of collecting data; some important sources of secondary data: Census of India and National Sample Survey Organisation.

**Organization of Data:** Meaning and types of variables; Frequency Distribution.

**Presentation of Data:** Tabular Presentation and Diagrammatic Presentation of Data: (i) Geometric forms (bar diagrams and pie diagrams), (ii) Frequency diagrams (histogram, polygon and O gives) and (iii) Arithmetic line graphs (time series graph).

## **UNIT III: STATISTICAL TOOLS AND INTERPRETATION**

For all the numerical problems and solutions, the appropriate economic interpretation may be attempted. This means, the students need to solve the problems and provide interpretation for the results derived.

**Measures of Central Tendency-** Arithmetic mean, median and mode

## **UNIT VI: INTRODUCTION**

Meaning of microeconomics and macroeconomics; positive and normative economics  
What is an economy? Central problems of an economy: what, how and for whom to produce; concepts of production possibility frontier and opportunity cost.

## **UNIT V: CONSUMER'S EQUILIBRIUM AND DEMAND**

Consumer's equilibrium - meaning of utility, marginal utility, law of diminishing marginal utility, conditions of consumer's equilibrium using marginal utility analysis.

Indifference curve analysis of consumer's equilibrium-the consumer's budget (budget set and budget line), preferences of the consumer (indifference curve, indifference map) and conditions of consumer's equilibrium.

Demand, market demand, determinants of demand, demand schedule, demand curve and its slope, movement along and shifts in the demand curve; price elasticity of demand - factors affecting price elasticity of demand; measurement of price elasticity of demand – percentage-change method.

## **PRACTICAL SYLLABUS**

### **TERM-1**

Part C Project Work (Part 1): 10 Marks

Students would prepare only ONE project in the entire academic session, which is divided into 2 terms i.e. Term I and Term II.

## COURSE STRUCTURE (THEORY) ANNUAL

Time : 2hrs

F.M:40

Sl. No.	UNIT	TYPE OF TEST	TERM-II
		TIME PERIOD OF THE TEST	MARCH-APRIL 2022
		NAME OF THE CHAPTER	
1	Unit –III	Measures of Dispersion	<b>17</b>
		Co-relation	
		Index Number	
2	Unit –VI	Introduction	<b>3</b>
3	Unit -V	Consumer Behaviour & Demand	<b>3</b>
4	Unit -VI	Production Function	<b>10</b>
		Cost	
		Revenue	
		Theory of Supply	
5	Unit -VII	Forms of Market and Price Determination under perfect competition with simple applications	<b>7</b>
		<b>Total</b>	<b>40</b>

### SYLLABUS DETAILS

#### UNIT III: STATISTICAL TOOLS AND INTERPRETATION

**Measures of Dispersion** - absolute dispersion (range, quartile deviation, mean deviation and standard deviation); relative dispersion (co-efficient of range, co-efficient of quartile-deviation, co-efficient of mean deviation, co-efficient of variation)

**Correlation** – meaning and properties, scatter diagram; Measures of correlation - Karl Pearson's method (two variables ungrouped data) Spearman's rank correlation.

**Introduction to Index Numbers** - meaning, types - wholesale price index, consumer price index and index of industrial production, uses of index numbers; Inflation and index numbers.

#### UNIT VI: INTRODUCTION

Meaning of microeconomics and macroeconomics; positive and normative economics. What is an economy? Central problems of an economy: what, how and for whom to produce; concepts of production possibility frontier and opportunity cost.

## UNIT V: CONSUMER'S EQUILIBRIUM AND DEMAND

Demand, market demand, determinants of demand, demand schedule, demand curve and its slope, movement along and shifts in the demand curve; price elasticity of demand - factors affecting price elasticity of demand; measurement of price elasticity of demand – percentage-change method.

## UNIT VI: PRODUCER BEHAVIOUR AND SUPPLY

Meaning of Production Function – Short-Run and Long-Run. Total Product, Average Product and Marginal Product.

Returns to a Factor: Law of Variable Proportions.

Cost: Short run costs - total cost, total fixed cost, total variable cost; average cost; average fixed cost, average variable cost and marginal cost-meaning and their relationships.

Revenue - total, average and marginal revenue - meaning and their relationship.

Supply, market supply, determinants of supply, supply schedule, supply curve and its slope, movements along and shifts in supply curve, price elasticity of supply; measurement of price elasticity of supply - percentage-change method.

## UNIT VII: FORMS OF MARKET AND PRICE DETERMINATION UNDER PERFECT COMPETITION WITH SIMPLE APPLICATIONS.

Perfect competition - Features; Determination of market equilibrium and effects of shifts in demand and supply.

Other Market Forms - monopoly, monopolistic competition - their meaning and features.

Simple Applications of Demand and Supply: Price ceiling, price floor.

## PRACTICAL SYLLABUS

### TERM-II

#### Guidelines for Project Work in Economics (Class XI)

The **objectives** of the project work are to enable learners to:

- probe deeper into theoretical concepts learnt in classes XI
- analyse and evaluate real world economic scenarios using theoretical constructs and arguments
- demonstrate the learning of economic theory
- follow up aspects of economics in which learners have interest
- develop the communication skills to argue logically
- The **expectations** of the project work are that:
- learners will complete only **ONE** project in each academic session

- project should be of 3,500-4,000 words (excluding diagrams & graphs), preferably hand-written
- it will be an independent, self-directed piece of study

### **Scope of the project:**

Learners may work upon the following lines as a suggested flow chart:

Choose a title/topic

- Collection of the research material/data
- Organization of material/data
- Present material/data
- Analysing the material/data for conclusion
- Draw the relevant conclusion
- Presentation of the Project Work

### **Expected Checklist:**

- Introduction of topic/title
- Identifying the causes, consequences and/or remedies
- Various stakeholders and effect on each of them
- Advantages and disadvantages of situations or issues identified
- Short-term and long-term implications of economic strategies suggested in the course of research
- Validity, reliability, appropriateness and relevance of data used for research work and for presentation in the project file
- Presentation and writing that is succinct and coherent in project file
- *Citation of the materials referred to, in the file in footnotes, resources section, bibliography etc.*

### **Mode of presentation/submission of the Project:**

At the end of the stipulated term, each learner will present the research work in the Project File to the Internal examiner. **The questions should be asked from the Research Work/ Project File of the learner. The Internal Examiner should ensure that the study submitted by the learner is his/her own original work.** In case of any doubt, authenticity should be checked and verified.

### Marking Scheme :

Marks are suggested to be given as –

S. No.	Heading	Marks Allotted
1	Relevance of the topic	3
2	Knowledge Content/Research Work	6
3	Presentation Technique	3
4	Viva-voce	8
	<b>Total</b>	20 Marks

### Suggestive List of Projects:

- Effect on PPC due to various government policies
- Opportunity Cost as an Economic Tool (taking real life situations)
- Effect on equilibrium Prices in Local Market (taking real life situation or recent news)
- Solar Energy, a Cost Effective Comparison with Conventional Energy Sources
- Effect of Price Change on a Substitute Good (taking prices from real life visiting local market)
- Effect of Price Change on a Complementary Good (taking prices from real life visiting local market)
- Bumper Production- Boon or Bane for the Farmer
- Solar Energy, a Cost Effective Comparison with Conventional Energy Sources
- Any other newspaper article and its evaluation on basis of economic principles
- **Any other topic**

## PHYSICAL EDUCATION (048)

### PRESCRIBED BOOKS:

1. Health & Physical Education by Dr.V.K.Sharma (Saraswati Publication)

### REFERENCE BOOK :

1. Health & Physical Education by Dr. Kundra, Evergreen Publication

### PRACTICAL RECORD :

1. Evergreen Practical Record Book (Candid)/VIVA Publication.

## QUESTION SPECIFICATION

- **TERM-I:** will have Multiple Choice Questions (MCQ) including case-based MCQs and MCQs on assertion-reasoning type.
- **TERM-II:** will have questions of different formats (case-based/ situation based, open ended- short answer/ long answer type).

## COURSE STRUCTURE (THEORY) TERM-I

Time : 90 minutes

F.M:35

Sl. No.	UNIT	TYPE OF TEST	TERM-I
		TIME PERIOD OF THE TEST	NOVEMBER-DECEMBER 2021
		NAME OF THE CHAPTER	
1	Unit – I	Changing Trends & career in Physical Education	7
2	Unit – II	Olympic Value education	8
3	Unit –III	Physical Fitness Wellness & Lifestyle	7
4	Unit –VII	Test, Measurement & Evaluation	7
5	Unit -VIII	Fundamentals of Anatomy Physiology & Kinesiology in Sports	6
		<b>Total</b>	<b>35</b>



## **SYLLABUS DETAILS**

### **UNIT I: CHANGING TRENDS & CAREER IN PHYSICAL EDUCATION**

- Meaning & definition of Physical Education
- Aims & Objectives of Physical Education
- Career Options in Physical Education
- Khelo-India programme

### **UNIT II: OLYMPIC VALUE EDUCATION**

- Olympics
- Olympic Symbols, Ideals, Objectives & Values of Olympism
- International Olympic Committee Indian Olympic Association

### **UNIT III: PHYSICAL FITNESS WELLNESS & LIFESTYLE**

- Meaning & Importance Of Physical Fitness, Wellness & Lifestyle
- \*Components of Physical Fitness and Wellness
- Components of Health Related Fitness

### **UNIT VII: TEST, MEASUREMENT & EVALUATION**

- Define Test, Measurement & Evaluation
- Importance Of Test, Measurement & Evaluation In Sports
- Calculation Of BMI & Waist - Hip Ratio
- \*Measurement of health-related fitness

### **UNIT VIII: FUNDAMENTALS OF ANATOMY PHYSIOLOGY & KINESIOLOGY IN SPORTS**

- Definition and Importance of Anatomy, Physiology & Kinesiology.
- Function Of Skeleton System
- Classification of Bones & Types of Joints
- \*Function & Structure of Respiratory System and Circulatory System
- Equilibrium- Dynamic & Static and Centre of Gravity and its application in sports

## PRACTICALS

EVALUATION SCHEME FOR EXAMINATION	TERM-I
PROJECT FILE (ABOUT ONE SPORT / GAME OF CHOICE)	5
DEMONSTRATION OF FITNESS ACTIVITY	5
VIVA VOICE (FROM PROJECT FILE; & FITNESS)	5
<b>Total</b>	<b>15</b>

## COURSE STRUCTURE (THEORY) ANNUAL

Time : 2Hrs

F.M:35

Sl. No.	UNIT	TYPE OF TEST	ANNUAL
		TIME PERIOD OF THE TEST	MARCH-APRIL 2022
		NAME OF THE CHAPTER	
1	Unit –IV	Physical Education and Sports for CWSN (Children With Special Needs-Divyang)	7
2	Unit –V	Yoga	5
3	Unit –VI	Physical Activity & Leadership Training	4
4	Unit -IX	Psychology and Sports	6
5	Unit -X	Training and doping in sports	6
6		*Components of Physical Fitness	7
7		*Function of Respiratory System and Circulatory System	
8		*Measurement of health related fitness	
		<b>Total</b>	<b>35</b>

\*Topics from Term –I Syllabus

## **SYLLABUS DETAILS**

### **UNIT IV: PHYSICAL EDUCATION AND SPORTS FOR CWSN (CHILDREN WITH SPECIAL NEEDS-DIVYANG)**

- Aims & objectives of Adaptive Physical Education
- Organization promoting Adaptive Sports (Special Olympics Bharat; Paralympics; Deaf Olympics)
- Role of various professionals for children with special needs (Counselor, Occupational Therapist, Physiotherapist, Physical Education Teacher, Speech Therapist & special Educator)

### **UNIT V: YOGA**

- Meaning & Importance of Yoga
- Elements of Yoga
- Introduction - Asanas, Pranayam, Meditation & Yogic Kriyas
- Yoga for concentration & related Asanas (Sukhasana; Tadasana; Padmasana & Shashankasana, Naukasana, Vrikshasana (Tree pose), Garudasana (Eagle pose))

### **UNIT VI: PHYSICAL ACTIVITY & LEADERSHIP TRAINING**

- Leadership Qualities & Role of a Leader
- Meaning, objectives & types of Adventure Sports (Rock Climbing, Tracking, River Rafting, Mountaineering, Surfing and Paragliding)
- Safety measures to prevent sports injuries

### **UNIT IX: PSYCHOLOGY AND SPORTS**

- Definition & Importance of Psychology in Phy. Edu. & Sports
- Define & Differentiate Between Growth & Development.
- Adolescent Problems & Their Management

### **UNIT X: TRAINING AND DOPING IN SPORTS**

- Meaning & Concept of Sports Training
- Principles of Sports Training
- Concept & classification of doping
- Prohibited Substances & their side effects

## PRACTICALS

<b>EVALUATION SCHEME FOR EXAMINATION</b>	<b>ANNUAL</b>
PROJECT FILE (YOGA AND GENERAL MOTOR FITNESS TEST)	5
DEMONSTRATION OF FITNESS ACTIVITY/YOGA	5
VIVA VOICE (FROM VIVA VOICE (FROM PROJECT FILE; GENERAL MOTOR FITNESS; YOGA)	5
<b>Total</b>	<b>15</b>

## PAINTING (049)

**PRESCRIBED BOOK :** An introduction to Indian Art Part – II (NCERT)

**REFERENCE BOOK :** Panoramic Indian Painting (R.C. Luthera) OR  
History of Indian Art ( Full circle)

### QUESTION SPECIFICATION

- **TERM-I:** will have Multiple Choice Questions (MCQ).
- **TERM-II:** will have questions of different formats (case-based/ situation based, open ended- short answer/ long answer type).

### COURSE STRUCTURE (THEORY) TERM-I

Term	Units		Marks
		<b>History of Indian Art</b>	
<b>I</b>	<b>1</b>	Pre-historic rock paintings and art of Indus valley	<b>8</b>
	<b>2</b>	Buddhist, Jain & Hindu Art	<b>7</b>
<b>II</b>	<b>3</b>	Temple Sculpture	<b>8</b>
	<b>4</b>	Bronzes and artistic aspects of Indo-Islamic architecture	<b>7</b>
			<b>30</b>

### COURSE STRUCTURE (THEORY) TERM-I

Unit	Content	18 Periods
<b>1.</b>	A . Pre-Historic Rock paintings Introduction : (CH-1) 1) Period and location 2) Study and appreciation of following Pre-historic Paintings: (i) Wizard's dance, Bhimbetka	
	B. Art of Indus Valley Introduction (CH-2): 1. Period and location 2. Extension : In about 1500 miles	

	<ul style="list-style-type: none"> <li>• Harappa and Mohenjo-daro (Now in Pakistan)</li> <li>• Ropar, Lothal, Rangpur, Alamgirpur, Kali Bangan, Banawali and Dhola Veera (In India)</li> </ul>	
<b>2</b>	<p>Study and appreciation of following: Sculptures and Terracottas:</p> <p>i. Dancing girl (Mohenjo-Daro), Bronze, 10.5 x 5x2.5, Circa 2500 BC (Collection: National Museum, New Delhi)</p> <p>ii. Male Torso (Harappa), Red Lime Stone, 9.2x5.8x3cms, Circa 2500BC (Collection: National Museum, New Delhi)</p> <p>iii. Mother Goddess (Mohenjo-Daro), Terracotta, 9.2x5.8x3cms, Circa 2500BC (Collection: National Museum, New Delhi)</p>	
<b>3</b>	<p><b>Study and appreciation of following Seal:</b></p> <p>(i) Bull seal (Mohenjo-Daro), Stone (Steatite), 2.5 x 2.5 x 1.4 cm. Circa 2500 B.C. (Collection: National Museum, New Delhi)</p> <p><b>Decoration on Earthen wares :</b></p> <p>(i) Painted earthen-ware (Jar) - (Mohenjo-Daro) (Collection: National Museum, New Delhi)</p>	
<b>Unit 2</b>	<b>Buddhist, Jain &amp; Hindu Art (CH-3) (3rd Century B.C. to 8 Century A.D.)</b>	<b>18 Periods</b>
<b>1</b>	General introduction to Art during Mauryan, Shunga, Kushana (Gandhara and Mathura style) and Gupta Period :	
<b>2</b>	<p><b>Study and appreciation of following Sculptures :</b></p> <p>i. Lion capital from Sarnath (Mauryan Period), Polished Sandstone, Circa 3rd Century B.C. (Collection: Sarnath Museum, U.P.)</p> <p>ii. Chauri Bearer from Didar Ganj (Yakshi) (Mauryan Period), Polished Sandstone, Circa 3rd Century B.C. (Collection: Sarnath Museum, U.P.)</p> <p>iii. Seated Buddha from Katra Mound, Mathura (Kushan period- Mathura Style) Red-spotted Sand Stone, Circa 3rd Century A.D. (Collection: Govt. Museum, Mathura)</p> <p>iv. Jain Tirthankara (Gupta Period) Stone Circa 5th Century A.D. (Collection: State Museum, Lucknow, U.P.)</p>	
<b>3</b>	<p><b>Introduction to Ajanta Location (Art of Ajanta) CH-4</b></p> <p>Period, No. of caves, Chaitya and Vihara, Paintings and Sculptures, Subject-matter and technique etc.</p>	

**Note: There will be a ‘Chapter Ending Test’ after completion of each chapter.**

**(PRACTICAL)  
TERM-I**

**FM : 35 Marks**

**Painting Composition**

**25 Marks**

- (i) Simple exercises of basic design in variation of geometric and rhythmic shapes in geometrical and decorative designs and colours to understand designs as organized visual Arrangements.  
(10 Marks)
- (ii) Sketches from life and nature (15 marks)

**Portfolio Assessment**

**(10marks)**

- a) Record of the Term, performance from sketch to finished product (05 marks)
- b) One selected work of paintings composition done during the Term (03 marks)
- c) Two selected works of paintings done during the Term. (02marks)

**COURSE STRUCTURE (THEORY) TERM-II**

**HISTORY OF INDIAN ART**

<b>Unit 3</b>	<b>Temple sculpture, Bronzes and Artistic aspects of Indo-Islamic architecture</b>	<b>18 Periods</b>
	Artistic aspects of Indian temple sculptures (6th Century to 13th Century A.D.) 1) Introduction to Temple Sculpture (6th Century to 13th Century A.D.) 2) Study and appreciation of following Temple-Sculptures	
	i . Descent of Ganga (Pallava Period, Mahabalipuram, ( Tamil Nadu), Granite Rock Circa 7th Century A.D.	
	ii. Trimurti (Elephanta, Maharashtra) Stone Circa 9th Century A.D.	
	iii. Lakshmi Narayana, Kandariya Mahadev Temple) (Chandela period Stone, Khajuraho, Madhya Pradesh) Stone Circa 10th Century A.D.	
	iv.Cymbal player , Sun Temple (Ganga Dynasty, Konark, Odisha) Circa 13th Century A.D.	
	v.Mother and child ( Vimal Shah Temple, Solanki Dynasty, Dilwara,Mount Abu, Rajasthan) Circa 13th Century A.D.	
<b>Unit</b>	<b>Bronzes and Artistic Aspects of the Indo-Islamic Architecture.</b>	

4	(1) Introduction to Indian Bronzes	
	(2) Method of casting (solid and hollow )	
	(3) Study and appreciation of following South Indian Bronzes	
	i. Nataraj (Chola Period, Thanjavur Dist, Tamil Nadu) 12 <sup>th</sup> Century A.D. Collection National Museum, New Delhi	
	<b>Artistic Aspects of the Indo-Islamic Architecture.</b> (1) Introduction (2) Study and appreciation of following architectures. i. Qutab Minar , Delhi ii. Gol Gumbad of Bijapur	

**PRACTICAL  
TERM – II**

**FM- 35 Marks**

**Nature and Object Study**

**25 Marks**

Study of two or three natural and geometric forms in pencil with light and shade from a fixed point of view. Natural form like plants, vegetables, fruits and flowers etc., are to be used. Geometrical forms of objects like cubes, cones, prisms, cylinders and spheres should be used.

**Portfolio assessment**

**10 Marks**

- |  |         |
|--|---------|
| a) Record of the Term, performance from sketch to finished product   | 5 Marks |
| b) Three selected nature and object study exercise in any media done during session including the minimum of two still life exercises. | 5 Marks |

These selected works prepared during the course by the candidates and certified by the school authorities as the work done in the school will be placed before the examiners for assessment.

**Note:**

1. The candidates should be given one hour – break after first three hours.
2. The time-table to be so framed as to allow the students to work continuously for minimum of two periods at a stretch.



## **FORMAT OF THE QUESTIONS**

### **Part – I : Nature and Object Study**

- Draw and paint the still life from a fixed point of view
- All the art work should be done on the half imperial size
- The objects should be painted in realistic manner with proper light and shade and perspective etc.
- The objects for nature study and object study are to be arranged before the candidates.

### **Part – II : Painting Composition**

- Painting Composition on any of the following five subjects
  1. Affairs of family friends and daily life.
  2. Affairs of family professional
  3. Games and sports activities
  4. Nature and fantasy
  5. National, religious, cultural, historical and social events and celebrations.
- Medium (any one)  
(Water Color, Pastel, Tempera, Acrylic)
- Paper size : Half-imperial size either vertically or horizontally.
- Weightage will be given on well composed drawing, effective use of media and effective composition.