DAV PUBLIC SCHOOL, BERHAMPUR
Syllabus for the Session: 2021-2022-
STD-XII

ENGLISH CORE -301

PRESCRIBED BOOKS:

1. FLAMINGO BY NCERT
2. VISTAS BY NCERT

TYPOLOGY OF QUESTION :

1. Difficult questions - 15%
2. Average questions - 70%
3. Easy questions - 15%

TERM - I (MCQ) (40 + 10 = 50 MARKS)

WEIGHTAGE (IN MARKS)

Reading Comprehension: 8+6 marks = 14 marks

Creative Writing Skills: 3+5 marks = 08 marks

Literature: 11 marks for Flamingo + 7 marks for Vistas =18 marks

[MCQ: Case Based / Situation Based / Assertive/Reasoning Type MCQ Questions]

DETAILED QUESTION PATTERN YET TO BE RELEASED BY CBSE

COURSE STRUCTURE (TERM-I)	
TERM-I **(40 Marks)** **As per CBSE Guidelines**	
SEC	**NOVEMBER / DECEMBER 2021**
A.	**Reading Comprehension:** • Unseen passage (factual, descriptive or literary/discursive or persuasive) • Case Based Unseen Factual) Passage

B.	**Creative Writing Skills:** **<u>Short Writing Tasks</u>** • Notice Writing • Classified Advertisements **Long Writing Tasks (One)** • Letter to an Editor (giving suggestions or opinion on issues of public interest) • Article Writing

C.	**LITERATURE:** Literary-prose/poetry extracts (seen- texts) to assess comprehension and appreciation, analysis, inference, extrapolation **Questions Based on Texts to assess** comprehension and appreciation, analysis, inference, extrapolation **<u>Book-Flamingo (Prose</u>**) • The Last Lesson • Lost Spring • Deep Water **<u>Book-Flamingo (Poetry)</u>** • My Mother at Sixty-Six • An Elementary School Classroom in a Slum • Keeping Quiet **<u>Book-Vistas (Prose)</u>** • The Third Level • The Enemy	
	40	**TOTAL**
	ALS	**10**
	GRAND TOTAL	**40 + 10 = 50 Marks**

<u>TERM-II (40+10 = 50 MARKS)</u>

Reading Comprehension: 8 + 6 marks = 14 marks
Creative Writing Skills: 3 + 5 marks = 08 marks
Literature: 11 marks for Flamingo + 7 marks for Vistas =18 marks

[Case Based / Situation Based / Open Ended / Short Answer/ Long Answer Questions]

DETAILED QUESTION PATTERN YET TO BE RELEASED BY CBSE

	COURSE STRUCTURE (TERM-II)
	TERM-II **40 marks** **As per CBSE Guidelines**
SEC	**MARCH/APRIL- 2022**
A.	**Reading Comprehension**: (Two Passages) • Unseen passage (factual, descriptive or literary/discursive or persuasive) • Case Based Unseen Factual) Passage
B.	**Creative Writing Skills:** **<u>Short Writing Tasks</u>** • Formal & Informal Invitation Cards or the Replies to Invitation/s **<u>Long Writing Tasks (One)</u>** • Letter of Application for a Job • Report Writing

C	**LITERATURE:** Questions based on extracts/texts to assess comprehension and appreciation, analysis, inference, extrapolation **<u>Book-Flamingo (Prose)</u>** • The Rattrap • Indigo **<u>Book-Flamingo (Poetry)</u>** • A Thing of Beauty • Aunt Jennifer's Tigers **<u>Book-Vistas (Prose)</u>** • Should Wizard Hit Mommy? • On the Face of It • Evans Tries an O level	
	TOTAL	40
	ALS	10
	GRAND TOTAL	40 + 10 =50 Marks

Guidelines for Assessment in Listening and Speaking Skills (ALS)

Term I: 10 marks: Assessment of Listening and Speaking Skills

ALS must be seen as an integrated component of all four language skills rather than a compartment of two. Suggested activities, therefore, take into consideration an integration of the four language skills but during assessment, emphasis will be given to speaking and listening, since reading and writing are already being assessed in the written exam.

Listening Skill:

The focus is to use the assessment of Listening Skills for improving learners' competency to listen for basic interpersonal, instructional and academic purposes. A number of sub-skills need to be developed in the everyday classroom transaction. Given below are some of the sub-skills of listening which need to be assessed for the Internal Assessment component of Listening:

i. Listening for Specific Information
ii. Listening for General Understanding
iii. Predictive Listening
iv. Inferential Listening
v. Listening for Pleasure
vi. Intensive Listening
vii. Evaluative Listening

Hence, the assessment items being prepared by subject teachers must assess the above.

Speaking Skill:

Assessment of speaking skills must be made an important component of the overallassessment, using this assessment as learning.

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 ALS :

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 academicyear.
- **The final Term- I ALS to be conducted latest by last week of September.**

TERM II: 10 MARKS – PROJECT WORK + VIVA-VOCE

- Out of ten marks allotted for the term, **5 marks will be allotted for the projectreport/script /essay etc. and 5 for the viva.**
- The Project will be **ONE** small project work to be covered in the **Term II.** However, theplanning for the project by students in consultation with the teachers can begin early.

Schedule:

- Students are expected to adhere to the timeline for the planning, preparation and viva-voce of ASL based projects.

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 formof 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 andspeaking.

SUGGESTED PROJECT WORK

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. Self-made video/ Audio based on a script.

The following elements should be taken into consideration:

- Theme/topic of the audio / video
- Presentation of the script
- Video/audio of an interview
- Duration- Maximum 5 min

Rubrics for Project Viva : (5 Pointers)

1. **Pronunciation**: **(1 mark)**
   - Pronunciation of clearly articulated words ,unusual spellings and intonation.
2. **Vocabulary (1 mark)**
   - Extensive and appropriate **vocabulary** during the viva.

3. **Accuracy**: **(1 mark**)
   - Accuracy of **grammatical structures**.
4. **Communication & Interaction (1 mark)**
   - Creative usage of the language for effective communication.
   - Effective interaction skills to answer questions with relative ease and follow the flow of conversation on the chosen topic.
5. **Fluency**: **(1 mark)**
   - Pronunciation, vocabulary, accuracy & interaction.

Project-Portfolio/ Project Report

The **Project-Portfolios** is a compilation of the work that the students produce during theprocess 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 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.
- Photographs that capture the positive learning experiences of the students.
- List of resources/bibliography.

Rubrics for assessing the project portfolios: (5 Pointers)

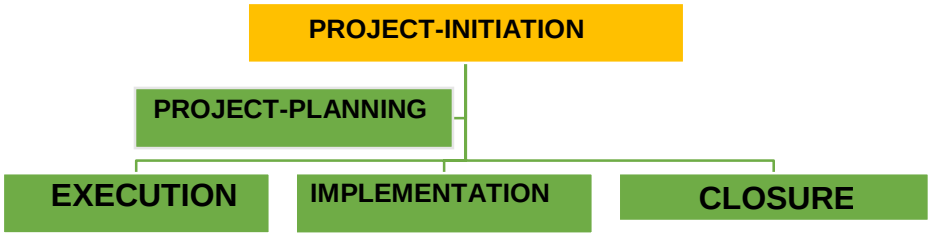
- Quality of content of the project (1 mark)
- Accuracy of information (1 mark)
- Clarity of thoughts , ideas & creativity (1 mark)
- Contributions by group members (1 mark)
- Knowledge and experience gained (1 mark)

N.B.

PROJECT SHOULD BE AN ORIGINAL AND CREATIVE MANUSCRIPT.
SUBMISSION DATE – 2nd week of January
CONDUCT OF VIVA – Last week of January

Timeline

<u>The FIVE Steps in Project Plan</u>



Month	Objectives
Planning and Research for the Project Work **Preferably till November-December**	• Teachers plan a day to orient students about the ALS projects, detailsare shared with all stakeholders. • Students choose a project, select team members and develop project-plan. • Group meets (preferably online) and reports to the team leader aboutthe progress: shortfalls and successes are detailed. • Team leader apprises teacher-mentor. • Students working individually or in pairs also update the teachers. • A logical, deliverable and practical plan is drafted by the team/ pair/individual. Goals/objectives are clearly defined for all. • Work is delegated to team members by the team leader. Studentswishing to work alone develop their own plan of Action. • Detailed project schedules are shared with the teacher.
December-January	• Suggestions and improvements are shared by the teacher, wherevernecessary. • Group members coordinate and keep communication channels openfor interaction**.** • Gaps (if any) are filled with the right skill sets by the Team Leader/individual student.
	• The final draft of the project portfolio/ report is prepared and submittedfor evaluation.
January-February	• Students are assessed on their group/pair/ individual presentations on allotted days. Final Viva is conducted by the External/Internal examiner.
February-March **or** **as per the timelines given by the Board**	• Marks are uploaded on the CBSE website.

MATHEMATICS (041) FOR CLASS – XII

Special Scheme for the session 2021 – 22

1. **Academic session 2021 -22is divided into 2 Terms as TERM – I and TERM – II.**

2. **All questions of Term – I are of Multiple Choice Questions (MCQs) including case-based MCQs and MCQs on assertion – reasoning type. Duration of the test is 90 minutes. The responses of students will be captured on OMR sheets.**

3. **At the end of the second term TERM – II/Year End Examination will be conducted.**

4. **TERM – II Examination will be of 2 hours duration and have questions of different formats as case-based/situation based, open ended - short answer/long answer type.**

5. **In case the situation is not conducive for normal descriptive examination a 90 minutes MCQ based exam will be conducted at the end of the TERM – II also.**

6. **The chapters of TERM – I will not be asked in TERM – II Examination.**

PRESCRIBED BOOKS :

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

COURSE STRUCTURES

Class XII(2021-22)

Sl. No.		TYPE OF TEST→	TERM - I (40 marks)		TYPE OF TEST→	TERM – II (40 marks)
		TIME PERIOD OF THE TEST →	November/ December - 2021		TIME PERIOD OF THE TEST →	March/April - 2022
	Units for TERM - I	Name of the Topics for Term - I	Unit wise Marks Distribution	Units for TERM - II	Name of the Topics for Term - II	Unit wise Marks Distribution
1	I Relations and Functions	Relations and Functions	8	III Calculus	Integrals	18
2		Inverse Trigonometric Functions			Application of Integrals	
3	II	Matrices			Differential	

	Algebra		10		Equations	
4		Determinants		IV Vectors and Three – Dimensional Geometry	Vectors	14
5	III Calculus	Continuity and Differentiability	17		Three – Dimensional Geometry	
6		Application of Derivatives		VI Probability	Probability	8
7	V Linear Programming	Linear Programming	5			
		TOTAL	40			40
		Internal Assessment	10			10
		TOTAL	50			50

- **No chapter wise weightage for Term – I and Term – II**

SYLLABUS DETAILS FOR TERM - I

Unit-I: Relations and Functions

1. Relations and Functions

Types of relations: reflexive, symmetric, transitive and equivalence relations. One to one and onto functions.

2. Inverse Trigonometric Functions

Definition, range, domain, principal value branch.

Unit-II: Algebra

1. Matrices

Concept, notation, order, equality, types of matrices, zero and identity matrix, transpose of a matrix, symmetric and skew symmetric matrices. Operation on matrices: Addition and multiplication and multiplication with a scalar. Simple properties of addition, multiplication and scalar multiplication. Non-commutativity of multiplication of matrices, Invertible matrices; (Here all matrices will have real entries).

2. Determinants

Determinant of a square matrix (up to 3 x 3 matrices), minors, co-factors and applications of determinants in finding the area of a triangle. Adjoint and inverse of a square matrix. Solving system of linear equations in two or three variables (having unique solution) using inverse of a matrix.

Unit-III: Calculus

1. Continuity and Differentiability

Continuity and differentiability, derivative of composite functions, chain rule, derivative of inverse trigonometric functions, derivative of implicit functions. Concept of exponential and logarithmic functions. Derivatives of logarithmic and exponential functions. Logarithmic differentiation, derivative of functions expressed in parametric forms. Second order derivatives.

2. Applications of Derivatives

Applications of derivatives: increasing/decreasing functions, tangents and normals, maxima and minima (first derivative test motivated geometrically and second derivative test given as a provable tool). Simple problems (that illustrate basic principles and understanding of the subject as well as s reallife situations).

Unit-V: Linear Programming

1. Linear Programming

Introduction, related terminology such as constraints, objective function, optimization, different types of linear programming (L.P.) problems. Graphical method of solution for problems in two variables, feasible and infeasible regions (bounded), feasible and infeasible solutions, optimal feasible solutions (up to three non-trivial constraints).

INTERNAL ASSESSMENT	**10MARKS**
PeriodicTest/Chapter End Test/Unit Test	5Marks
Mathematics Activities: Activity file record +Term end assessment of one activity &Viva	5 Marks

Note: For activities NCERT Lab Manual may be referred

ACTIVITY		**(5 MARKS)**
Sl No	ACTIVITIES	TERM - I
1	ACTIVITY 1(To verify that the relation R in the set L of all lines in a plane, defined by R = {(l, m) : l || m} is an equivalence relation)	
2	ACTIVITY 2(To draw the graph of 1 sin $^{-1}$x , using the graph of sin x and demonstrate the concept of mirror reflection (about the line y = x)	
3	ACTIVITY 3(To find analytically the limit of a function f (x) at x = c and also to check the continuity of the function at that point)	
4	ACTIVITY 4(To construct an open box of maximum volume from a given rectangular sheet by cutting equal squares from each corner)	

Unit-III: Calculus

1. *Integrals :

Integration as inverse process of differentiation. Integration of a variety of functions by substitution, by partial fractions and by parts, Evaluation of simple integrals of the following types and problems based on them.

$\int\frac{dx}{x^2\pm a^2}$,$\int\frac{1}{\sqrt{x^2\pm a^2}}dx$, $\int\frac{dx}{\sqrt{a^2-x^2}}$, $\int\frac{dx}{ax^2+bx+c}$dx , $\int\frac{dx}{\sqrt{ax^2+bx+c}}$, $\int\frac{px+q}{ax^2+bx+c}$ dx, $\int\frac{px+q}{\sqrt{ax^2+bx+c}}$dx ,

$\int\sqrt{a^2\pm x^2}$dx, $\int\sqrt{x^2-a^2}\,dx$ Fundamental Theorem of Calculus (without proof).Basic properties of definite integrals and evaluation of definite integrals.

2. *Applications of the Integrals :

Applications in finding the area under simple curves, especially lines, parabolas; area of circles /ellipses (in standard form only) (the region should be clearly identifiable).

NB: The * marked chapters will be taught before TERM – I, but not asked in TERM – I and it will be asked in TERM – II.

NB:-Assessment of Activities

TERM – I and Term - II

Record – 2 Marks

Viva voce - 1 Mark

Activity – 2 Marks (Out of above 4 activities)

Total Internal Assessment will be done for 10 marks (5 from activity and 5 from Periodic test/Unit test/ Chapter End Test).

SYLLABUS DETAILS FOR TERM – II

Unit-III: Calculus

1. Integrals :(Will be taught before TERM – I)

Integration as inverse process of differentiation. Integration of a variety of functions by substitution, by partial fractions and by parts, Evaluation of simple integrals of the following types and problems based on them.

$\int\frac{dx}{x^2\pm a^2}$,$\int\frac{1}{\sqrt{x^2\pm a^2}}dx$, $\int\frac{dx}{\sqrt{a^2-x^2}}$, $\int\frac{dx}{ax^2+bx+c}$dx , $\int\frac{dx}{\sqrt{ax^2+bx+c}}$, $\int\frac{px+q}{ax^2+bx+c}$ dx, $\int\frac{px+q}{\sqrt{ax^2+bx+c}}$dx ,

$\int\sqrt{a^2\pm x^2}$dx, $\int\sqrt{x^2-a^2}\,dx$ Fundamental Theorem of Calculus (without proof).Basic properties of definite integrals and evaluation of definite integrals.

2. Applications of the Integrals :(Will be taught before TERM – I)

Applications in finding the area under simple curves, especially lines, parabolas; area of circles /ellipses (in standard form only) (the region should be clearly identifiable).

3. Differential Equations :

Definition, order and degree, general and particular solutions of a differential equation. Solution of differential equations by method of separation of variables, solutions of homogeneous differential equations of first order and first degree of the type: $dydx$ = f(y/x). Solutions of linear differential equation of the type:

$\frac{dy}{dx}$ + py = q, where p and q are functions of x or constant.

Unit-IV: Vectors and Three-Dimensional Geometry

1. Vectors

Vectors and scalars, magnitude and direction of a vector. Direction cosines and direction ratios of a vector. Types of vectors (equal, unit, zero, parallel and collinear vectors), position vector of a point, negative of a vector, components of a vector, addition of vectors, multiplication of a vector by a scalar, position vector of a point dividing a line segment in a given ratio. Definition, Geometrical Interpretation, properties and application of scalar (dot) product of vectors, vector (cross) product of vectors.

2. Three - dimensional Geometry

Direction cosines and direction ratios of a line joining two points. Cartesian equation and vector equation of a line, coplanar and skew lines, shortest distance between two lines. Cartesian and vector equation of a plane. Distance of a point from a plane.

Unit-VI: Probability

1. Probability

Conditional probability, multiplication theorem on probability, independent events, total probability, Bayes' theorem, Random variable and its probability distribution.

INTERNALASSESSMENT	**10MARKS**
PeriodicTest/Chapter End Test/Unit Test	5Marks
Mathematics Activities: Activity file record +Term end assessment of one activity &Viva	5 Marks

Note: For activities NCERT Lab Manual may be referred.

ACTIVITY		**(5 MARKS)**
Sl No	ACTIVITIES	TERM - II
1	ACTIVITY 5(To verify that angle in a semi-circle is a right angle, using vector method)	
2	ACTIVITY 6(To find the distance of given point (in space) from a plane (passing through three non-collinear points) by actual measurement and also analytically)	
3	ACTIVITY 7(To measure the shortest distance between two skew lines and verify it analytically)	
4	ACTIVITY 8(To explain the computation of conditional probability of a given event A, when event B has already occurred, through an example of throwing a pair of dice)	

NB :.
Assessment of Activities
TERM – I and Term - II
Record – 2 Marks
Viva voce - 1 Mark
Activity – 2 Marks(Out of above 4 activities)

Total Internal Assessment will be done for 10 marks (5 from activity and 5 from Periodic test/Unit test/ChapterEndTest)

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 XII Published by NCERT
5. Any related books and manuals brought out by NCERT (Also consider multimedia)

QUESTIONWISE BREAK-UP

1. **BREAK UP OF QUESTIONS (as per modified term-wise pattern)**

Term I Examination:

- The Question Paper will have Multiple Choice Questions (MCQ) including case-based MCQs and MCQs on assertion-reasoning type.
- Duration of test will be 90 minutes.
- This examination would be held around November-December 2021.

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Term II Examination/ Year-end Examination:

- The Question Paper will have (case-based/ situation based, open ended- short answer/ long answer type) questions.
- Duration of test will be 2 hours.
- This examination would be held around March-April 2022 at the examination centres fixed by the Board.

2. **TIME SCHEDULE FOR STD – XII EXAMINATIONS**:-

NAME OF THE TEST	MONTH AND DATES	FULL MARK	SYLLABUS
PRE-TERM-I	21 OCT TO 30 OCT 2021	35	TERM-I
TERM-I	NOVEMBER/DECEMBER-2021	AS PER CBSE GUIDELINES	TERM-I
PRE-TERM-II	7 FEB TO 16 FEB 2022	35	TERM-II
TERM-II	MARCH/APRIL-2022	AS PER CBSE GUIDELINES	TERM-II

***N.B.** –1. End of topic/ unit test will be conducted at school level along with internal assessment/ exploratory activities/ practicals.

2. The question paper pattern and typology shall be at par with the sample paper to be released by CBSE.

COURSE STRUCTURE (THEORY)

Class-XII (Term-I)

Time : 1 and 1/2 hrs **F.M. : 35**

UNITS	NAME OF THE TEST	PRE-TERM-I	TERM-I
	TIME PERIOD OF THE TEST	21 OCT to 30 OCT 2021	NOVEMBER/ DECEMBER-2021
	NAME OF THE CHAPTER		
Unit I	**Electrostatics**	17	17
	Chapter 1 : Electric Charges and Fields		
	Chapter 2: Electrostatic Potential and Capacitance		
Unit II	**Current Electricity**		
	Chapter 3: Current Electricity		
Unit III	**Magnetic effect of Current and Magnetism**	18	18
	Chapter 4: Moving charges and magnetism		
	Chapter 5: Magnetism and Matter		
Unit IV	**Electromagnetic Induction and Alternating Current**		
	Chapter 6: Electromagnetic Induction		
	Chapter 7: Alternating Current		
	TOTAL	**35**	**35**

N.B.: 20% weightage questions may be asked from Exemplar Text book in all the examination.

SYLLABUS DETAILS

UNIT-I: ELECTROSTATICS

Chapter -1: Electric Charges and Field

Electric Charges; Conservation of charge, Coulomb's law-force between two-point charges, forces between multiple charges; superposition principle and continuous charge distribution. Electric field, electric field due to a point charge, electric field lines, electric dipole, electric field due to a dipole, torque on a dipole in uniform electric field. Electric flux, statement of Gauss's theorem and its applications to find field due to infinitely long straight wire, uniformly charged infinite plane sheet

Chapter - 2: Electrostatic Potential and capacitance

Electric potential, potential difference, electric potential due to a point charge, a dipole and system of charges; equipotential surfaces, electrical potential energy of a system of two-point charges and of electric dipole in an electrostatic field. Conductors and insulators, free charges and bound charges inside a conductor. Dielectrics and electric polarisation, capacitors and capacitance, combination of capacitors in series and in parallel, capacitance of a parallel plate capacitor with and without dielectric medium between the plates, energy stored in a capacitor.

UNIT-II: CURRENT ELECTRICITY

Chapter - 3 Current Electricity

Electric current, flow of electric charges in a metallic conductor, drift velocity, mobility and their relation with electric current; Ohm's law, electrical resistance, V-I characteristics (linear and non-linear), electrical energy and power, electrical resistivity and conductivity; temperature dependence of resistance. Internal resistance of a cell, potential difference and emf of a cell, combination of cells in series and in parallel, Kirchhoff's laws and simple applications, Wheatstone bridge, metre bridge (**qualitative ideas only).** Potentiometer - principle and its applications to measure potential difference and for comparing EMF of two cells; measurement of internal resistance of a cell **(qualitative ideas only)**

UNIT-III: MAGNETIC EFFECTS OF CURRENT AND MAGNETISM

Chapter -4: Moving charges and Magnetism

Concept of magnetic field, Oersted's experiment. Biot - Savart law and its application to current carrying circular loop. Ampere's law and its applications to infinitely long straight wire. Straight and toroidal solenoids (only qualitative treatment), force on a moving charge in uniform magnetic and electric fields. Force on a current-carrying conductor in a uniform magnetic field, force between two parallel current-carrying conductors-definition of ampere, torque experienced by a current loop in uniform magnetic field; moving coil galvanometer-its current sensitivity and conversion to ammeter and voltmeter.

Chapter -5: Magnetism and matter

Current loop as a magnetic dipole and its magnetic dipole moment, magnetic dipole moment of a revolving electron, bar magnet as an equivalent solenoid, magnetic field lines; earth's magnetic field and magnetic elements.

UNIT-IV: ELECTROMAGNETIC INDUCTION AND ALTERNATING CURRENTS

Chapter -6: Electromagnetic Induction

Electromagnetic induction; Faraday's laws, induced EMF and current; Lenz's Law, Eddy currents. Self and mutual induction.

Chapter -7: Alternating Currents

Alternating currents, peak and RMS value of alternating current/voltage; reactance and impedance; LC oscillations (qualitative treatment only), LCR series circuit, resonance; power in AC circuits. AC generator and transformer.

PRACTICALS(TERM-I)

Syllabus for Term I

First term practical examination will be organised by schools as per the directions of CBSE. The record to be submitted by the students at the time of first term examination has to include a record of at least 4 Experiments and 3 Activities to be demonstrated by teacher.

EVALUATION SCHEME

Time Allowed:1 and 1/2 hrs **Max Marks:15**

	TERM-I
Two experiments	8 Marks
Practical record (experiment and activities)	2 Marks
Viva on experiments and activities	5 Marks
Total	**15 Marks**

Experiments assigned for Term I

1. To determine resistivity of two / three wires by plotting a graph between potential difference versus current.
2. To find resistance of a given wire / standard resistor using metre bridge.

OR

To verify the laws of combination (series) of resistances using a metre bridge.

OR

To verify the laws of combination (parallel) of resistances using a metre bridge.

3. To compare the EMF of two given primary cells using potentiometer.

OR

To determine the internal resistance of given primary cell using potentiometer.

4. To determine resistance of a galvanometer by half-deflection method and to find its figure of merit.
5. To convert the given galvanometer (of known resistance and figure of merit) into a voltmeter of desired range and to verify the same.

OR

To convert the given galvanometer (of known resistance and figure of merit) into an ammeter of desired range and to verify the same.

6. To find the frequency of AC mains with a sonometer.

Activities assigned for Term I

1. To measure the resistance and impedance of an inductor with or without iron core.
2. To measure resistance, voltage (AC/DC), current (AC) and check continuity of a given circuit using multimeter.
3. To assemble a household circuit comprising three bulbs, three (on/off) switches, a fuse and a power source.
4. To assemble the components of a given electrical circuit.
5. To study the variation in potential drop with length of a wire for a steady current.
6. To draw the diagram of a given open circuit comprising at least a battery, resistor/rheostat, key, ammeter and voltmeter. Mark the components that are not connected in proper order and correct the circuit and also the circuit diagram.

CLASS-XII (TERM-II)

Time: 2 hours **F. M. :35**

UNITS	NAME OF THE TEST	PRE-TERM-II	TERM-II
	TIME PERIOD OF THE TEST	7 FEB to 16 FEB 2022	MARCH/ APRIL-2022
	NAME OF THE CHAPTER		
Unit-V	**Electromagnetic Waves**	17	17
	Chapter 8: Electromagnetic Waves		
Unit-VI	**Optics**		
	Chapter 9: Ray Optics and Optical Instruments		
	Chapter 10 : Wave Optics		
Unit-VII	**Dual Nature of Radiation and Matter**	11	11
	Chapter 11:Dual Nature of Radiation and Matter		
Unit-VIII	**Atoms and Nuclei**		
	Chapter 12: Atoms		
	Chapter 13: Nuclei		
Unit–IX	**Electronics Devices**	07	07
	Chapter14: Semiconductor Electronics: Materials, Devices and Simple Circuits.		
	TOTAL	**35**	**35**

N.B.: 20% weightage questions may be asked from Exemplar Text book in all the examination.

UNIT-V: ELECTROMAGNETIC WAVES

Chapter -8: Electromagnetic waves

Electromagnetic waves, their characteristics, their Transverse nature (qualitative ideas only).

Electromagnetic spectrum (radio waves, microwaves, infrared, visible, ultraviolet, X-rays, gamma rays) including elementary facts about their uses.

UNIT-VI: OPTICS

Chapter -9 :Ray Optics and Optical instruments

Refraction of light, total internal reflection and its applications, optical fibers, refraction at spherical surfaces, lenses, thin lens formula, lensmaker's formula, magnification, power of a lens, combination of thin lenses in contact, refraction of light through a prism.

Optical instruments: Microscopes and astronomical telescopes (reflecting and refracting) and their magnifying powers.

Chapter -10: Wave optics

Wave front and Huygen's principle, reflection and refraction of plane wave at a plane surface using wave fronts. Proof of laws of reflection and refraction using Huygen's principle. Interference, Young's double slit experiment and expression for fringe width, coherent sources and sustained interference of light, diffraction due to a single slit, width of central maximum

UNIT VII: DUAL NATURE OF MATTER AND RADIATION

Chapter -11: Dual Nature of Radiation and Matter

Dual nature of radiation, Photoelectric effect, Hertz and Lenard's observations; Einstein's photoelectric equation-particle nature of light.

Experimental study of photoelectric effect

Matter waves-wave nature of particles, de-Broglie relation

UNIT VIII: ATOMS AND NUCLEI

Chapter -12: Atoms

Alpha-particle scattering experiment; Rutherford's model of atom; Bohr model, energy levels, hydrogen spectrum.

Chapter -13: Nuclei

Composition and size of nucleus Nuclear force, Mass-energy relation, mass defect, nuclear fission, nuclear fusion.

UNIT IX: ELECTRONIC DEVICES

Chapter -14: Semiconductor electronics, Materials, Devices and Simple Circuits

Energy bands in conductors, semiconductors and insulators (qualitative ideas only) Semiconductor diode - I-V characteristics in forward and reverse bias, diode as a rectifier; Special purpose p-n junction diodes: LED, photodiode, solar cell.

PRACTICALS (TERM-II)

Syllabus for Term II

The second term practical examination will be organised by schools as per the directions of CBSE and viva will be taken by both internal and external observers. The record to be submitted by the students at the time of second term examination has to include a record of at least 4 Experiments and 3 Activities to be demonstrated by teacher.

EVALUATION SCHEME

Time Allowed:1 and 1/2hrs **Max Marks:15**

	TERM-I
Two experiments	8 Marks
Practical record (experiment and activities)	2 Marks
Viva on experiments and activities	5 Marks
Total	**15 Marks**

Experiments assigned for Term-II

1. To find the focal length of a convex lens by plotting graphs between u and v or between 1/u and1/v.
2. To find the focal length of a convex mirror, using a convex lens.

OR

To find the focal length of a concave lens, using a convex lens.

3. To determine angle of minimum deviation for a given prism by plotting a graph between angle of incidence and angle of deviation.
4. To determine refractive index of a glass slab using a travelling microscope.
5. To find refractive index of a liquid by using convex lens and plane mirror.
6. To draw the I-V characteristic curve for a p-n junction diode in forward bias and reverse bias.

Activities assigned for Term-II

1. To identify a diode, an LED, a resistor and a capacitor from a mixed collection of such items.
2. Use of multimeter to see the unidirectional flow of current in case of a diode and an LED and check whether a given electronic component (e.g., diode) is in working order.
3. To study effect of intensity of light (by varying distance of the source) on an LDR.
4. To observe refraction and lateral deviation of a beam of light incident obliquely on a glass slab.
5. To observe polarization of light using two Polaroids.
6. To observe diffraction of light due to a thin slit.
7. To study the nature and size of the image formed by a (i) convex lens, (ii) concave mirror, on a screen by using a candle and a screen (for different distances of the candle from the lens/mirror).
8. To obtain a lens combination with the specified focal length by using two lenses from the given set of lenses.

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 XII Published by NCERT
5. Any related books and manuals brought out by NCERT (Also consider multimedia)

QUESTION PAPER

The Question Paper will have Multiple Choice Questions (MCQ) including case-based MCQs and MCQs on assertion-reasoning type.

N.B

The Sample Question Papers for the academic session (21-22) may also be referred to for details of changes in the QP design of the subjects.

COURSE STRUCTURE (THEORY)

Time: 90 minutes **F.M:35**

Sl. No.	UNIT	TYPE OF TEST	PT-I (35 Marks)	PT-II (35Marks)	PRE-TERM-I (35Marks)	PT-III (35Marks)	PRE-TERM-II (35Marks)
		TIME PERIOD OF THE TEST	26 JULY-31JULY	13SEPT-18-SEPT	21OCT-30OCT	24JAN-29JAN	17FEB-24FEB
		NAME OF THE CHAPTER					
1	Unit – I	Solid state	**5**	**5**	**10**		
2	Unit – II	Solution	**8**	**7**			
3	Unit –VII	p – Block elements		**8**	**10**		
4	Unit –X	Haloalkanes and haloarenes	**10**	**7**	**15**		
5	Unit -XI	Alcohols, Phenols and Ethers	**12**	**8**			
6	Unit – XIV	Bio molecules					
7	Unit –III	Electrochemistry				**8**	**13**
8	Unit- IV	Chemical Kinetics				**8**	

9	Unit –V	Surface Chemistry				**4**	
10	Unit – VIII	d-and f-Block Elements					**9**
11	Unit -IX	Coordination Compounds					
12	Unit -XII	Aldehydes, Ketones and Carboxylic Acids				**10**	**13**
13	Unit -XIII	Amines				**5**	
		Total	**35**	**35**	**35**	**35**	**35**

SYLLABUS DETAILS

UNIT I: SOLID STATE

Classification of solids based on different binding forces: molecular, ionic, covalent and metallic solids, amorphous and crystalline solids (elementary idea). Unit cell in two dimensional and three dimensional lattices, calculation of density of unit cell, packing in solids, packing efficiency,voids, number of atoms per unit cell in a cubic unit cell, point defects.

UNIT II: SOLUTIONS

Types of solutions, expression of concentration of solutions of solids in liquids, solubility of gases in liquids, solid solutions, Raoult's law, colligative properties - relative lowering of vapour pressure, elevation of boiling point, depression of freezing point, osmotic pressure, determination of molecular masses using colligative properties.

UNIT III: ELECTROCHEMISTRY

Redox reactions, EMF of a cell, standard electrode potential, Nernst equation and its application to chemical cells, Relation between Gibbs energy change and EMF of a cell, conductance in electrolytic solutions, specific and molar conductivity, variations of conductivity with concentration, Kohlrausch's Law, electrolysis.

UNIT IV: CHEMICAL KINETICS

Rate of a reaction (Average and instantaneous), factors affecting rate of reaction : concentration, temperature, catalyst; order and molecularity of a reaction, rate law and specific rate constant, integrated rate equations and half-life (only for zero and first order reactions).

UNIT V: SURFACE CHEMISTRY

Adsorption - physisorption and chemisorption, factors affecting adsorption of gases on solids, colloidal state: distinction between true solutions, colloids and suspension; lyophilic, lyophobic, multi-molecular and macromolecular colloids; properties of colloids; Tyndall effect, Brownian movement, electrophoresis, coagulation.

UNIT VII: "p"-BLOCK ELEMENTS

Group -15 Elements: General introduction, electronic configuration, occurrence, oxidation states, trends in physical and chemical properties; Nitrogen preparation properties and uses; compounds of Nitrogen: preparation and properties of Ammonia and Nitric Acid.

Group 16 Elements: General introduction, electronic configuration, oxidation states, occurrence, trends in physical and chemical properties, dioxygen: preparation, properties and uses, classification of Oxides, Ozone, Sulphur -allotropic forms; compounds of Sulphur: preparation

properties and uses of Sulphur-dioxide, Sulphuric Acid: properties and uses; Oxoacids of Sulphur (Structures only).
Group 17 Elements: General introduction, electronic configuration, oxidation states, occurrence, trends in physical and chemical properties; compounds of halogens, Preparation, properties and uses of Chlorine and Hydrochloric acid, interhalogen compounds, Oxoacids of halogens (structures only).
Group 18 Elements: General introduction, electronic configuration, occurrence, trends in physical and chemical properties, uses.

UNIT VIII: "d" AND "f" BLOCK ELEMENTS

General introduction, electronic configuration, occurrence and characteristics of transition metals, general trends in properties of the first row transition metals –metallic character, ionization enthalpy, oxidation states, ionic radii, colour, catalytic property, magnetic properties, interstitial compounds, alloy formation.
Lanthanoids - Electronic configuration, oxidation states and lanthanoid contraction and its consequences.

UNIT IX: COORDINATION COMPOUNDS

Coordination compounds - Introduction, ligands, coordination number, colour, magnetic properties and shapes, IUPAC nomenclature of mononuclear coordination compounds. Bonding, Werner's theory, VBT, and CFT.

UNIT X: HALOALKANES AND HALOARENES

Haloalkanes: Nomenclature, nature of C–X bond, physical and chemical properties, optical rotation mechanism of substitution reactions.
Haloarenes: Nature of C–X bond, substitution reactions (Directive influence of halogen in monosubstituted compounds only).

UNIT XI: ALCOHOLS, PHENOLS AND ETHERS

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

UNIT XII: ALDEHYDES, KETONES AND CARBOXYLIC ACIDS

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

UNIT XIII: AMINES

Amines: Nomenclature, classification, structure, methods of preparation, physical and chemical properties, uses, identification of primary, secondary and tertiary amines.

UNIT XIV: BIOMOLECULES

Carbohydrates - Classification (aldoses and ketoses), monosaccahrides (glucose and fructose), D-L configuration
Proteins -Elementary idea of - amino acids, peptide bond, polypeptides, proteins, structure of proteins - primary, secondary, tertiary structure and quaternary structures (qualitative idea only), denaturation of proteins.
Nucleic Acids: DNA and RNA

PRACTICALS

EVALUATION SCHEME FOR EXAMINATION	TERM-I	TERM-II
VOLUMETRIC ANALYSIS	4	4
SALT ANALYSIS	4	4
CONTENT BASED EXPERIMENT	2	2
CLASS RECORD AND VIVA(INTERNAL EXAMINER)	5	
PROJECT WORK AND VIVA(INTERNAL AND EXTERNAL BOTH)		5
Total	**15**	**15**

PRACTICAL SYLLABUS

TERM-I

(1) Volumetric analysis (4 marks)

Determination of concentration/ molarity of $KMnO_4$ solution by titrating it against a standard solution of:

i. Oxalic acid,

ii. Ferrous Ammonium Sulphate

(Students will be required to prepare standard solutions by weighing themselves).

(2) Salt analysis (Qualitative analysis) (4 marks)

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

Cations- Pb^{2+}, Cu^{2+}, As^{3+}, Al^{3+}, Fe^{3+}, Mn^{2+}, Ni^{2+}, Zn^{2+}, Co^{2+}, Ca^{2+}, Sr^{2+}, Ba^{2+}, Mg^{2+}, NH_4^+

Anions – $(CO_3)^{2-}$, S^{2-} , NO_2^- , SO_3^{2-} , SO_4^{2-} , NO_3^-, Cl^- , Br^- , I^- , PO_4^{3-} , $C_2O_4^{2-}$,CH_3COO^-

(Note: Insoluble salts excluded)

(3) Content Based Experiments (2 marks)

A. Chromatography

i. Separation of pigments from extracts of leaves and flowers by paper chromatography and determination of Rf values.

ii. Separation of constituents present in an inorganic mixture containing two cations only (constituents having large difference in Rf values to be provided).

B. Characteristic tests of carbohydrates, fats and proteins in pure samples and their detection in given foodstuffs.

TERM-II

1) Volumetric analysis (4 marks)

Determination of concentration/ molarity of KMnO4 solution by titrating it against a standard solution of:

i. Oxalic acid,

ii. Ferrous Ammonium Sulphate

(Students will be required to prepare standard solutions by weighing themselves).

2) Salt analysis (Qualitative analysis) (4 marks)

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

Cations- Pb^{2+}, Cu^{2+}, As^{3+}, Al^{3+}, Fe^{3+}, Mn^{2+}, Ni^{2+}, Zn^{2+}, Co^{2+}, Ca^{2+}, Sr^{2+}, Ba^{2+}, Mg^{2+}, NH_4^+

Anions – $(CO_3)^{2-}$, S^{2-} , NO_2^- , SO_3^{2-} , SO_4^{2-} , NO_3^-, Cl^- , Br^- , I^- , PO_4^{3-} , $C_2O_4^{2-}$,CH_3COO^-

(Note: Insoluble salts excluded)

3) Content based experiment

A. Preparation of Inorganic Compounds

Preparation of double salt of Ferrous Ammonium Sulphate or Potash Alum. Preparation of Potassium Ferric Oxalate.

B. Tests for the functional groups present in organic compounds:

Unsaturation, alcoholic, phenolic, aldehydic, ketonic, carboxylic and amino (Primary) group

PROJECT

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

A few suggested Projects.

- Study of the presence of oxalate ions in guava fruit at different stages of ripening.
- Study of quantity of casein present in different samples of milk.
- Preparation of soybean milk and its comparison with the natural milk with respect to curd formation, effect of temperature, etc.
- Study of the effect of Potassium Bisulphate as food preservative under various conditions (temperature, concentration, time, etc.)
- Study of digestion of starch by salivary amylase and effect of pH and temperature on it.
- Comparative study of the rate of fermentation of following materials: wheat flour, gram flour, potato juice, carrot juice, etc.
- Extraction of essential oils present in Saunf (aniseed), Ajwain (carum), Illaichi (cardamom).
- Study of common food adulterants in fat, oil, butter, sugar, turmeric power, chilli powder and pepper.

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-XII (NCERT).
2. EXEMPLAR BIOLOGY-CLASS-XII (NCERT).
3. BIOLOGY SUPPLEMENTARY MATERIAL (REVISED), AVAILABLE ON CBSE WEBSITE.
4. OTHER RELATED BOOKS AND MANUALS BROUGHT OUT BY NCERT (INCLUDING MULTIMEDIA).
5. COMPREHENSIVE LABORATORY MANUAL IN BIOLOGY-XII (LAXMI PUBLICATION).

Question Paper Design

XII Biology (Theory)

Term I (2021-22)

Time: 90 Minutes **Max. Marks: 35**

Typology of Questions → / Competencies ↓	Section A Case based MCQs (5marks)	Section B Assertion & Reason Questions (1 mark)	Total No of Questions	%
Demonstrate Knowledge and Understanding	2	7	9	50%
Application of Knowledge / Concepts	1	6	7	30%
Formulate, Analyse, Evaluate and Create	1	2	3	20%
Total	4(5) = 20	15 (1)=15	19 (35)	100%

Note: 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.

Question Paper Design

XII Biology (Theory)

Term II (2021-22)

Time: 2 HOURS **Max. Marks: 35**

Typology of Questions →	Section A	Section B Short/Long			Section C	Total	%
Competencies ↓	Case based (5marks)	SA question (2 marks)	LA-I (3 marks)	LA-II (5 marks)	Situation based (5 marks)		
Demonstrate Knowledge and Understanding	1	1		1	1	4	50%
Application of Knowledge / Concepts	1		2			3	30%
Analyse, Evaluate and Create		1			1	2	20%
Total	2(5) =10	2(2) =4	2(3)=6	1(5) =5	2(5) =10	9(35)	100%

Note: 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'.

SUGGESTIVE VERBS FOR VARIOUS COMPETENCIES

- **Demonstrate Knowledge and Understanding**
  State, name, list, identify, define, suggest, describe, outline, summarize, etc.

- **Application of Knowledge/Concepts**
  Calculate, illustrate, show, adapt, explain, distinguish, etc.

- **Formulate, Analyze, Evaluate and Create**
  Interpret, analyse, compare, contrast, examine, evaluate, discuss, construct, etc.

MARK DISTRIBUTION:
XII BIOLOGY(2021-22)

Time: 90 Minutes (Term I)/ 2 Hours (Term II) **Max. Marks: 35**

UNIT	**Name of the Unit**	**Pre -Term I**	**Term I (As per CBSE guidelines)**	**Pre-Term II**	**Term II (As per CBSE guidelines)**
	Time period of the Test	21-30 October 2021	Nov/Dec 2021	7 Feb-16 Feb 2022	Mar/Apr 2022
6	Reproduction	15	15		
7	Genetics and Evolution	20	20		
8	Biology and Human Welfare			14	14
9	Biotechnology and its Applications			11	11
10	Ecology and Environment			10	10
	Total	**35**	**35**	**35**	**35**

XII

BIOLOGY

(Code No. 044)

(COURSE STRUCTURE-2021-22)

EVALUATION SCHEME		
Theory		
Units	Term – I	Marks
VI	Reproduction: Chapter - 2, 3 and 4	15
VII	Genetics and Evolution: Chapter - 5 and 6	20
Units	Term – II	Marks
VIII	Biology and Human Welfare: Chapter - 8 and 10	14
IX	Biotechnology and its Applications: Chapter - 11 and 12	11
X	Ecology and Environment: Chapter - 13 and 15	10
Total Theory (Term - I and Term - II)		70
Practicals Term – I		15
Practicals Term – II		15
Total		100

THEORY

TERM - I

Unit-VI Reproduction

Chapter-2: Sexual Reproduction in Flowering Plants

Flower structure; development of male and female gametophytes; pollination - types, agencies and examples; outbreeding devices; pollen-pistil interaction; double fertilization; post fertilization events - development of endosperm and embryo, development of seed and formation of fruit; special modes- apomixis, parthenocarpy, polyembryony; Significance of seed dispersal and fruit formation.

Chapter-3: Human Reproduction

Male and female reproductive systems; microscopic anatomy of testis and ovary; gametogenesis- spermatogenesis and oogenesis; menstrual cycle; fertilisation, embryo development up to blastocyst formation, implantation; pregnancy and placenta formation (elementary idea); parturition (elementary idea); lactation (elementary idea).

Chapter-4: Reproductive Health

Need for reproductive health and prevention of Sexually Transmitted Diseases (STDs); birth control - need and methods, contraception and medical termination of pregnancy (MTP); amniocentesis; infertility and assisted reproductive technologies - IVF, ZIFT, GIFT (elementary idea for general awareness).

Unit-VII Genetics and Evolution

Chapter-5: Principles of Inheritance and Variation

Heredity and variation: Mendelian inheritance; deviations from Mendelism incomplete dominance, co-dominance, multiple alleles and inheritance of blood groups, pleiotropy; elementary idea of polygenic inheritance; chromosome theory of inheritance; chromosomes and genes; Sex determination - in human being, birds and honey bee; linkage and crossing over; sex linked inheritance - haemophilia, colour blindness; Mendelian disorders in humans - thalassemia; chromosomal disorders in humans; Down's syndrome, Turner's and Klinefelter's syndromes.

Chapter-6: Molecular Basis of Inheritance

Search for genetic material and DNA as genetic material; Structure of DNA and RNA; DNA packaging; DNA replication; Central Dogma; transcription, genetic code, translation; gene expression and regulation - lac operon; Genome, Human and rice genome projects; DNA fingerprinting.

TERM - II

Unit-VIII Biology and Human Welfare

Chapter-8: Human Health and Diseases

Pathogens; parasites causing human diseases (malaria, dengue, chikungunya, filariasis, ascariasis, typhoid, pneumonia, common cold, amoebiasis, ring worm) and their control; Basic concepts of immunology - vaccines; cancer, HIV and AIDS; Adolescence - drug and alcohol abuse.

Chapter-10: Microbes in Human Welfare

Microbes in food processing, industrial production, sewage treatment, energy generation and microbes as bio-control agents and bio-fertilizers. Antibiotics; production and judicious use.

Unit-IX Biotechnology and its Applications

Chapter-11: Biotechnology - Principles and Processes

Genetic Engineering (Recombinant DNA Technology).

Chapter-12: Biotechnology and its Application

Application of biotechnology in health and agriculture: Human insulin and vaccine production, stem cell technology, gene therapy; genetically modified organisms – Bt. crops; transgenic animals; biosafety issues, biopiracy and patents.

Unit-X Ecology and Environment

Chapter-13: Organisms and Populations

Organisms and environment: Habitat and niche, population and ecological adaptations; population interactions - mutualism, competition, predation, parasitism; population, attributes- growth, birth rate and death rate, age distribution.

Chapter-15: Biodiversity and its Conservation

Biodiversity - Concept, patterns, importance; loss of biodiversity; biodiversity conservation; hotspots, endangered organisms, extinction, Red Data Book, Sacred Groves, biosphere reserves, national parks, wildlife, sanctuaries and Ramsar sites.

PRACTICALS

Evaluation Scheme			
	TERM - I	TERM - II	MARKS
Part A			
One Major Experiment	Experiment No. - 1	Experiment No. - 3	4
One Minor Experiment	Experiment No. - 2	Experiment No. - 4, 5	3
Part B			
Spotting (3 Spots of 1 mark each)	B.1, 2, 3, 4, 5	B.6, 7, 8	3
Practical Record + Investigatory Project &Record + Viva Voce			5
Total			15

Max. Marks: 15 for each Term

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

A. List of Experiments

TERM - I:

1. Isolate DNA from available plant material such as spinach, green pea seeds, papaya, etc.
2. Prepare a temporary mount to observe pollen germination.

TERM - II:

3. Prepare a temporary mount of onion root tip to study mitosis.
4. Collect water from two different water bodies around you and study them for pH, clarity and presence of any living organism.
5. Collect and study soil from at least two different sites and study them for texture, moisture content, pH and water holding capacity. Correlate with the kinds of plants found in them.

B. Study/Observation of the following (Spotting)

TERM - I:

1. Flowers adapted to pollination by different agencies (wind, insects, birds).
2. Identification of stages of gamete development, i.e., T.S. of testis and T.S. of ovary through permanent slides (from grasshopper/mice).
3. Meiosis in onion bud cell or grasshopper testis through permanent slides. B.4 T.S. of blastula through permanent slides (Mammalian).
4. Prepared pedigree charts of any one of the genetic traits such as rolling of tongue, blood groups, ear lobes, widow's peak and colour blindness.

TERM - II:

5. Common disease - causing organisms like Ascaris, Entamoeba, Plasmodium, any fungus causing ringworm through permanent slides, models or virtual images. Comment on symptoms of diseases that they cause.
6. Two plants and two animals (models/virtual images) found in xeric conditions. Comment upon their morphological adaptations.
7. Two plants and two animals (models/virtual images) found in aquatic conditions. Comment upon their morphological adaptations.

COMPUTER SCIENCE (083)

PRESCRIBED BOOKS:

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

COURSE STRUCTURE (THEORY)

TIME PERIOD		21 Oct'21 To 30 Oct'21	Nov/Dec'21	7 Feb'22 to 16 Feb'22	Mar/Apr 2022
Unit	**Name of Unit**	**PRE TERM-I**	**TERM-1**	**PRE TERM-II**	**TERM-II**
1	**Computational Thinking and Programming – 2**		35		5
	Revision of the basics of Python	12		1	
	Functions	8		1	
	Using Python libraries	5		1	
	File handling	10		1	
	Data-structures	--	--	1	
2	**Computer Networks**	--	--		10
	Evolution of Networking & Data Communication terminologies			1	
	Transmission media & Network devices			2	
	Network Topologies and types			1	
	Network Protocol			1	
	Mobile Telecommunication Technologies			1	
	Network Security Concepts			2	
	Introduction To Web services			1	
	E-commerce payment			1	
3	**Database Management**	--	--		20
	Database Concepts & Relational data model			2	
	Structured Query Language, General Concepts			3	
	Data Types and SQL commands:			8	
	SQL functions and Join			3	
	Interface of Python with an SQL database			4	
	TOTAL	**35**	**As per CBSE Guideline**	**35**	**As per CBSE Guideline**
After completion of Term-1 contents teachers may proceed with Term-2 contents to overcome shortage of timing for course completion.					

QUESTION LEVEL BREAK-UP

DIFFICULTY LEVEL:

1. Difficult questions - 15 %
2. Average questions - 70%
3. Easy questions - 15%

SYLLABUS DETAILS

TERM 1:

UNIT 1 : Computational Thinking and Programming - 2 (70 Theory + 50 Practical)

Prerequisites Computer Science- Class XI

- Revision of Python topics covered in Class XI.
- Functions: types of function (built-in functions, functions defined in module, user defined functions), creating user defined function, arguments and parameters, default parameters, positional parameters, function returning value(s), flow of execution, scope of a variable (global scope, local scope)
- Introduction to files, types of files (Text file, Binary file, CSV file), relative and absolute paths
  - Text file: opening a text file, text file open modes (r, r+, w, w+, a, a+), closing a text file, opening a file using with clause, writing/appending data to a text file using write() and writelines(), reading from a text file using read(), readline() and readlines(), seek and tell methods, manipulation of data in a text file
  - Binary file: basic operations on a binary file: open using file open modes (rb, rb+, wb, wb+, ab, ab+), close a binary file, import pickle module, dump() and load() method, read, write/create, search, append and update operations in a binary file
  - CSV file: import csv module, open / close csv file, write into a csv file using csv.writerow() and read from a csv file using csv.reader( )
- Python libraries: creating python libraries

TERM 2:

Unit I: Computational Thinking and Programming – 2

- Data Structure:
  - Stack, operations on stack (push & pop), implementation of stack using list.

UNIT 2 : Computer Networks (15 Theory)

- Evolution of networking: introduction to computer networks, evolution of networking (ARPANET, NSFNET, INTERNET)
- Data communication terminologies: concept of communication, components of data communication (sender, receiver, message, communication media, protocols),
- measuring capacity of communication media (bandwidth, data transfer rate), IP address,

- switching techniques (Circuit switching, Packet switching)
- Transmission media: Wired communication media (Twisted pair cable, Co-axial cable, Fiber-optic cable), Wireless media (Radio waves, Micro waves, Infrared waves)
- Network devices (Modem, Ethernet card, RJ45, Repeater, Hub, Switch, Router, Gateway, WIFI card)
- Network topologies and Network types: types of networks (PAN, LAN, MAN, WAN), networking topologies (Bus, Star, Tree)
- Network protocol: HTTP, FTP, PPP, SMTP, TCP/IP, POP3, HTTPS, TELNET, VoIP, wireless/mobile communication protocol such as GSM, GPRS and WLL
- Mobile telecommunication technologies: 1G, 2G, 3G, 4G and 5G
- Introduction to web services: WWW, Hyper Text Markup Language (HTML), Extensible Markup Language (XML), domain names, URL, website, web browser, web servers, web hosting

UNIT 3: Database Management (25 Theory + 20 Practical)

- Database concepts: introduction to database concepts and its need
- Relational data model: relation, attribute, tuple, domain, degree, cardinality, keys (candidate key, primary key, alternate key, foreign key)
- Structured Query Language: introduction, Data Definition Language and Data Manipulation Language, data type (char(n), varchar(n), int, float, date), constraints (not null, unique, primary key), create database, use database, show databases, drop database, show tables, create table, describe table, alter table (add and remove an attribute, add and remove primary key), drop table, insert, delete, select, operators (mathematical, relational and logical), aliasing, distinct clause, where clause, in, between, order by, meaning of null, is null, is not null, like, update command, delete command, aggregate functions (max, min, avg, sum, count), group by, having clause, joins: cartesian product on two tables, equi-join and natural join
- Interface of python with an SQL database:
    - connecting SQL with Python, performing insert, update, delete queries using cursor,
    - display data by using fetchone(), fetchall(), rowcount,
    - creating database connectivity applications

PRACTICAL

S.No		Marks (Total 30)	Term-1 (15 Marks)	Term-2 (15 Marks)
1	**Lab Test:** 1. Python program	**8**	**6**	**2**
	2. 3 SQL Queries based on one/two table(s), 2 output questions based on SQL queries	**4**	**---**	**4**
2	**Report file:** **Term – 1** : Minimum 15 Python programs based on Term - 1Syllabus **Term – 2** : • Minimum 3 Python programs based on Term-2 Syllabus • SQL Queries – Minimum 5 sets using one table / twotables. • Minimum 2 programs based on Python - SQL connectivity.	**7**	**4**	**3**
3	**Project (using concepts learnt in Classes 11 and 12)** Term – 1 : Synopsis of the project to be submitted by thestudents (documentation only, may not submit the codeduring Term - 1) Term - 2 : Final coding + Viva voce (Student will be allowed to modify their Term 1 document andsubmit the final executable code.)	**8**	**3**	**5**
4	**Viva voce**	**3**	**2**	**1**

1. **Suggested Practical List:**

Term-1

Python Programming

- Read a text file line by line and display each word separated by a #.
- Read a text file and display the number of vowels/consonants/uppercase/lowercase charactersin the file.
- Remove all the lines that contain the character 'a' in a file and write it to another file.
- Create a binary file with name and roll number. Search for a given roll number and display thename, if not found display appropriate message.
- Create a binary file with roll number, name and marks. Input a roll number and update the marks.

- Write a random number generator that generates random numbers between 1 and 6 (simulatesa dice).
- Create a CSV file by entering user-id and password, read and search the password for given user-id.

Term-2

Python Programming

- Write a Python program to implement a stack using list.

Database Management

- Create a student table and insert data. Implement the following SQL commands on the studenttable:
    - ALTER table to add new attributes / modify data type / drop attribute
    - UPDATE table to modify data
    - ORDER By to display data in ascending / descending order
    - DELETE to remove tuple(s)
    - GROUP BY and find the min, max, sum, count and average
    - Joining of two tables.
- Similar exercise may be framed for other cases.
- Integrate SQL with Python by importing suitable module.

Database Management

- Create a student table and insert data. Implement the following SQL commands on the studenttable:
    - ALTER table to add new attributes / modify data type / drop attribute
    - UPDATE table to modify data
    - ORDER By to display data in ascending / descending order
    - DELETE to remove tuple(s)
    - GROUP BY and find the min, max, sum, count and average
- Similar exercise may be framed for other cases.
- Integrate SQL with Python by importing suitable module.

2. Suggested Reading Material

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

3. Project

The aim of the class project is to create something that is tangible and useful using Python file handling/ Python-SQL connectivity. This should be done in groups of two to three students and should be started by students at least 6 months before the submission deadline. The aim here is to find a real world problemthat is worthwhile to solve.

Students are encouraged to visit local businesses and ask them about the problems that they are facing. For example, if a business is finding it hard to create invoices for filing GST claims, then students can do a project that takes the raw data (list of transactions), groups the transactions by category, accounts for the GST tax rates, and creates invoices in the appropriate format. Students can be extremely creative here. They can use a wide variety of Python libraries to create user friendly applications such as games, software for their school, software for their disabled fellow students, and mobile applications, of course to do some of these projects, some additional learning is required; this should be encouraged. Students should know how to teach themselves.

The students should be sensitised to avoid plagiarism and violations of copyright issues while working on projects. Teachers should take necessary measures for this.

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