

**English Core**  
**Code No. 301**  
**Class XI (2021-22)**  
**Term Wise Syllabus**

| SECTION | TERM I                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | WEIGHTAGE<br>(IN MARKS)                                        | TERM II                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | WEIGHTAGE<br>(IN MARKS)                                        |
|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------|
| A       | <b>Reading Comprehension:</b> <ul style="list-style-type: none"> <li>Unseen passage (factual, descriptive or literary/ discursive or persuasive)</li> <li>Case Based Unseen (Factual) Passage</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 8<br>+<br>5<br>= 13                                            | <b>Reading Comprehension:</b> <ul style="list-style-type: none"> <li>Unseen passage (factual, descriptive or literary /discursive or persuasive)</li> <li>Unseen passage for Note Making and Summarising</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                 | 8<br>+<br>5<br>= 13                                            |
| B       | <b>Creative Writing Skills and Grammar:</b><br><br><u>Short Writing Tasks</u> <ul style="list-style-type: none"> <li>Notice Writing</li> </ul><br><u>Long Writing Tasks</u> <ul style="list-style-type: none"> <li>Business or Official Letters( Making enquiries, registering complaints, asking for or giving information, placing orders and sending replies)</li> <li>Speech</li> </ul><br><u>Grammar</u> <ul style="list-style-type: none"> <li>Determiners</li> <li>Tenses</li> <li>Re-ordering of Sentences</li> </ul><br>{MCQs on Gap filling/ Transformation of Sentences}                                                                                                                                                                                                                                                  | 3<br><br>+<br>5<br>+<br><br>4<br><br>= 12                      | <b>Creative Writing Skills and Grammar:</b><br><br><u>Short Writing Tasks</u> <ul style="list-style-type: none"> <li>Posters</li> </ul><br><u>Long Writing Tasks</u> <ul style="list-style-type: none"> <li>Official Letters: e.g. to school/college authorities (regarding admissions, school issues, requirements / suitability of courses)</li> <li>Debate</li> </ul><br><u>Grammar</u> <ul style="list-style-type: none"> <li>Determiners</li> <li>Tenses</li> <li>Re-ordering of Sentences</li> </ul><br>{MCQs on Gap filling/ Transformation of Sentences }                                                                   | 3<br><br>+<br>5<br>+<br><br>4<br><br>= 12                      |
| C       | <b>Literature:</b><br>Literary-prose/poetry extracts ( seen- texts ) comprehension and appreciation. <b>(Two Extracts)</b><br><b>Questions Based on Texts to assess</b> comprehension and appreciation, analysis, inference, extrapolation<br><br><u>Book-Hornbill:</u> <ul style="list-style-type: none"> <li>The Portrait of a Lady (<i>Prose</i>)</li> <li>A Photograph (<i>Poem</i>)</li> <li>"We're Not Afraid to Die... if We Can All Be Together" (<i>Prose</i>)</li> <li>Discovering Tut: the Saga Continues</li> <li>The Laburnum Top (<i>Poem</i>)</li> <li>Landscape of the Soul (<i>Prose</i>)</li> </ul><br><u>Book-Snapshots:</u> <ul style="list-style-type: none"> <li>The Summer of the Beautiful White Horse(<i>Prose</i>)</li> <li>The Address (<i>Prose</i>)</li> <li>Ranga's Marriage (<i>Prose</i>)</li> </ul> | <b>9 Marks for Hornbill + 6 Marks for Snapshots = 15 Marks</b> | <b>Literature:</b><br>Questions based on extracts/texts to assess comprehension and appreciation, analysis, inference, extrapolation<br><br><u>Book-Hornbill:</u> <ul style="list-style-type: none"> <li>The Voice of the Rain (<i>Poem</i>)</li> <li>The Ailing Planet: The Green Movement's Role (<i>Prose</i>)</li> <li>The Browning Version( <i>Play</i>)</li> <li>Childhood (<i>Poem</i>)</li> <li>Silk Road (<i>Prose</i>)</li> </ul><br><u>Book-Snapshots:</u> <ul style="list-style-type: none"> <li>Albert Einstein at School (<i>Prose</i>)</li> <li>Mother's Day (<i>Play</i>)</li> <li>Birth ( <i>Prose</i>)</li> </ul> | <b>9 Marks for Hornbill + 6 Marks for Snapshots = 15 Marks</b> |
|         | <b>TOTAL</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>40</b>                                                      | <b>TOTAL</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>40</b>                                                      |
|         | <b>ASL</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <b>10</b>                                                      | <b>ASL</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <b>10</b>                                                      |
|         | <b>GRAND TOTAL</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <b>40 + 10 = 50 MARKS</b>                                      | <b>GRAND TOTAL</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <b>40 + 10 = 50 MARKS</b>                                      |

**PHYSICS XI (Code No. 042) COURSE STRUCTURE**  
**Class XI (Theory) Term 1**

**Time: one and half hours.**

**Max Marks: 35**

|                 |                                                      | <b>No. of Periods</b> | <b>Marks</b> |
|-----------------|------------------------------------------------------|-----------------------|--------------|
| <b>Unit-I</b>   | <b>Physical World and Measurement</b>                | <b>6</b>              | <b>20</b>    |
|                 | Chapter-1: Physical World                            |                       |              |
|                 | Chapter-2: Units and Measurements                    |                       |              |
| <b>Unit-II</b>  | <b>Kinematics</b>                                    | <b>16</b>             |              |
|                 | Chapter-3: Motion in a Straight Line                 |                       |              |
|                 | Chapter-4: Motion in a Plane                         |                       |              |
| <b>Unit-III</b> | <b>Laws of Motion</b>                                | <b>10</b>             | <b>15</b>    |
|                 | Chapter-5: Laws of Motion                            |                       |              |
| <b>Unit-IV</b>  | <b>Work, Energy and Power</b>                        | <b>12</b>             |              |
|                 | Chapter-6: Work, Energy and Power                    |                       |              |
| <b>Unit-V</b>   | <b>Motion of System of Particles and Rigid Body</b>  | <b>16</b>             |              |
|                 | Chapter-7: System of Particles and Rotational Motion |                       |              |
| <b>Unit-VI</b>  | <b>Gravitation</b>                                   | <b>8</b>              |              |
|                 | Chapter-8: Gravitation                               |                       |              |
| <b>Total</b>    |                                                      | <b>68</b>             | <b>35</b>    |

**Syllabus assigned for first term**

**Unit I: Physical World and Measurement**

**6 Periods**

**Chapter-1: Physical World**

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

**Chapter-2: Units and Measurements**

Need for measurement: Units of measurement; systems of units; SI units, fundamental and derived units. Length, mass and time measurements; accuracy and precision of measuring instruments; errors in measurement; significant figures.

Dimensions of physical quantities, dimensional analysis and its applications.

**Unit II: Kinematics**

**16 Periods**

**Chapter-3: Motion in a Straight Line**

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

Relations for uniformly accelerated motion (graphical treatment).

**Chapter-4: Motion in a Plane**

Scalar and vector quantities; position and displacement vectors, general vectors and their notations; equality of vectors, multiplication of vectors by a real number; addition and subtraction of vectors,

relative velocity, Unit vector; resolution of a vector in a plane, rectangular components, Scalar and Vector product of vectors.

Motion in a plane, cases of uniform velocity and uniform acceleration-projectile motion, uniform circular motion.

### **Unit III: Laws of Motion**

**10 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. (Recapitulation only)*

Law of conservation of linear momentum and its applications.

Equilibrium of concurrent forces, Static and kinetic friction, laws of friction, rolling friction, lubrication.

Dynamics of uniform circular motion: Centripetal force, examples of circular motion (vehicle on a level circular road, vehicle on a banked road).

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

**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.

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

**16 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).

### **Unit VI: Gravitation**

**8 Periods**

#### **Chapter–8: Gravitation**

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

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

## Class XI (Theory) Term II

Time: 2hrs

Max Marks: 35

| Unit      |                                                        | Periods | Marks |
|-----------|--------------------------------------------------------|---------|-------|
| Unit–VII  | Properties of Bulk Matter                              | 22      | 23    |
|           | Chapter–9: Mechanical Properties of Solids             |         |       |
|           | Chapter–10: Mechanical Properties of Fluids            |         |       |
|           | Chapter–11: Thermal Properties of Matter               |         |       |
| Unit–VIII | Thermodynamics                                         | 10      |       |
|           | Chapter–12: Thermodynamics                             |         |       |
| Unit–IX   | Behaviour of Perfect Gases and Kinetic Theory of Gases | 08      |       |
|           | Chapter–13: Kinetic Theory                             |         |       |
| Unit–X    | Oscillations and Waves                                 | 23      | 12    |
|           | Chapter–14: Oscillations                               |         |       |
|           | Chapter–15: Waves                                      |         |       |
|           | Total Marks                                            | 63      | 35    |

### Syllabus assigned for Term II

**Unit VII: Properties of Bulk Matter**

**22 Periods**

#### **Chapter–9: Mechanical Properties of Solids**

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

#### **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, (recapitulation only)* thermal expansion; thermal expansion of solids, liquids and gases, anomalous expansion of water; specific heat capacity;  $C_p$ ,  $C_v$  - calorimetry; change of state - latent heat capacity.

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

## **Unit VIII: Thermodynamics**

**10 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

## **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**

**23 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, Beats

## PRACTICALS

### Syllabus for TERM I

**Total Periods: 16**

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

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

Record of at least 3 Activities [with 3 each from section A and section B], to be demonstrated by teacher.

**Time Allowed: One and half hours**

**Max. Marks: 30**

|                                              |                 |
|----------------------------------------------|-----------------|
| Two experiments one from each section        | <b>8Marks</b>   |
| Practical record (experiment and activities) | 2Marks          |
| Viva on experiments, and activities          | <b>5 Marks</b>  |
| <b>Total</b>                                 | <b>15 Marks</b> |

### Syllabus assigned for Practical Term I

#### Experiments

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

**OR**

To determine volume of an irregular lamina using screw gauge.

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

**OR**

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

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

**OR**

To find the downward force, along an inclined plane, acting on a roller due to gravitational pull of the earth and study its relationship with the angle of inclination  $\theta$  by plotting graph between

force and  $\sin \theta$ .

### Activities

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

### Class XI Syllabus for TERM II

**Total Periods: 16**

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

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

Record of at least 3 Activities [with 3 each from section A and section B], to be demonstrated by teacher.

**Time Allowed: One and half hours**

**Max. Marks: 30**

|                                              |                 |
|----------------------------------------------|-----------------|
| Two experiments one from each section        | <b>8Marks</b>   |
| Practical record (experiment and activities) | 2Marks          |
| Viva on experiments, and activities          | <b>5 Marks</b>  |
| <b>Total</b>                                 | <b>15 Marks</b> |

### Experiments

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

**OR**

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

2. To study the variation in volume with pressure for a sample of air at constant temperature by plotting graphs between P and V, and between P and  $1/V$ .
3. To determine the surface tension of water by capillary rise method.

**OR**

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

4. To study the relationship between the temperature of a hot body and time by plotting a cooling curve.
5. To determine specific heat capacity of a given solid by method of mixtures.
6. To study the relation between frequency and length of a given wire under constant tension using sonometer.

**OR**

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

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

**Activities**

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

**Practical Examination for Visually Impaired Students Class XI**

**Note:** Same Evaluation scheme and general guidelines for visually impaired students as given for Class XII may be followed.

**A. Items for Identification/Familiarity of the apparatus for assessment in practicals (All experiments)**

Spherical ball, Cylindrical objects, vernier calipers, beaker, calorimeter, Screw gauge, wire, Beam balance, spring balance, weight box, gram and milligram weights, forceps, Parallelogram law of vectors apparatus, pulleys and pans used in the same 'weights' used, Bob and string used in a simple pendulum, meter scale, split cork, suspension arrangement, stop clock/stop watch, Helical spring, suspension arrangement used, weights, arrangement used for measuring extension, Sonometer, Wedges, pan and pulley used in it, 'weights' Tuning Fork, Meter scale, Beam balance, Weight box, gram and milligram weights, forceps, Resonance Tube, Tuning Fork, Meter scale, Flask/Beaker used for adding water.

**B. List of Practical's**

1. To measure diameter of a small spherical/cylindrical body using vernier calipers.
2. To measure the internal diameter and depth of a given beaker/calorimeter using vernier calipers and hence find its volume.
3. To measure diameter of given wire using screw gauge.
4. To measure thickness of a given sheet using screw gauge.
5. To determine the mass of a given object using a beam balance.
6. To find the weight of given body using the parallelogram law of vectors.
7. Using a simple pendulum plot  $L-T$  and  $L-T^2$  graphs. Hence find the effective length of second's pendulum using appropriate length values.
8. To find the force constant of given helical spring by plotting a graph between load and extension.
9. (i) To study the relation between frequency and length of a given wire under constant tension using a sonometer.  
(ii) To study the relation between the length of a given wire and tension, for constant frequency, using a sonometer.
10. To find the speed of sound in air, at room temperature, using a resonance tube, by observing the two resonance positions.

**Note:** The above practicals may be carried out in an experiential manner rather than recording observations.

**Prescribed Books:**

1. Physics Part-I, Textbook for Class XI, Published by NCERT
2. Physics Part-II, Textbook for Class XI, Published by NCERT
3. Laboratory Manual of Physics, Class XI Published by NCERT
4. The list of other related books and manuals brought out by NCERT  
(consider multimedia also).

## CHEMISTRY (043)

### SYLLABUS FOR SESSION 2021-22 CLASS XI Term-I

| S | UNIT                                                     | Periods | Marks |
|---|----------------------------------------------------------|---------|-------|
| 1 | Some Basic Concepts of Chemistry                         | 10      | 11    |
| 2 | Structure of Atom                                        | 12      |       |
| 3 | Classification of Elements and Periodicity in Properties | 6       | 4     |
| 4 | Chemical Bonding and Molecular Structure                 | 14      | 6     |
| 5 | Redox Reactions                                          | 4       | 5     |
| 6 | Hydrogen                                                 | 4       |       |
| 7 | Organic Chemistry: Some basic Principles and Techniques  | 10      | 9     |
|   | TOTAL                                                    | 60      | 35    |

**Some Basic Concepts of Chemistry:** General Introduction: Importance and scope of Chemistry. Atomic and molecular masses, mole concept and molar mass, percentage composition, empirical and molecular formula, chemical reactions, stoichiometry and calculations based on stoichiometry.

**Structure of Atom:** 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

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

**Chemical Bonding and Molecular Structure:**

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

**Redox Reactions:**

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

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

**Organic Chemistry: Some basic Principles and Techniques:** General introduction, classification and IUPAC nomenclature of organic compounds. Electronic displacements in a covalent bond: inductive effect, electromeric effect, resonance and hyper conjugation. Homolytic and heterolytic fission of a covalent bond: free radicals, carbocations, carbanions, electrophiles and nucleophiles, types of organic reactions.

## PRACTICALS

**Term I: A 15-mark Practical** would be conducted under the supervision of subject teacher. This would contribute to the overall practical marks for the subject.

**OR**

In case the situation of lockdown continues until Nov-Dec 2021, a *Practical Based Assessment (pen-paper)* of 15 marks would be conducted at the end of Term I.

### Term-I Evaluation Scheme

| S. No | Practical                                 | Marks |
|-------|-------------------------------------------|-------|
| 1.    | Volumetric Analysis                       | 8     |
| 2.    | Content Based experiment                  | 2     |
| 3.    | Class record and viva (Internal Examiner) | 5     |
| TOTAL |                                           | 15    |

**Micro-chemical methods are available for several of the practical experiments, wherever possible such techniques should be used.**

#### A. Basic Laboratory Techniques

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

#### B. Characterization of Chemical Substances (2 Marks)

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

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

- i. Using a mechanical balance/electronic balance.
- ii. Preparation of standard solution of Oxalic acid.
- iii. Determination of strength of a given solution of Sodium hydroxide by titrating it against standard solution of Oxalic acid.
- iv. Preparation of standard solution of Sodium carbonate.
- v. Determination of strength of a given solution of hydrochloric acid by titrating it against standard Sodium Carbonate solution.

### SYLLABUS FOR SESSION 2021-22 CLASS XI Term-II

| S.No | UNIT                                | Periods | Marks |
|------|-------------------------------------|---------|-------|
| 1    | States of Matter: Gases and Liquids | 9       | 15    |
| 2    | Chemical Thermodynamics             | 14      |       |
| 3    | Equilibrium                         | 12      |       |
| 4    | s -Block Elements                   | 5       | 11    |
| 5    | Some p -Block Elements              | 9       |       |
| 6    | Hydrocarbons                        | 10      | 9     |
|      | TOTAL                               | 59      | 35    |

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

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

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

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

Third law of thermodynamics (brief introduction).

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

**s -Block Elements:** 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.

**Some p -Block Elements:** General Introduction to p -Block Elements

Group 13 Elements: General introduction, electronic configuration, occurrence, variation of properties, oxidation states, trends in chemical reactivity, anomalous properties of first element of the group, Boron - physical and chemical properties.

Group 14 Elements: General introduction, electronic configuration, occurrence, variation of properties, oxidation states, trends in chemical reactivity, anomalous behaviour of first elements. Carbon-catenation, allotropic forms, physical and chemical properties.

**Hydrocarbons:** Classification of Hydrocarbons Aliphatic Hydrocarbons:

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

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

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

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

## PRACTICALS

**Term II:** At the end of Term II, a **15-mark Practical** would be conducted under the supervision of subject teacher. This would contribute to the overall practical marks for the subject.

### OR

In case the situation of lockdown continues beyond December 2021, a *Practical Based Assessment (pen-paper)* of 10 marks and Viva 5 marks would be conducted at the end of Term II by the subject teacher. This would contribute to the overall practical marks for the subject.

### TERM-II Evaluation Scheme

| S. No | Practical                       | Marks |
|-------|---------------------------------|-------|
| 1.    | Salt Analysis                   | 8     |
| 2.    | Content Based Experiment        | 2     |
| 3     | Project Work and Viva(Internal) | 5     |
| TOTAL |                                 | 15    |

#### A. Qualitative Analysis(Marks 8)

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

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

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

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

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

PROJECTS scientific investigations involving laboratory testing and collecting information from other sources.

#### Guidelines on Syllabus for Visually Handicapped students.

Schools are expected to rationalise and divide the syllabus of practicums for visually handicapped students into two halves on the basis of collective guidelines given for the same in the complete syllabus and as per the convenience of their students. This flexibility is given in view of the special

condition of visually handicapped students .They will, however, be assessed on 15 marks in practical examination in both the terms as rest of their peers.

#### SYLLABUS FOR SESSION 2021-22 CLASS XII Term-I

| S.No | UNIT                         | Periods | MARKS |
|------|------------------------------|---------|-------|
| 1    | Solid State                  | 8       | 10    |
| 2    | Solutions                    | 8       |       |
| 3    | p-Block Elements             | 7       | 10    |
| 4    | Haloalkanes and Haloarenes   | 9       | 15    |
| 5    | Alcohols, Phenols and Ethers | 9       |       |
| 6    | Biomolecules                 | 8       |       |
|      | TOTAL                        | 49      | 35    |

**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.

**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.

**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.

**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).

**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, electrophilic substitution reactions, uses of phenols.

Ethers: Nomenclature, methods of preparation, physical and chemical properties, uses.

**Biomolecules: Carbohydrates** - Classification (aldoses and ketoses), monosaccharides (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

**Term I: A 15-mark Practical** would be conducted under the supervision of subject teacher/ internal examiner. This would contribute to the overall practical marks for the subject.

OR

In case the situation of lockdown continues until Nov-Dec 2021, a *Practical Based Assessment (pen-paper)* of 15 marks would be conducted at the end of Term I at the school level and marks would be submitted by the schools to the Board. This would contribute to the overall practical marks for the subject.

### Term-I Evaluation Scheme

| S. No | Practical                                 | Marks |
|-------|-------------------------------------------|-------|
| 1.    | Volumetric Analysis                       | 4     |
| 2.    | Salt Analysis                             | 4     |
| 3.    | Content Based experiment                  | 2     |
| 4.    | Class record and viva (Internal Examiner) | 5     |
|       | TOTAL                                     | 15    |

#### (1) Volumetric analysis (4 marks)

Determination of concentration/ molarity of  $\text{KMnO}_4$  solution by titrating it against a standard solution of:

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

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

#### (3) Content Based Experiments (2 marks)

##### A. Chromatography

- Separation of pigments from extracts of leaves and flowers by paper chromatography and determination of  $R_f$  values.
- Separation of constituents present in an inorganic mixture containing two cations only (constituents having large difference in  $R_f$  values to be provided).

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

**COURSE STRUCTURE**  
**CLASS XI (2021-22)**  
**TERM - I**

One Paper

**90 Minutes**

**Max Marks: 40**

| No.          | Units                      | Marks     |
|--------------|----------------------------|-----------|
| I.           | Sets and Functions         | 11        |
| II.          | Algebra                    | 13        |
| III.         | Coordinate Geometry        | 6         |
| IV.          | Calculus                   | 4         |
| V.           | Statistics and Probability | 6         |
|              | Total                      | 40        |
|              | Internal Assessment        | 10        |
| <b>Total</b> |                            | <b>50</b> |

\*No chapter-wise weightage. Care to be taken to cover all the chapters.

**Unit-I: Sets and Functions**

**1. Sets**

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

**2. Relations & Functions**

Ordered pairs. Cartesian product of sets. Number of elements in the Cartesian product of two finite sets. Cartesian product of the set of reals with itself ( $R \times R$  only). Definition of relation, pictorial diagrams, domain, co-domain and range of a relation. Function as a special type of relation. Pictorial representation of a function, domain, co-domain and range of a function. Real valued functions, domain and range of these functions, constant, identity, polynomial, rational, modulus, signum, exponential, logarithmic and greatest integer functions, with their graphs.

## Unit-II: Algebra

### 1. Complex Numbers and Quadratic Equations

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

### 2. Sequence and Series

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

## Unit-III: Coordinate Geometry

### 1. Straight Lines

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

## Unit-IV: Calculus

### 1. Limits

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

## Unit-V: Statistics and Probability

### 1. Statistics

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

| INTERNAL ASSESSMENT                                                                      | 10 MARKS |
|------------------------------------------------------------------------------------------|----------|
| Periodic Test                                                                            | 5 Marks  |
| Mathematics Activities: Activity file record +Term end assessment of one activity & Viva | 5 Marks  |

**Note:** For activities NCERT Lab Manual may be referred

## TERM - II

One Paper

Max Marks: 40

| No.  | Units                              | Marks     |
|------|------------------------------------|-----------|
| I.   | Sets and Functions (Cont.)         | 8         |
| II.  | Algebra (Cont.)                    | 11        |
| III. | Coordinate Geometry (Cont.)        | 9         |
| IV.  | Calculus (Cont.)                   | 6         |
| V.   | Statistics and Probability (Cont.) | 6         |
|      | Total                              | 40        |
|      | Internal Assessment                | 10        |
|      | <b>Total</b>                       | <b>50</b> |

### Unit-I: Sets and Functions

#### 1. Trigonometric Functions

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

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

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

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

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

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

## Unit-II: Algebra

### 1. Linear Inequalities

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

### 2. Permutations and Combinations

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

## Unit-III: Coordinate Geometry

### 1. Conic Sections

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

### 2. Introduction to Three-dimensional Geometry

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

## Unit-IV: Calculus

### 1. Derivatives

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

## Unit-V: Statistics and Probability

### 1. Probability

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

| INTERNAL ASSESSMENT                                                                      | 10 MARKS |
|------------------------------------------------------------------------------------------|----------|
| Periodic Test                                                                            | 5 Marks  |
| Mathematics Activities: Activity file record +Term end assessment of one activity & Viva | 5 Marks  |

**Note:** For activities NCERT Lab Manual may be referred

- Please refer the guidelines given under XII Mathematics Syllabus:

**Computer Science**  
**CLASS - XI**  
**Code No. 083**  
**2021-22**

## 1. Learning Outcomes

Student should be able to

- a) develop basic computational thinking
- b) explain and use data types
- c) appreciate the notion of algorithm
- d) develop a basic understanding of computer systems - architecture, operating system and cloud computing
- e) explain cyber ethics, cyber safety and cybercrime
- f) Understand the value of technology in societies along with consideration of gender and disability issues

## 2. Distribution of Marks

| Unit No. | Unit Name                                  | Marks | Periods |           |
|----------|--------------------------------------------|-------|---------|-----------|
|          |                                            |       | Theory  | Practical |
| I        | Computer Systems and Organisation          | 10    | 10      | 5         |
| II       | Computational Thinking and Programming - 1 | 45    | 50      | 35        |
| III      | Society, Law and Ethics                    | 15    | 20      | ----      |
|          | Total                                      | 70    | 80      | 40        |

|     |                                            | Term-1 | Term-2 |
|-----|--------------------------------------------|--------|--------|
|     |                                            | Marks  | Marks  |
| I   | Computer Systems and Organisation          | 10     | ---    |
| II  | Computational Thinking and Programming - 1 | 25     | 20     |
| III | Society, Law and Ethics                    | ---    | 15     |
|     |                                            | 35     | 35     |

### 3. Unit wise Syllabus

#### TERM 1:

#### **Unit I: Computer Systems and Organisation**

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

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

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

## **TERM 2:**

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

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

### **Unit III: Society, Law and Ethics**

- Digital Footprints
- Digital society and Netizen: net etiquettes, communication etiquettes, social media etiquettes
- Data protection: Intellectual Property Right (copyright, patent, trademark), violation of IPR (plagiarism, copyright infringement, trademark infringement), open source softwares and licensing (Creative Commons, GPL and Apache)
- Cyber-crime: definition, hacking, eavesdropping, phishing and fraud emails, ransomware, preventing cyber crime
- Cyber safety: safely browsing the web, identity protection, confidentiality, cyber trolls and bullying.
- Safely accessing web sites: malware, viruses, Trojans, adware
- E-waste management: proper disposal of used electronic gadgets
- Indian Information Technology Act (IT Act)
- Technology & Society: Gender and disability issues while teaching and using computers

## 4. Practical

| S.No. |                                                                                                                                                                                                                                                              | Marks<br>(Total=30) | Term-1<br>(15 Marks) | Term-2<br>(15 Marks) |
|-------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|----------------------|----------------------|
| 1.    | Python program                                                                                                                                                                                                                                               | 12                  | 6                    | 6                    |
| 2.    | Report file: Minimum 20 Python programs<br>Term- 1 : Minimum 10 programs based on Term – 1 syllabus<br>Term- 2 : Minimum 10 programs based on Term – 2 syllabus                                                                                              | 7                   | 4                    | 3                    |
|       | Viva voce                                                                                                                                                                                                                                                    | 3                   | 2                    | 1                    |
| 3.    | Project + Viva voce<br>Term – 1 : Synopsis of the project to be submitted by the students (documentation only)<br><br>Term - 2 : Final coding + Viva voce<br>(Student will be allowed to modify their Term 1 document and submit the final executable code.) | 8                   | 3                    | 5                    |

## 5. Suggested Practical List

### Term - 1

Input a welcome message and display it.

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

| Pattern-1                       | Pattern-2                                 | Pattern-3                       |
|---------------------------------|-------------------------------------------|---------------------------------|
| *<br>**<br>***<br>****<br>***** | 1 2 3 4 5<br>1 2 3 4<br>1 2 3<br>1 2<br>1 | A<br>AB<br>ABC<br>ABCD<br>ABCDE |

- Write a program to input the value of x and n and print the sum of the following series:
  - $1+x+x^2+x^3+x^4+. \dots \dots \dots x^n$
  - $1-x+x^2-x^3+x^4 \dots \dots \dots x^n$
  - $x - \frac{x^2}{2} + \frac{x^3}{3} - \frac{x^4}{4} + \dots \dots \dots \frac{x^n}{n}$
  - $x + \frac{x^2}{2!} - \frac{x^3}{3!} + \frac{x^4}{4!} \dots \dots \dots \frac{x^n}{n!}$
- Determine whether a number is a perfect number, an armstrong number or a palindrome.
- Input a number and check if the number is a prime or composite number.

- Display the terms of a Fibonacci series.
- Compute the greatest common divisor and least common multiple of two integers.
- Count and display the number of vowels, consonants, uppercase, lowercase characters in string.
- Input a string and determine whether it is a palindrome or not; convert the case of characters in a string.

## **Term - 2**

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

## **6. Suggested Reading Material**

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

**PHYSICAL EDUCATION (048)**  
**DISTRIBUTION OF SYLLABUS – CLASS XII – 2021-2022**  
**TERM - I AND TERM - II**

| <b>TERM I – THEORY</b><br><b>MCQ BASED - 35 MARKS</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>TERM II – THEORY</b><br><b>SHORT/LONG ANSWER – 35 MARKS</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>*Unit No.</b>                                      | <b>Name</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <b>*Unit No.</b>                                               | <b>Name</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>1</b>                                              | <b>Planning in Sports</b> <ul style="list-style-type: none"> <li><input type="checkbox"/> Meaning &amp; Objectives Of Planning</li> <li><input type="checkbox"/> Various Committees &amp; its Responsibilities (pre; during &amp; post)</li> <li><input type="checkbox"/> Tournament – Knock-Out, League Or Round Robin &amp; Combination</li> <li><input type="checkbox"/> Procedure To Draw Fixtures – Knock-Out (Bye &amp; Seeding) &amp; League (Staircase &amp; Cyclic)</li> </ul> | <b>3</b>                                                       | <b>Yoga &amp; Lifestyle</b> <ul style="list-style-type: none"> <li><input type="checkbox"/> Asanas as preventive measures</li> <li><input type="checkbox"/> Obesity: Procedure, Benefits &amp; contraindications for Vajrasana, Hastasana, Trikonasana, Ardh Matsyendrasana</li> <li><input type="checkbox"/> Diabetes: Procedure, Benefits &amp; contraindications for Bhujangasana, Paschimottasana, Pavan, Muktasana, Ardh Matsyendrasana</li> <li><input type="checkbox"/> Asthma: Procedure, Benefits &amp; contraindications for Sukhasana, Chakrasana, Gomukhasana, Parvatasana, Bhujangasana, Paschimottasana, Matsyasana</li> <li><input type="checkbox"/> Hypertension: Tadasana, Vajrasana, Pavan, Muktasana, Ardha Chakrasana, Bhujangasana, Sharasana</li> </ul> |
| <b>2</b>                                              | <b>Sports &amp; Nutrition</b> <ul style="list-style-type: none"> <li><input type="checkbox"/> Balanced Diet &amp; Nutrition: Macro &amp; Micro Nutrients</li> <li><input type="checkbox"/> Nutritive &amp; Non-Nutritive Components Of Diet</li> <li><input type="checkbox"/> Eating For Weight Control – A Healthy Weight, The Pitfalls of Dieting, Food</li> </ul>                                                                                                                    | <b>4</b>                                                       | <b>Physical Education &amp; Sports for CWSN (Children with Special Needs - DIVYANG)</b> <ul style="list-style-type: none"> <li><input type="checkbox"/> Concept of Disability &amp; Disorder</li> <li><input type="checkbox"/> Types of Disability, its causes &amp; nature (cognitive disability, intellectual</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

|          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|          | Intolerance & Food Myths                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |          | <p>disability, physical disability)</p> <ul style="list-style-type: none"> <li>□ Types of Disorder, its cause &amp; nature (ADHD, SPD, ASD, ODD, OCD)</li> <li>□ Disability Etiquettes</li> <li>□ Strategies to make Physical Activities assessable for children with special need.</li> </ul>                                                                                                                                                                                                                                                                                                                               |
| <b>5</b> | <b>Children &amp; Women in Sports</b> <ul style="list-style-type: none"> <li>□ Motor development &amp; factors affecting it</li> <li>□ Exercise Guidelines at different stages of growth &amp; Development</li> <li>□ Common Postural Deformities - Knock Knee; Flat Foot; Round Shoulders; Lordosis, Kyphosis, Bow Legs and Scoliosis and their corrective measures</li> <li>□ Sports participation of women in India</li> </ul>                                                                                     | <b>7</b> | <b>Physiology &amp; Injuries in Sports</b> <ul style="list-style-type: none"> <li>• Physiological factor determining component of Physical Fitness</li> <li>• Effect of exercise on Cardio Respiratory System</li> <li>• Effect of exercise on Muscular System</li> <li>• Sports injuries: Classification (Soft Tissue Injuries: (Abrasion, Contusion, Laceration, Incision, Sprain &amp; Strain) Bone &amp; Joint Injuries: (Dislocation, Fractures: Stress Fracture, Green Stick, Communated, Transverse Oblique &amp; Impacted) Causes, Prevention&amp; treatment</li> <li>• First Aid – Aims &amp; Objectives</li> </ul> |
| <b>6</b> | <b>Test &amp; Measurement in Sports</b> <ul style="list-style-type: none"> <li>○ Motor Fitness Test – 50 M Standing Start, 600 M Run/Walk, Sit &amp; Reach, Partial Curl Up, Push Ups (Boys), Modified Push Ups (Girls), Standing Broad Jump, Agility – 4x10 M Shuttle Run</li> <li>○ Measurement of Cardio Vascular Fitness – Harvard Step Test/Rockport Test -<br/> <u>Duration of the Exercise in Seconds</u><br/> <math>\times 100</math><br/>           5.5 x Pulse count of 1-1.5 Min after Exercise</li> </ul> | <b>9</b> | <b>Psychology &amp; Sports</b> <ul style="list-style-type: none"> <li>• Personality; its definition &amp; types – Trait &amp; Types (Sheldon &amp; Jung Classification) &amp; Big Five Theory</li> <li>• Motivation, its type &amp; techniques</li> <li>• Meaning, Concept &amp; Types of Aggressions in Sports</li> </ul>                                                                                                                                                                                                                                                                                                   |

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|---------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                   | <ul style="list-style-type: none"> <li>○ Rikli &amp; Jones - Senior Citizen Fitness Test</li> </ul>                                                                                                                                                                                   |                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>8</b>                                          | <b>Biomechanics &amp; Sports</b> <ul style="list-style-type: none"> <li>• Meaning and Importance of Biomechanics in Sports</li> <li>• Types of movements (Flexion, Extension, Abduction &amp; Adduction)</li> <li>• Newton's Law of Motion &amp; its application in sports</li> </ul> | <b>10</b>                                                  | <b>Training in Sports</b> <ul style="list-style-type: none"> <li>• Strength – Definition, types &amp; methods of improving Strength – Isometric, Isotonic &amp; Isokinetic</li> <li>• Endurance - Definition, types &amp; methods to develop Endurance – Continuous Training, Interval Training &amp; Fartlek Training</li> <li>• Speed – Definition, types &amp; methods to develop Speed – Acceleration Run &amp; Pace Run</li> <li>• Flexibility – Definition, types &amp; methods to improve flexibility</li> <li>• Coordinative Abilities – Definition &amp; types</li> </ul> |
| <b>TERM I – PRACTICAL</b>                         |                                                                                                                                                                                                                                                                                       | <b>TERM II – PRACTICAL</b>                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Project File<br>(About one sport/game of choice ) | 05 Marks                                                                                                                                                                                                                                                                              | Project File<br>(Yoga and General Motor Fitness Test)      | 05 Marks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Demonstration of Fitness Activity                 | 05 Marks                                                                                                                                                                                                                                                                              | Demonstration of Fitness Activity/Yoga                     | 05 Marks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Viva Voce (From Project File; Fitness)            | 05 Marks                                                                                                                                                                                                                                                                              | Viva Voce (From Project File; General Motor Fitness; Yoga) | 05 Marks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

**\*For resource material refer Class XII Physical Education Handbook available at Board's Academic website: [www.cbseacademic.nic.in](http://www.cbseacademic.nic.in)**