SHIVALIK PUBLIC SCHOOL
SYLLABUS FOR CLASS –XI(SCIENCE)
SESSION: 2021-2022

SUBJECT: ENGLISH CORE
SECTION – A (20 Marks)

READING COMPREHENSION **45 Periods**

There shall be **two unseen passages (including poems)** with a variety of questions like Very Short Answer Questions, Short Answer Questions and Multiple Choice Questions, including 04 marks for vocabulary such as word formation and inferring meaning. Multiple Choice Questions(1x6=6marks), Very Short Answer Questions(1x6= 6marks), 01 Short Answer Questions(1x3=3marks), 01 Long Answer Question (1x5=5marks)

The total range of the 2 passages including a poem or a stanza, should be around 900-1000 words as per the following details:

1. The passage of 550-600 words in length will be used for note-making and summarising.
2. The passage of 350-400 words in length will be used to test comprehension, interpretation and inference.
3. An unseen poem of about 28-35 lines.

The passages as given above could be of any one of the following types:

Factual passages, e.g., illustrations, description, reports/**Discursive passages** involving opinion, e.g.,argumentative, persuasive/**Literary passages** e.g. extracts from fiction, biography, autobiography, travelogue, etc. In the case of a poem, the text may be shorter than the prescribed word limit.

SECTION B (30 Marks)

WRITING SKILLS AND GRAMMAR
Writing **60 Periods**

Short Answer Questions: Based on notice/ poster/ advertisement- **4 Marks**

Two Long Answer Questions: Letters based on verbal/visual input. – **6x2=12 Marks**
It would cover all types of letters. **Letter types may include:**

(a) business or official letters (for making enquiries, registering complaints, asking for and giving information, placing orders and sending replies)

(b) letters to the editor (giving suggestions/opinions on an issue)

(c) application for a job with a bio-data or resumé

(d) letter to the school or college authorities, regarding admissions, school issues, requirements / suitability of courses, etc.

Very Long Answer Question: Composition in the form of article/speech/report writing or a narrative-**8 Marks**

GRAMMAR (Six objective type questions) 6 Marks

Different grammatical structures in meaningful contexts will be tested. Item types will include gap filling, sentence re-ordering, dialogue completion and sentence transformation. The grammar syllabus will include determiners, tenses, clauses, modals and Change of Voice. These grammar areas will be tested through **10 Very short answer type questions on the following:**

A. Error Correction, editing tasks
B. Re - ordering of sentences,
C. Transformation of sentences

SECTION C (30 Marks)

LITERATURE 70 Periods

Questions from the following texts to test comprehension at different levels , like literal, inferential and evaluative:-

1. **Hornbill:** Textbook published by NCERT, New Delhi

Snapshots: Supplementary Reader published by NCERT, New Delhi **.**

LITERATURE 70 periods

Questions from the prescribed texts to test comprehension at different levels, like literal, inferential and evaluative will be asked.

1. Two Objective Type Questions out of three - Based on an extract from poetry to test reference to context comprehension and appreciation.– (1x2=2Marks)
2. Five Short Answer Questions out of six (3 questions should be from Hornbill) - Based on prose, poetry and plays from both the texts. (2x5=10 marks)

.-One Long Answer Question out of two from Hornbill (to be answered in120-150-words) Based on prescribed texts to test global comprehension and extrapolation-beyond the texts.-6 Marks

4.-One Long Answer Questions out of two from Snapshots (to be answered in120-150-words) -Based on theme, plot, incidents or events to test global comprehension and-extrapolation beyond the texts.-6 Marks

5. One Long Answer Question out of two from Hornbill (to be answered in120-150 words)-Based on understanding appreciation, analysis and interpretation of the characters/events/episodes/incidents .6 Marks

INTERNAL ASSESSMENT

Assessment of Listening and Speaking Skills **45 Periods**

Assessment of Listening and Speaking Skills will be for 20 marks. It is recommended that listening and speaking skills should be regularly practiced in the class.

QUESTION PAPER DESIGN 2021-22(Marks – 80+20=100)

Typology	**Testing Competencies**	**Objective Type Question Including MCQs (1 mark each)**	**Short Answer Question (2 marks) each**	**Short Answer Question (3 marks) each**	**Short Answer Question (4 marks) each**	**Long Answer Question1 80-100 words (5 marks) each**	**Long Answer Question2 120-150 wordS (6 marks) each**	**Very Long AnsweR QuestiOn 150-200 words (HOTS) (8 marks each)**	**Total marks**
Reading Comprehension	Conceptual Understanding, decoding, Analyzing, inferring, interpreting, appreciating, literary, Conventions And vocabulary, Summarizing and using Appropriate format/s	Objective Type Questions 6 MCQs 6	-						20

Writing Skill and Grammar	Reasoning, Appropriacy of style and tone, using and tone, using appropriate format and fluency, inference, analysis, evaluation and creativity	6	_						30

Literature Textbook And Supplem e Ntary Reading Text	Recalling, reasoning, appreciatin g literary convention , inference, analysis, creativity with fluency	2 From poetry extract	5	-	_	_	3	_	30
	TOTAL	**1x20=20**	**2x5=10**	**3x1=3**	**4x1=4**	**5x1=5**	**6x5=30**	**8x1=8**	**80**
Assessm e nt of Listening And Speaking Skills	-	-	-	-	-	-	-	-	**20**
	GRAND TOTAL		**-**	**-**	**-**	**-**	**-**	**-**	**100**

QUESTION PAPER DESIGN 2018-19

CLASS XI

ENGLISH CORE XI (Code No. 301) | **Time- 3 hours** | **Marks - 80+20=100**

Typology	Typology of questions/ learning Outcomes	MCQ I mark	Very Short Answer Question 1 mark	Short Answer Question 3 marks	Short Answer Question 4 marks	Long Answer- 1 80 - 100 Words 5 marks	Long Answer- 2 120-150 words 6 marks	Very Long Answer 150 – 200 words (HOTS) 10 marks	Total marks	Overall %
Reading Skills	Conceptual understanding, decoding, analysing, inferring, interpreting, appreciating ,literary conventions and vocabulary, summarising and using appropriate format/s	6	6	1	—	1	—	—	**20**	20
	Reasoning, appropriacy of style and tone, using appropriate format									

Writing Skills and Grammar	and fluency inference, analysis, evaluation and creativity, appreciation applying of languages conventions, comprehension using structures integratively, accuracy and fluency	—	10	—	1	—	1	1	**30**	30
Literary Text books And Supplementary Reader	Recalling, reasoning, appreciating a literary conventions, inference, analysis, evaluation, creativity with fluency	—	3	3	—	—	3	—	**30**	30
Assessment of Listening and Speaking Skills	Interaction, reasoning, diction, articulation, clarity, pronunciation and overall fluency	—	—	—	—	4	—	—	**20**	20
	TOTAL	**6x1=6**	**19x1=19**	**4x3=12**	**1x4=4**	**5x5=5**	**4x6=24**	**1x10=10**	**100**	**100**

Unitwise Distribution of Syllabus

Unit – 1

L. Reader : **Ch-1 The Portrait of a lady.**

(key words-revolting, serenity, seclusion, veritable, resignation, frivolous, rebukes, dilapidated, chirruping, monopoly)

S. Reader : **Ch-1- The Summer of the beautiful white horse.**

(Key words-magnificence, hallmarks, capricious, vagrant, surrey, suspicious)

Grammar : Determiners

Writing : Notice-writing, Factual Description of an event, person or incident.

Reading : Practice of unseen passage

Unit – 2

L. Reader : **Poem- A Photograph**

(Key words - paddling, transient, wry, laboured, circumstance)

Ch-2-The Address

(Key words-poignant, fleetingly, lugging, reprovingly, threatened, oppressed)

L. Reader : **Ch-2 We're Not Afraid to Die.....if We Can All Be Together**

(Key words-honing, ominous, tousled, gigantic, scrambled, sloshed, deteriorate, respite, caricatures, optimistic, expeditions, hazardous)

Writing : Report writing

Reading : Note-making

Book Review: Reading project to be submitted.

Grammar: Re –ordering – sentences

Unit – 3

L. Reader : **Ch-3 Discovering Tut..... the Saga Continues**

(Key words-forensic, scudded, resurrection, funerary, circumvented, tomography, consolidated, aftermath, demise, intriguing, speculations, eerie, constellation)

L. Reader : Ch- **Landscape of the Soul**

(Key words- Anecdote, astonished, Flanders,mooted ,conduit propounding)

Writing : Poster making, debate

Grammar: Editing and Omission

Unit – 4

S. Reader :**Ch-3 Ranga's Marriage**

(Key words-Cartographer, disgraceful, pleasantries, savoring, negotiations, suspicion)

L. Reader : **Ch-**4 **The Laburnum Top (Poetry)**

(Key words - Laburnum , goldfinch, twitching ,chirrup ,chitterlings, tremor , barred , eerie)

Reading :Practice of Unseen Passage

Writing: Letter to editor

Grammar **:** Tenses

Unit-5

S. Reader : **Ch-4 Albert Einstein at School**

(key words- expulsion, speechless, miserable, squalor, reluctantly, summoned, rebellion, accord, stalked)

L. Reader : Ch-**5 The Ailing Planet**

(Key words-holistic, ecological, sustainable, languish, ignominious, catastrophic, depletion, transcending, decimated, impoverished, precede, tenancy, voluntary)

Writing : Speech

Assessment of Speaking & Listening tests to be conducted.

Unit – 6

L. Reader : **Poem-The Voice of the Rain**

(key words-impalpable, vaguely, lave, droughts, atomies, racked)

S. Reader : **Ch-5 Mother's Day**

(Key words-dubiously, apologetically, lax, complacently, dominating, indignantly, barmy, concussion, pompous)

Grammar : Modals

Writing : Article

Reading : Note-making

Unit – 7

L. Reader : **Ch-6 The Browning Version**

(Excerpt, Slackers, Evidently, Exaggerate, Shriveled up, Frantically, Throaty)

Ch-7The Adventure

(Key words – astute , de-facto , relegated , acumen smugly , trajectory)

Grammar : Active Passive Voice

Writing : Official letters for making enquiry, Business letters for complaints, placing order and sending replies.

Unit – 8

L. Reader : **(Poem) Childhood**

(key words-Ceased, Preached)

S. Reader : **L.7. Birth**

(Key words Abruptly, Contemplation, Premonition, fret, Sordidly, Flaccid Oblivious)

Grammar : Re –ordering – sentences,Editing and Omission

Writing : Classified Advertisements

Unit – 9

L. Reader : **(Poem) Father to Son**

(Key words-Seed I spent, Prodigal, Built to my design)

S. Reader : **The Ghat of the only World**

(Key words - Malignant, imperative , poignancy, roster , conviviality)

Grammar : Clauses

Writing : Job Application, Letter to School or College Authorities.

Unit – 10

S. Reader : **Ch-8 The Tale of the Melon City.**

(Key words-Placid, Edify, Frown, Quivering, Scaffold, Amendments, Gallows Heralds)

L. Reader : **Silk Road**

(Key words- Man oeuvres , billowed ,swathe , gazelles ,veering)

Revision of entire syllabus.

Assessment of Speaking and listening skills to be conducted.

SUBJECT: MATHS

The Syllabus in the subject of Mathematics has undergone changes from time to time in accordance with growth of the subject and emerging needs of the society. Senior Secondary stage is a launching stage from where the students go either for higher academic education in Mathematics or for professional courses like Engineering, Physical and Biological science, Commerce or Computer Applications. The present revised syllabus has been designed in accordance with National Curriculum Framework 2005 and as per guidelines given in Focus Group on Teaching of Mathematics 2005 which is to meet the emerging needs of all categories of students. Motivating the topics from real life situations and other subject areas, greater emphasis has been laid on application of various concepts.

Objectives

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

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

UNIT WISE MARKS DISTRIBUTION AS PER CBSE
CLASS XI (2021-22)

ONE PAPER		**MAX MARKS 80**
NO	**UNITS**	**MARKS**
I	SETS AND FUNCTIONS	23
II	ALGEBRA	30
III	COORDINATE GEOMETRY	10
IV	CALCULUS	05
V	MATHEMATICAL REASONING	02
VI	STATISTICS AND PROBABILITY	10
	TOTAL	80
	INTERNAL ASSESSMENT	20

UNIT-I

Chapter 1 **Sets**

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

Chapter 2 **Relations & Functions**

Ordered pairs. Cartesian product of sets. Number of elements in the Cartesian product of two finite sets. Cartesian product of the set of reals with itself (upto R x R x R). 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. Sum, difference, product and quotients of functions.

UNIT-II

Chapter 3 **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 $\sin^2 x + \cos^2 x = 1$, for all x. Signs of trigonometric functions. Domain and range of trigonometric functions and their graphs. Expressing *sin (x±y)* and *cos (x±y)* in terms of sin$x$, sin$y$, cos$x$&cos$y$and their simple applications. Deducing identities like the following:

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

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

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

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

Identities related to sin2x, cos2x, tan2 x, sin3x, cos3x and tan3x. General solution of trigonometric equations of the type sin$y$= sin$a$, *cos$y$= cos$a$*and tan$y$= tan$a$.

UNIT III

Chapter 4 **Principle of Mathematical Induction**

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

Chapter 5 **Complex Numbers and Quadratic Equations**

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

UNIT IV

Chapter 6 **Linear Inequalities**

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

UNIT V

Chapter 7 **Permutations and Combinations**

Fundamental principle of counting. Factorial *n.* (n!) Permutations and combinations, derivation of Formulae for ${}^{n}P_{r}$ and ${}^{n}C_{r}$ and their connections, simple applications.

Chapter 8 **Binomial Theorem**

Historical perspective, statement and proof of the binomial theorem for positive integral indices. Pascal's triangle, General and middle term in binomial expansion, simple applications.

UNIT VI

Chapter 9 **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. Formulae for the following special sums.

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

Chapter 10 **Straight Lines**

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

UNIT VII

Chapter 11 **Conic Sections**

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

UNIT VIII

Chapter 12 **Introduction to Three-dimensional Geometry**

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

Chapter 13 **Limits and Derivatives**

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

UNIT IX

Chapter 14 **Mathematical Reasoning**

Mathematically acceptable statements. Connecting words/ phrases - consolidating the understanding of "if and only if (necessary and sufficient) condition", "implies", "and/or", "implied by", "and", "or", "there exists" and their use through variety of examples related to real life and Mathematics. Validating the statements involving the connecting words, difference among contradiction, converse and contrapositive.

UNIT X

Chapter 15 **Statistics**

Measures of Dispersion: Range, Mean deviation, variance and standard deviation of ungrouped/grouped data. Analysis of frequency distributions with equal means but different variances.

Chapter 16 **Probability**

Random experiments; outcomes, sample spaces (set representation). Events; occurrence of events, 'not', 'and' and 'or' events, exhaustive events, mutually exclusive events, Axiomatic (set theoretic) probability, connections with other theories of earlier classes. Probability of an event, probability of 'not', 'and' and 'or' events.

Prescribed Books:

1) Mathematics Textbook for Class XI, NCERT Publications

2) Mathematics Exemplar Problem for Class XI, Published by NCERT

3) Mathematics Lab Manual class XI, published by NC

INTERNAL ASSESSMENT	20 MARKS
Periodic Tests (Best 2 out of 3 tests conducted)	10 MARKS
Mathematics Activities	10 MARKS

Assessment of Activity Work:
Throughout the year any 10 activities shall be performed by the student from the activities given in the NCERT Laboratory Manual for the respective class (XI or XII) which is available on the link:
http://www.ncert.nic.in/exemplar/labmanuals.htmla record of the same may be kept by the student. An year end test on the activity may be conducted
The weightage are as under:

- The activities performed by the student throughout the year and record keeping: **5 marks**
- Assessment of the activity performed during the year end test: **3 marks**
- Viva-voce: **2 marks**

SUBJECT: PHYSICS (Code : 042)

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

Emphasis on basic conceptual understanding of the content.

Emphasis on use of SI units, symbols, nomenclature of physical quantities and formulations as per international standards.

Providing logical sequencing of units of the subject matter and proper placement of concepts with their linkage for better learning.

Reducing the curriculum load by eliminating overlapping of concepts/content within the discipline and other disciplines.

Promotion of process-skills, problem-solving abilities and applications of Physics concepts.

Besides, the syllabus also attempts to

Strengthen the concepts developed at the secondary stage to provide firm foundation for further learning in the subject.

Expose the learners to different processes used in Physics-related industrial and technological applications.

Develop process-skills and experimental, observational, manipulative, decision making and investigatory skills in the learners.

Promote problem solving abilities and creative thinking in learners.

Develop conceptual competence in the learners and make them realize and appreciate the interface of Physics with other disciplines.

PHYSICS (Code No. 042)
COURSE STRUCTURE
Class XI – 2021-2022 (Theory)

Time: 3 hrs. **Max Marks: 70**

		No. of Periods	Marks
Unit–I	Physical World and Measurement Chapter–1: Physical World Chapter–2: Units and Measurements	10	
Unit-II	Kinematics Chapter–3: Motion in a Straight Line Chapter–4: Motion in a Plane	24	
Unit–III	Laws of Motion Chapter–5: Laws of Motion	14	23
Unit–IV	Work, Energy and Power Chapter–6: Work, Energy and Power	12	
Unit–V	Motion of System of Particles and Rigid Body Chapter–7: System of Particles and Rotational Motion	18	
Unit-VI	Gravitation Chapter–8: Gravitation	12	17
Unit–VII	Properties of Bulk Matter Chapter–9: Mechanical Properties of Solids Chapter–10: Mechanical Properties of Fluids Chapter–11: Thermal Properties of Matter	24	

Unit–VIII	**Thermodynamics** **Chapter–12: Thermodynamics**	**12**	**20**
Unit–IX	**Behaviour of Perfect Gases and Kinetic Theory of Gases** **Chapter–13: Kinetic Theory**	**08**	
Unit–X	**Oscillations and Waves** **Chapter–14: Oscillations** **Chapter–15: Waves**	**26**	**10**
	Total	**160**	**70**

Unit I: Physical World and Measurement **10 Periods**

Chapter–1: Physical World

Physics-scope and excitement; nature of physical laws; Physics, technology and society.

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.

PRACTICAL: 1. To measure diameter of a small spherical/cylindrical body and to measure internal diameter and depth of a given beaker/calorimeter using Vernier Callipers and hence find its volume

2.To measure diameter of a given wire and thickness of a given sheet using screw gauge.

Unit II: Kinematics **24 Periods**

Chapter–3: Motion in a Straight Line

Frame of reference, Motion in a straight line: Position-time graph, speed and velocity.

Elementary concepts of differentiation and integration for describing motion, uniform and non- uniform motion, average speed and instantaneous velocity, uniformly accelerated motion, velocity - time and position-time graphs.

Relations for uniformly accelerated motion (graphical treatment).

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.

PRACTICAL:

3 To determine volume of an irregular lamina using screw gauge.

4 To determine radius of curvature of a given spherical surface by a spherometer.

Unit III: Laws of Motion **14 Periods**

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.

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).

PRACTICALS: 5. To determine the mass of two different objects using a beam balance.

6. To find the weight of a given body using parallelogram law of vectors.

Unit IV: Work, Energy and Power 12 Periods

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.

PRACTICAL : 7. Using a simple pendulum, plot its L-T^2 graph and use it to find the effective length of second's pendulum.

8 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.

Unit V: Motion of System of Particles and Rigid Body 18 Periods

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). Statement of parallel and perpendicular axes theorems and their applications.

PRACTICAL: 9. To study the relationship between force of limiting friction and normal reaction and to find the co- efficient of friction between a block and a horizontal surface.

Unit VI: Gravitation 12 Periods

Chapter–8: Gravitation

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

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

PRACTICAL : 10. To find the downward force, along an inclined plane, acting on a roller due to gravitational pull of the earth and study its relationship with the angle of inclination θ by plotting graph between force and sin θ.

Unit VII: Properties of Bulk Matter 24 Periods

Chapter–9: Mechanical Properties of Solids

Elastic behaviour, Stress-strain relationship, Hooke's law, Young's modulus, bulk modulus, shear modulus of rigidity, Poisson's ratio; elastic energy.

Chapter–10: Mechanical Properties of Fluids

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, thermal expansion; thermal expansion of solids, liquids and gases, anomalous expansion of water; specific heat capacity; Cp, Cv - calorimetry; change of state - latent heat capacity.

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

PRACTICAL : 11. To determine Young's modulus of elasticity of the material of a given wire.

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

Unit VIII: Thermodynamics 12 Periods

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, Heat engine and refrigerator.

PRACTICAL : 13. To study the relationship between the temperature of a hot body and time by plotting a cooling curve.

PRACTICAL: 14. To study the relation between frequency and length of a given wire under constant tension using sonometer.

PRACTICAL: 15. To study the relation between the length of a given wire and tension for constant frequency using sonometer.

Unit IX: Behaviour of Perfect Gases and Kinetic Theory of Gases 08 Periods

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 26 Periods

Chapter–14: Oscillations

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, fundamental mode and harmonics, Beats, Doppler effect.

ACTIVITIES:

1. **To make a paper scale of given least count ,eg. 0.2cm ,0.5cm.**
2. **To determine mass of a givenbody 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 observe change of state and plot a cooling curve for molten wax.**
5. **To note the change in level of liquid in a container on heating and interpret the observations.**
6. **To study the factors affecting the rate of loss of heat of a liquid.**

SYLLBUS OF PRACTICALS CLASS- XI

SESSION 2021-2022

PRACTICALS **Total Periods: 60**

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

- **Record of at least 12 Experiments [with a minimum of 6 from each section], to be performed by the students.**
- **Record of at least 6 Activities [with 3 each from section A and section B], to be performed by the students**
- **Report of the project to be carried out by the students.**

EVALUATION SCHEME

Time Allowed: Three hours **Max. Marks: 30**

Two experiments one from each section **One activity from any section**	**7+7 Marks** **3 Marks**
Practical record (experiment and activities)	**5 Marks**
Investigatory Project	**3 Marks**
Viva on experiments, activities and project	**5 Marks**
Total	**30 Marks**

SUBJECT: CHEMISTRY

Prescribed Books :

1. Chemistry Part-I, Class -XI, Published by NCERT.

2. Chemistry Part-II, class-XI, Published by NCERT.

Rationale

Senior Secondary state of school curriculum is a stage of transition from general education to content oriented courses. Therefore, there is a need to provide learners with sufficient conceptual background of Chemistry, which will make them competent to meet the challenges of academic and professional courses after the senior secondary stage.

The new and updated curriculum of chemistry is based on disciplinary approach with rigour and depth taking care that the syllabus is comparable to the international level. The knowledge related to the subject of Chemistry has undergone tremendous changes. Greater emphasis has been laid on use of new nomenclature, symbols and formulations, teaching of fundamental concepts, application of concepts in chemistry to industry/ technology, logical sequencing of units, removal of obsolete content and repetition, etc.

Objectives

The broad objectives of teaching Chemistry at Senior Secondary Stage are:

- to promote understanding of basic facts and concepts in chemistry while retaining the excitement of chemistry.

- to expose the students to various emerging new areas of chemistry and apprise them with their relevance in future studies and their application in various spheres of chemical sciences and technology.

- to develop problem solving skills in students.

- to expose the students to different processes used in industries and their technological applications.

- to acquaint students with different aspects of chemistry used in daily life.

- to develop an interest in students to study chemistry as a discipline.

COURSE STRUCTURE CLASS–XI (THEORY)

Total Periods (Theory 160 +Practical 60)

Time: 3 Hours **Total Marks 70**

Unit No.	**Title**	**No. of Periods**	**Marks**
Unit I	Some Basic Concepts of Chemistry	12	11
Unit II	Structure of Atom	14	
Unit III	Classification of Elements and Periodicity in Properties	8	04
Unit IV	Chemical Bonding and Molecular Structure	14	21
Unit V	States of Matter: Gases and Liquids	12	
Unit VI	Chemical Thermodynamics	16	
Unit VII	Equilibrium	14	
Unit VIII	Redox Reactions	6	16
Unit IX	Hydrogen	8	
Unit X	s -Block Elements	10	
Unit XI	Some p -Block Elements	14	
Unit XII	Organic Chemistry: Some basic Principles and Techniques	14	18
UnitXIII	Hydrocarbons	12	
Unit XIV	Environmental Chemistry	06	
	Total	**160**	**70**

1. No chapter wise weightage. *Care to be taken to cover all the chapters.*
2. *Suitable internal variations may be made for generating various templates keeping the overall weightage to different form of questions and typology of questions same.*

Choice(s):

There will be no overall choice in the question paper. However, 33 % internal choices will be given in all the sections.

UNIT - 1 :

Some Basics Concepts of Chemistry (12 Periods)
General Introduction: Importance and scope of chemistry. Nature of matter, laws of chemical combination, Dalton's atomic theory: concept of elements, atoms and molecules. Atomic and molecular masses, mole concept and molar mass, percentage composition, empirical and molecular formula, chemical reactions, stoichiometry and calculations based on stoichiometry.
Working Words
Significant figures, Gram molecular mass, Mole, Molarity, Molality, limiting reagent, Molecular formula, Empirical formula
Practical- Teacher will make the students familiar with various laboratory's apparatus such as volumetric apparatus, measuring cylinders, weighing balance and various laboratory's techniques.

Unit 2:
Structure of Atom (14 Periods)
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.

Working Words
Isotopes, Isobars, Isoelectronic, Electromagnetic radiations, Spectrum, Wavelength: Frequency, Velocity, Orbital, Orbit, Electronic Configuration, Quantum number.

Classification of Elements and Periodicity in Properties (8 Periods)
Modern periodic law and the present form of periodic table, periodic trends in properties of elements -atomic radii, ionic radii, inert gas radii Ionization enthalpy, electron gain enthalpy, electronegativity, valency. Nomenclature of elements with atomic number greater than 100.

Working Words
s-block, p-block, d- block, f - block, Atomic radius, Amphoteric oxide, Electronegativity, Metallic Character, Screening Effect, Penetration Effect, Ionization enthalpy.
Practical- Crystallization of impure sample of any one of the following: Alum, Copper Sulphate, Benzoic Acid.

Unit 3:
Chemical Bonding and Molecular Structure (14 Periods)
Valence electrons, ionic bond, covalent bond; bond parameters, Lewis structure, polar character of covalent bond, covalent character of ionic bond, valence bond theory, resonance, geometry of covalent molecules, VSEPR theory, concept of hybridization, involving s,p and d orbitals and shapes of some simple molecules, molecular orbital theory of homonuclear diatomic molecules (qualitative idea only), hydrogen bond.
Working Words
Lewis concept, Molecular orbital, Atomic orbitals, Hydrogen bonding, Bonding orbital, Anti bonding orbital, Hybridization, Sigma bond, Pie bond, Dipole moment, Partial ionic character, VSEPR theory, Paramagnetic, Diamagnetic, Bond Order, Bond length.
Practical- Determination of pH of some solutions obtained from fruit juices, solution of known and varied concentrations of acids, bases and salts using pH paper.

States of Matter: Gases and Liquids and solids (12 Periods)
Three states of matter, intermolecular interactions, types of bonding, melting and boiling points, role of gas laws in elucidating the concept of the molecule, Boyle's law, Charles law, Gay Lussac's law, Avogadro's law, ideal behaviour, empirical derivation of gas equation, Avogadro's number, ideal gas equation. Deviation from ideal behaviour, liquefaction of gases, critical temperature, kinetic energy and molecular speeds (elementary idea)Liquid State- vapour pressure, viscosity and surface tension (qualitative idea only, no mathematical derivations).

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, electrical and magnetic properties.

Working Words

Absolute zero , Van der waal's forces , Van der waal's constants, Compressibility factor, Vapors pressure, Surface tension, Viscosity, Gas constant. - Ferrimagnetic, Anti ferromagnetic , Diamagnetic, Paramagnetic, 13- 15 compounds, 12- 16 compounds ,Doping , Frenkel defect Schottky defect, Radius ratio , Packing efficiency, Coordination number, pseudo solids, anisotropy, unit cell, imperfections, F-centre.

Unit 4:

Equilibrium (14 Periods)

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

Working Words

Equilibrium, Physical equilibrium, Chemical equilibrium, Saturated solution, Dynamic, Dynamicity, Equilibrium constant, Dissociation, Homogeneous, Precipitation, Amphoteric substances, Conjugate acid - base pairs, Heterogeneous, Catalyst, PH, Buffer, Solubility product.

Environmental Chemistry (6 Periods)

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

Working Words

Environmental chemistry, Acid rain, Green House Effect, Green chemistry, Fog, Smoke, Mist, BOD, COD, Ozone layer depletion, Photochemical smog, Classical smog.

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

Unit 5:

Organic Chemistry - Some Basic Principles and Technique (14 Periods)

General introduction, methods of purification, qualitative and quantitative analysis, classification and IUPAC nomenclature of organic compounds. Electronic displacements in a covalent bond: inductive effect, electromeric effect, resonance and hyper conjugation. Homolytic and heterolytic fission of a covalent bond: free radicals, carbocations, carbanions, electrophiles and nucleophiles, types of organic reactions.

Working Words

Tetracovalency, Catenation, Functional groups, Homologous series, Isomerism, Heterolytic cleavage, Homolytic Cleavage,Carbocation, Carboanion, Free radical, Nucleophiles, Electrophiles, Inductive Effect, Electromeric effect, Resonance Effect, Hypercojugation, Qualitative Analysis, Quantitative Analysis, Sigma bond, Pi bond.

Practical-

(1) Preparation of standard solution of Oxalic acid.

(2) Determination of strength of a given solution of Sodium Hydroxide by titrating it against standard solution of Oxalic acid.

Unit 6:

Chemical Thermodynamics (16 Periods)

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

First law of thermodynamics -internal energy and enthalpy, heat capacity and specific heat, measurement of ΔU and ΔH, Hess's law of constant heat summation, enthalpy of bond dissociation, combustion, formation, atomization, sublimation, phase transition, ionization, solution and dilution.

Second law of Thermodynamics (brief introduction)

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

Third law of thermodynamics (brief introduction).

Working Words

Open System, Closed System, Isolated system, State Functions, Internal Energy, Isothermal Process, Adiabatic Process, Isochoric Process, Isobaric Process, Enthalpy, Specific heat capacity, Spontaneous Process, Entropy, Gibbs Free Energy.

Practical-

(1) Preparation of standard solution of Sodium Carbonate.

(2) Determination of strength of a given solution of Hydrochloric acid by titrating it against standard Sodium Carbonate solution.

Unit 7: Hydrocarbons (12 Periods)

Classification of Hydrocarbons

Aliphatic Hydrocarbons: Alkanes - Nomenclature, isomerism, conformation (ethane only), physical properties, chemical reactions including free radical mechanism of halogenation, combustion and pyrolysis.

Alkenes - Nomenclature, structure of double bond (ethene), geometrical isomerism, physical properties, methods of preparation, chemical reactions: addition of hydrogen, halogen, water, hydrogen halides (Markownikov's addition and peroxide effect), ozonolysis, oxidation, mechanism of electrophilic addition.

Alkynes - Nomenclature, structure of triple bond (ethyne), physical properties, methods of preparation, chemical reactions: acidic character of alkynes, addition reaction of - hydrogen, halogens, hydrogen halides and water.

Aromatic Hydrocarbons: Introduction, IUPAC nomenclature, benzene: resonance, aromaticity, chemical properties: mechanism of electrophilic substitution. nitration, sulphonation, halogenation, Friedel Craft's alkylation and acylation, directive influence of functional group in monosubstituted benzene. Carcinogenicity and toxicity.

Working Words

Acyclic, Aliphatic, Alicyclic, Aromatic, Alkane, Alkene, Alkyne, Combustion, Substitution, Halogenations, Sulphonation, Nitration, Addition, Oxidation, Conformational isomerism, Optical Isomerism, Ozonolysis.

Unit 8: s -Block Elements (Alkali and Alkaline Earth Metals) (10 Periods)

Group 1 and Group 2 Elements

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

Preparation and Properties of Some Important Compounds:

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

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

Working Words

Sparingly soluble, Thermal stability, Solvay process, Anomalous behavior, Diagonal relationship, Alkaline earth metals, Ionization enthalpy

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

Unit 9: Some p -Block Elements (14 Periods)

General Introduction to p - Block Elements
Group 13 Elements: General introduction, electronic configuration, occurrence, variation of properties, oxidation states, trends in chemical reactivity, anomalous properties of first element of the group, Boron - physical and chemical properties, some important compounds, Borax, Boric acid, Boron Hydrides, Aluminium: Reactions with acids and alkalies, uses.
Group 14 Elements: General introduction, electronic configuration, occurrence, variation of properties, oxidation states, trends in chemical reactivity, anomalous behaviour of first elements. Carbon-catenation, allotropic forms, physical and chemical properties; uses of some important compounds: oxides. Important compounds of Silicon and a few uses: Silicon Tetrachloride, Silicones, Silicates and Zeolites, their uses.

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, Oxides of Nitrogen(Structure only) ; Phosphorus - allotropic forms, compounds of Phosphorus: Preparation and Properties of Phosphine, Halides and Oxoacids (elementary idea only).

Working Words

Diborane, Ionization energy, Electropositive (or metallic) character, Anomalous properties, Electro negativity, Allotropes, Silicones, Silicates, Zeolites.
Practical - Determination of one anion and one cation in a given salt.
(Note: Insoluble salts excluded)

Unit 10: Redox Reaction (6 Periods)

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

Working Words
Oxidation, Reduction, Oxidation number, Oxidizing agent, Reducing agent, Standard Electrode Potential.

Hydrogen (8 Periods)

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

Working Words

Ionic hydride, Molecular hydride, Deficient hydride, Calgon, Hard water, Amphoteric, Oxidizing agent, Reducing agent.

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

PRACTICAL:

Evaluation Scheme for Examination	**Marks**
Volumetric Analysis	08
Salt Analysis	08
Content Based Experiment	06
Project Work	04
Class record and viva	04
Total	**30**

PRACTICAL SYLLABUS Total Periods:60

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 and Purification of Chemical Substances**

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

C. **Experiments based on Ph**

D. **Chemical equilibrium**

E. **Quantitative Estimation**

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.

F. **QualitativeAnalysis**

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

(Note: Insoluble salts excluded)

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

c. **PROJECTS**

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 tealeaves.
- 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.

Assessment Areas (Theory) 2021-22

(Class XI)

CHEMISTRY (043)

Time: 3 hrs. Maximum Marks: 70 Marks

EVALUATION CRITERIA	
Competency based questions (these can be in form of MCQ,case based questions,source based integrated questions or any other types)	20 %
Objective type questions	20 %
Short/long answer questions	60 %

SUBJECT: BIOLOGY

Prescribed Book : A text book of biology by NCERT

Rationale:

The present curriculum provides the students with updated concepts along with an extended exposure to contemporary areas of the subject. The curriculum also aims at emphasizing the underlying principles that are common to animals, plants and microorganisms as well as highlighting the relationship of Biology with other areas of knowledge. The format of the curriculum allows a simple, clear, sequential flow of concepts. It relates the study of biology to real life through the use of technology. It links the discoveries and innovations in biology to everyday life such as environment, industry, health and agriculture. The updated curriculum focuses on understanding and application of scientific principles, while ensuring that ample opportunities and scope for learning and appreciating basic concepts continue to be available within its framework.

Objectives of teaching Biology

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

It is expected that the students would get an exposure to various branches of Biology in the curriculum in a more contextual and systematic manner as they study its various units.

COURSE STRUCTURE
CLASS XI (2021 -22) (THEORY)

Time: 3 Hours **Max. Marks: 70**

Unit	Title	No. of Periods	Marks
I	Diversity of Living Organisms	27	12
II	Structural Organization in Plants and Animals	27	12
III	Cell: Structure and Function	26	12
IV	Plant Physiology	40	17
V	Human Physiology	40	17
	Total	**160**	**70**

PRACTICALS

Time allowed: 3 Hours **Max. Marks: 30**

Evaluation Scheme	
One Major Experiment Part A	5 Marks
One Minor Experiment Part A	4 Marks
Slide Preparation Part A	5 Marks
Spotting	7 Marks
Practical Record+Viva Voce	4 Marks
Project Record + Viva Voce	5 Marks
Total	30 Marks

Assessment Areas (Theory)
2021-22 Class XI
Biology (044)

Time : 3 hrs. **Maximum Marks: 70**
Marks

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

QUESTION WISE BREAK UP
SUMMATIVE ASSESMENT

Type of Question	Mark(s) per Question	Total No. of Questions	Total Marks
VSA	**1**	**14**	**14**
Case based Questions	**4**	**02**	**08**
SA-I	**2**	**09**	**18**
SA-II	**3**	**05**	**15**
LA	**5**	**03**	**15**
Total		**33**	**70**

FORMATIVE ASSESMENT

Type of Question	Mark(s) per Question	Total No. of Questions	Total Marks
VSA	**1**	**05**	**05**
Case Based Questions	**4**	**01**	**04**
SA-I	**2**	**04**	**08**
SA-II	**3**	**01**	**03**
LA	**5**	**01**	**05**
Total		**12**	**25**

QUESTION WISE BREAK UP

- Typology of questions: VSA including MCQs, Assertion – Reasoning type questions; SA; LA-I; LA-II; Source-based/ Case-based/ Passage-based/ Integrated assessment questions.

- An internal choice of approximately 33% would be provided.

Suggestive verbs for various competencies

- **Demonstrate, Knowledge andUnderstanding**
  State, name, list, identify, define, suggest, describe, outline, summarize, etc.
- **Application ofKnowledge/Concepts**
  Calculate, illustrate, show, adapt, explain, distinguish, etc.
- **Analyze, Evaluate and Create**
  Interpret, analyse, compare, contrast, examine, evaluate, discuss, construct, etc.

UNIT WISE SYLLABUS

Unit-1 **(Marks-5)** **(Period – 12)**

- **Living world**

Key Words: Biodiversity, Flora, Fauna, Classification Taxonomy, Taxon, Nomenclature, Herbarium, Species.

What is living? biodiversity; need for classification;three domains of life; taxonomy & systematics; concept of species and taxonomical hierarchy; binomial nomenclature; tools for study of taxonomy-museums, zoological parks, herbaria, botanical gardens.

- **Biological Classification**

Key Words : Classification, Monera, Lichens, Mycorrhiza Symbiosis, Phycobiont, Mycobiont, Retrovirus, Viroids.

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

Practicals :

- Study parts of a compound microscope.

Unit-2 **(Marks-7)** **(Period - 15)**

- **Plant Kingdom**

Key Words : Chlorophyceae, Phaeophyceae, Rhodophyceae, Peat moss, Sporophylls, Antheridium, Archegonium.

Salient features and classification of plants into major groups-Algae, Bryophyta, Pteridophyta, Gymnospermae and Angiospermae (three to

five salient and distinguising features and at least two examples of each category); Angiosperms-classification up to class, characteristics features and examples

- **Animal Kingdom**

Key Words : Chordates, Non chrodates, Vertebrates, Invertebrate Symmetry, coelom, Metameric segmentation, Oviparous, Viviparous.

Salient features and classification of animals non chordates up to phyla level and chordates up to classes level (three to five salient features and at least two examples)

Practicals:

1. Study of the specimens/slides/models and identification with reasons Bacteria, Oscillatoria, Spirogyra, Rhizopus, mushroom, yeast, liverwort, moss, fern, pine, one monocotyledonous plant and one dicotyledonous plant and one lichen.
2. Study of specimens/slides/ models and identification with reasons- Amoeba, Hydra, liverfluke, Ascaris, leech, earthworm, prawn, silkworm, honeybee, snail, starfish, shark rohu, frog, lizard, pigeon and rabbit.

Unit-3 (Marks-12) (Period - 18)

- **Morphology of flowering plants**
- **Anatomy of flowering plants**

Key Words : Morphology, Anatomy, Parenchyma, Collechyma Sclerenchyma, Meristem, Vascular bunddle, Exarch, Endarch Cork Cambium, Spring wood, Autum wood, Bark.

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

Practicals :

1. Study and describe three locally available common flowering plants, one from each of the families Solanaceae,Fabacceae and Liliaceae including dissection and display of floral whorls and

anther and ovary to show number of chambers. Types of root (Tap and adventitious); stem (herbaceous and woody); leaf (arrangement, shape, venation, simple and compound)

2. Preparation and study of T.S. of dicot and monocot roots and stems (primary).
3. Study of distribution of stomata in the upper and lower surface of leaves.
4. Study of different modification is root, stem and leaves.
5. Study and identification of different types of inflorescence (cymose and racemose)

Unit-4 (Marks-8) (Period - 15)

- **Structural Organisation in Animals**

Key Words : Tissues, Muscles, Striated and Non striated muscles cordiac muscles, Neuron, compound eyes, ommatidium.

Animal tissues; morphology, anatomy and functions of different systems (digestive, circulatory, respiratory, nervous and reproductive) of an insect (cockroach). (a brief account only)

- **Cell, the unit of life**

Key Words : Prokaryotic and Eukaryotic cell, cytoplasm Middle lamella, cytoskeleton, Semiautonomous, Autophagosome chromosome, chromatids, centromere.

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

PRACTICALS;

1. Study of tissues and diversity in shapes and sizes of plant and animal cells (palisade cells, guard cells, parenchyma, collenchyma, sclerenchyma, xylem, phloem, squamous epithelium, muscle fibers

and mammalian blood smear) through temporary/permanent slides.

2. Study of external morphology of cockroach through specimens/models.

Unit-5 (Marks-8) (Period - 20)

- **Biomolecules**

Key Words : Biomolecules, Macromolecules, Micromolecules, Saccharides, Polypetide, Nucleic acids, Enzymes, Activation energy, cofactors.

Chemical constituents of living cells; biomelecules, structure and function of proteins, carbodydrates, lipids, nucleic acids, enzymes, types, properties, enzyme action.

- **Cell cycle and cell division.**

Key Words : Cell division, Equational division, Reductional division, Spindle apparatus, Karyokinesis, cytokinesis.

Cell division: cell cycle, mitosis, meiosis and their significance.

Practical :

Study of mitosis in onion root tip cells and animals cells (grashopper) from permanent slides.

- Test for the presence of sugar, starch, proteins and fats. To detect these in suitable plant and animal materials.
- Separation of plant pigments through paper chromatography

Unit-6 (Marks-07) (Period - 18)

- **Transport in Plants**

Key Words : Diffusion, Osmosis, Imbibition, Plasmolysis, Apoplast, Symplast Plasmodesmata, Transpiration, Guttation.

Transport in plats; movement of water, gases and nutrients;cell to cell transport, Diffusion, facilitated diffusion, active transport; plant-water relations, Imbibition, water potential, osmosis, plasmolysis, long

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

- **Mineral Nutrition**

Key Words : Nutrition, Macro and Micronutrients, Hydroponics, N_2 Fixation Essential elements.

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

Practicals:

1. Study of osmosis by potato osmometer.
2. Study of plasmolysis in epidermal peels (e.g. Rhoeo leaves)
3. Comparative study of the rates of transpiration in the upper and lower surface of leaves.
4. Study of imbibition of seeds/raisins.

Unit-7 (Marks-10) (Period - 22)

- **Photosynthesis in Higher Plants**

Key Words : Photosynthesis, Photosystem, Photophosphorylation, Kranz anatomy, chemiosmotic hypothesis.

Photosynthesis: 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_3 and C_4 pathways; factors affecting photosynthesis.

- **Respiration**

Key Words : Aerobic and Anaerobic respiration, Fermentation Glycolysis, Amphibolic, Respiratory quotient.

Respiration: 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.

- **Plant growth and development**

Key Words : Growth development, Differentiation, Hormones, Inhibitors Stress hormone, Dormancy, Vernalisation, Photoperiodism.

Plant growth and development: seed germination; phases of plant growth and plant growth rate; conditions of growth; differentation, dedifferentiation and redifferentiation; sequence of developmental processes in a plant cell; growth regulators-auxin, gibberellin, cytokinin, ethylene, ABA; seed dormancy; vernalisation; photoperodism.

Practicals:

1. To study the rate of respiration of lower buds/leaf tissue and germinating seeds.
2. Observation and comments on the experimental set up for showing:
    a. Anaerobic respiration
    b. Phototropism
    c. Apical bud removal
    d. Suction due to transpiration

Unit-8 (Marks-5) (Period - 13)

- **Digestion and Absorption**

Key Words : Digestion, Diphyodont, Glands, Peristalsis, Chyme, absorption, assimilation, egestion, Diarrhoea.

Digestion and absorption: alimentary canal and digestive glands, role of digestive enzymes and gastrointestinal hormones; Peristalsis, digestion,

absorption and assimilation of proteins, carbohydrates and fats; calorific values of proteins, carbohydrates and fats; egestion; nutritional and digestive disorders-PEM, indigestion, consipation, vomiing, jaundice, diarrhoea.

- **Breathing and Exchange of Gases**

Key Words : Breathing, Respiration, Trachea, Alveoli, Tidal volume, Residual volume, Total lung capacity.

Breathing and Respiratory: 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.

Unit-9 (Marks-5) (Period - 12)

- **Body Fluids and Circulation**

Key Words : Circulation, Coagulation, Value, Heart beat, cardiac cycle, stroke volume, Heart sounds.

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 diseases, angina pectoris, heart failure.

- **Excretion**

Key Words : Excretion, Osmoregulation, Malpighian body, Malpighian tubule, Nephron, Amonotelism, Ureotelism and Uricotelism, Haemodialysis.

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

Praticals:

1. To test the presence of urea in urine.
2. To detect the presence of albumin in urine.
3. To detect the presence of bile salts in urine.
4. To detect the presence of sugar in urine.

Unit-10 (Marks-7) (Period - 15)

- **Locomotion and Movement**

Key Words : Locomotion, Movement, Skeletal Muscle, Smooth muscle Myofibril, Sacromere, Sacroplasmic reticulum, Tetanus, Arthritis

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

- **Neural Control and Coordination**

Key Words : Neuron, Resting potential, Action potential, Polarised, Depolarised, Impulse, Reflex action, Sensory and motor neuron, Blind spot, yellow spot, Rods and cones.

Neural control and coordination:neuron and nerves; Nervous system in humans-central nervous system: peripheral nervous system and visceral nervous system; generation and conduction of nerve impulse; reflex action; sensory perception; sense organs; elementary structure and function of eye and ear.

- **Chemical Coordination and Integration**

Key Words: Endocrine gland, Exocrine gland, Hormone, Hyperglycemia, Hypoglycemia, Diabetes, Testes, Ovary.

Chemical coordination and regulation:endocrine glands and hormones: human endocrine system-hypothalamus, pituitary, pineal, parathyroid, adrenal, pancreas, gonads;

Practical

1. Study of human skeleton and different types of joints.

SUBJECT: PHYSICAL EDUCATION

THEORY **Max. Marks 70**

Unit I: Changing Trends & Career in Physical Education

- Meaning & definition of Physical Education
- Aims & Objectives of Physical Education
- Career Options in Physical Education
- Competitions in various sports at national and international level
- Khelo-India Program

PRACTICAL-General fitness- warming up and cooling down.

Unit II: Olympic Value Education

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

PRACTICAL- General fitness- jogging, stretching exercises.

Unit III Physical Fitness, Wellness & Lifestyle

- Meaning & Importance of Physical Fitness, Wellness & Lifestyle
- Components of physical fitness and Wellness
- Components of Health related fitness

PRACTICAL- Sprint,continues running

Unit IV: Physical Education & Sports for CWSN (Children with Special Needs- Divyang)

- Aims & objectives of Adaptive Physical Education
- Organization promoting Adaptive Sports (Special Olympics Bharat; Paralympics; Deaflympics)
- Concept of Inclusion, its need and Implementation
- Role of various professionals for children with special needs (Counsellor, Occupational Therapist, Physiotherapist, Physical Education Teacher, Speech Therapist & special Educator)

PRACTICAL- Throw ball, sit and reach test

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)
- Relaxation Techniques for improving concentration – Yog-nidra

PRACTICAL-Practice of Yoga asana

Unit VI: Physical Activity & Leadership Training

- Leadership Qualities & Role of a Leader
- Creating leaders through Physical Education
- Meaning, objectives & types of Adventure Sports (Rock Climbing, trekking, River Rafting, Mountaineering, Surfing and Para Gliding)
- Safety measures to prevent sports injuries

PRACTICAL-Practices of different types of Asana. Game-Volleyball

Unit VII: Test, Measurement & Evaluation

- Define Test, Measurement & Evaluation
- Importance of Test, Measurement & Evaluation in Sports
- Calculation of BMI & Waist - Hip Ratio
- Somato Types (Endomorphy, Mesomorphy & Ectomorphy)
- Measurement of health related fitness

PRACTICAL-Broad jump, Game-Volleyball-fundamental skills of Volleyball and dimension, rules and regulations.

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
- Properties and Functions of Muscles
- Function & Structure of Respiratory System and Circulatory System
- Equilibrium – Dynamic & Static and Centre of Gravity and its application in sports

PRACTICAL-Game-Badminton-fundamental skills

Unit IX: Psychology & Sports

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

PRACTICAL-Game-Badminton-dimension, rules of the game

Unit X: Training and Doping in Sports

- Meaning & Concept of Sports Training
- Principles of Sports Training
- Warming up & limbering down
- Skill, Technique & Style
- Concept & classification of doping
- Prohibited Substances & their side effects
- dealing with alcohol and substance abuse

PRACTICAL- Practice of skill of the game

PRACTICAL **Max. Marks 30**

01. Physical Fitness Test - 6 Marks
02. Proficiency in Games and Sports (Skill of any one Game of choice from the given list*) - 7 Marks
03. Yogic Practices - 7 Marks
04. Record File ** - 5 Marks
05. Viva Voce (Health/ Games & Sports/ Yoga) - 5 Marks

* Athletics, Archery, Badminton, Boxing, Chess, Judo, Shooting, Skating, Swimming, Taekwondo, Tennis, Aerobics, Gymastics, Rope-Skipping, Yoga, Bocce & Unified Basketball [CWSN (Children With Special Needs – Divyang)]

****Record File shall include:**

Practical-1: Labelled diagram of 400 M Track & Field with computations.
Practical-2: Computation of BMI from family or neighbourhood & graphical representation of the data.
Practical-3: Labelled diagram of field & equipment of any one game of your choice out of the above list.
Practical-4: List of current National Awardees (Dronacharya Award, Arjuna Award & Rajiv Gandhi Khel Ratna Award)
Practical-5: Pictorial presentation of any five Asanas for improving concentration.