

**REDUCED SYLLABUS  
&  
SCHEME OF EXAMINATIONS  
AND QUESTION DESIGN  
*for*  
H.S.S.L.C. EXAMINATION**

**2020 – 2021**



**MIZORAM BOARD OF SCHOOL EDUCATION  
AIZAWL : 796 012**

MIZORAM BOARD OF SCHOOL EDUCATION  
AIZAWL : 796 012

Dated Aizawl, the 7<sup>th</sup> August, 2020

NOTIFICATION


No. J.11016/1/2018-MBSE(Acad)/16 : It is notified for the information of all High Schools & Higher Secondary Schools that in view of the long closure of schools due to relentless spreading of Covid – 19 pandemic resulting in the extreme loss of classroom instructional time, the 83<sup>rd</sup> Meeting of the Syllabus Committee of the Board, held on 5<sup>th</sup> August, 2020 had resolved to reduce the syllabus of High School & Higher Secondary School by 30% (Thirty percent) from the existing course. As such, all High Schools & Higher Secondary Schools are hereby directed to adopt their respective reduced syllabus for the academic session 2020 – 2021 as enclosed herewith.

The reduced syllabi are also available on the Board's official website [www.mbse.edu.in](http://www.mbse.edu.in).

Sd/- LALTHANGBIKA  
Secretary  
Mizoram Board of School Education

Memo No. No. J.11016/1/2018-MBSE(Acad)/16 :: Dated Aizawl, the 7<sup>th</sup> August, 2020  
Copy to :

1. The Commissioner & Secretary to Govt. of Mizoram, School Education Department and Controlling Authority of the MBSE, Aizawl.
2. The Director, School Education Department, Govt. of Mizoram, Aizawl.
3. The Principal, Institute of Advanced Study in Education, Aizawl.
4. The Controller of Examinations, MBSE.
5. Regional Officer, MBSE Regional Office, Lunglei.
6. All District Education Officers, Govt. of Mizoram, for information, with a request to circulate to all Secondary Schools & Higher Secondary Schools under their jurisdiction.
7. System Administrator MBSE, for uploading in the official website.
8. All others concerned.
9. Guard File I.

  
(R. LALTHLAMUANA)  
Director (Academic)  
Mizoram Board of School Education

**Subject : English**

**Class : 12**

Unit	Topic / Portion deleted for 2020-2021 academic session	Percentage
3.2	Section – B : Writing Skills 1. Short Composition (Invitation, Posters) 2. Letter Writing : Business or Official letters for making enquiries, asking for and giving in orders and sending replies. 3. Article Writing	
3.3	Section – C : Literature Textbook – Flamingo Poetry : 1) A Roadside Stand 2) Aunt Jennifer's Tiger  Prose : 1) Poets and Pancakes 2) Going Places 3) The Interviews  Textbook – Vistas : 1) The Tiger King 2) Journey to the End of the Earth 3) Evans Tries on O-level	
	Total	30 %

Weightage to content area of selected portion :

Unit	Topic / Portion deleted for 2020-2021 academic session	Mark
3.1	Section – A Reading Skills (Same as before)	15
3.2	Section – B : Writing Skills 1. Short Compilation (Notice, Advertisements) 2. Letter Writing : 1) Letters of Complaints 2) Application for a job 3) Letters to Editors 3. Report Writing	25
3.3	Section – C : Literature (marks for each question same as before) Textbook - Flamingo: Poetry Section: * My Mother at sixty six * An Elementary School Classroom in a Slum * Keeping Quiet * A thing of Beauty  Prose Section	40

	<p>Flamingo:</p> <ul style="list-style-type: none"> <li>* The Last Lesson</li> <li>* Lost Spring <ul style="list-style-type: none"> <li>*Deep Water</li> <li>*The Rattrap</li> <li>*Indigo</li> </ul> </li> </ul>	
	<p>Vistas:</p> <ul style="list-style-type: none"> <li>* The Third Level</li> <li>* The Enemy</li> <li>* Should Wizard Hit Mommy</li> <li>* On the Face of it</li> <li>* Memories of Childhood</li> </ul> <p>Note : Weightage to Objectives of Learning, Form of Questions and Weightage to Content Area are same as before.</p>	
	Total	80

Weightage to form of questions :

Sl No.	Type of questions	No. of questions	Mark for each question	Total
1	Objective type	16	1	16
2	Short Answer I	11	02	22
3	Short Answer II	1/1	3/4	07
4	Long Answer I	05	05	25
5	Long Answer II	01	10	10
	Total	35		80

**Subject : Mizo****Class : 12**

Unit	Topic / Portion Deleted for 2020—2021 academic session	Percentage
I Hla (Poetry)	Enchimloh chawi lai by Ralngama	
	Zoram ! Ka ram ! by Kaphleia	
	Tleitirah Tleitiri by Durra Chawngthu	
	Kan dam chhông ni by P.S. Chawngthu	
	Hmanah pi pu lenlai chul hnu by Damhauva	
	Pan lai ka ram tuanna by Lalsangzuali Sailo	
II Thu (Prose)	Zirlaite hnena thuchah by Zikpuii Pa	
	Lungphâng lo la by L.Keivom	
	Leilung hi Pathian siam a ni (lehlín) by P.L. Liandinga	
	Tawrhna by Zairema	
	Mi huaissen by Thanpuii Pa	
	Ngaihtuahna by C.H. Thangkhûma	
IV Thawnthu Tawi	Lal hlau lo thi by Lalzuia Colney	
	Total	30 %

Weightage to content area :

Unit	Topic Selected for 2020—2021 academic session	Mark
I Hla (Poetry)	Phungrual an tin ang a by Laithangpuia	18 Marks (6+4+2+2+1+1+1+1)
	I tân ka ding zêl ang by T.Zorampêla	
	Kâr a hla by Lalhmingthanga	
	Phêngphe nunnêm by Zirsangzêla Hnamte	
	Pi pu chhuahtlâng hlui by Liandâla	
	Hausiampa Zai	
II Thu (Prose)	Dawhtheihna by R.L.Thanmawia	18 Marks (6+4+2+2+1+1+1+1)
	Lung in malsâwmna thurûk by H.Lallungmuana	
	Mizo thu leh hla tobul by B. Lalthangliana	
	Mizo hnam zai leh hla thlavâng hauhna by C.Lalsiamthanga	
	Kan nun khuarei an chang tûr hi by C.Thuamluaia	
	I thinrim elo ? by C.Lalhrekima	
III Lemchan (Drama)	Thangzawra by Lalsangzuala	14 Marks (6+4+2+1+1)
V	Adverb	1 + 1

Grammar & Composition	Tawng upa	2 + 1 + 1
	Lehkhathawn (i) Sawisêlna                      (ii) Thu pawî thlen (FIR)	4
	Essay ziah dan	6
Rapid Reader	Chawngmawii & Hrangchhuana by R. Rozika	14 Marks (4+2+2+2+2+1+1)

Weightage to form of questions :

Sl/No.	Type of questions	No. of questions	Mark for each question	Total
1	Objective type	16	1	16
2	Short Answer	10	2	20
3	Long Answer I	5	4	20
4	Long Answer II	4	6	24
	Total	35		80

**Sample Blue Print : Mizo - 12**

Forms of Question/Topic	Knowledge				Comprehension				Expression				HOTS				Evaluation				Total
	Obj (1m)	SA (2m)	LA I (4m)	LA II (6m)	Obj (1m)	SA (2m)	LA I (4m)	LA II (6m)	Obj (1m)	SA (2m)	LA I (4m)	LA II (6m)	Obj (1m)	SA (2m)	LA I (4m)	LA II (6m)	Obj (1m)	SA (2m)	LA I (4m)	LA II (6m)	
Poetry	1(1)				1(1)			6(1)	1(1)	2(1)			1(1)	4(1)				2(1)			18(8)
Prose	1(1)	2(1)			1(1)	2(1)					4(1)	6(1)	1(1)				1(1)				18(8)
Drama	1(1)	2(1)	4(1)		1(1)							6(1)									14(5)
Grammar & Composition	2(2)				1(1)		4(1)		1(1)			6(1)		2(1)							16(7)
Rapid Reader	1(1)	2(1)					4(1)			2(1)				4(2)			1(1)				14(7)
Sub - total	6(6)	6(3)	4(1)		4(4)	2(1)	8(2)	6(1)	2(2)	4(2)	4(1)	18(3)	2(2)	6(3)	4(1)		2(2)	2(1)			80(35)
Total	16(10)				20(8)				28(8)				12(6)				4(3)				

**Note :** 1) The figure in the bracket denotes the number of questions

2) This is only a sample Blue Print. The question setter may develop his/her own Blue Print as per the question design

Units	Topic/Portion deleted
Unit I: Programming in C++	<p><b>Review of C++ covered in Class – XI:</b> Nonprintable Character Constants, goto statement, Array, defining an array, initializing the arrays, passing arrays to the functions, passing arguments by reference, string handling in C++</p> <p><b>Data File Handling</b> (Delete full section)  Need for a data file, types of data files - text files and binary files; Text Files : Basic file operations on text files : Creating / Writing text file into file, Reading and manipulation of text from an already existing text file (accessing sequentially);  Binary File : Creation of file, Writing data into file, searching for required data from file, Appending data to a file, insertion of data in sorted file, deletion of data from file, modification of data in a file; Implementation of above mentioned data file handling C++; components of C++ to be use with file handling:  Header file fstream.h, ifstream, ofstream, fstream classes;  Opening in text file in in, out, and app modes;  Using cascading operators for writing text to the file and reading text from the file; open(), get(), put(), getting() and close() functions;  detecting end-of-file  (with or without using eof() function);  Opening a binary file using in, out and app modes; open(), read(), write() and close() functions;  Detecting end-of-fiiles(with or without eof() function); tellg(), tellp(), seekg(), seekp() functions.</p> <p>Pointers:  Declaration and initialization of pointers; dynamics memory allocation, deallocation operators : new, delete;  Pointers and arrays of pointers, pointer to an array(1 dimensional array only), function returning a pointer;  Reference variables and use of alias;  Function call by reference, pointer to structures; deference operator *, -&gt;, self-referencial structures;</p> <p>copy constructor, constructor with default arguments;</p>



<b>Unit II: Data Structures</b>	<p><b>Arrays:</b> Sorting (insertion, selection, bubble sort);</p> <p>Concatenation of two linear arrays, merging of two sorted arrays;</p> <p><b>Stack:</b>(Array and Linked implementation of stack):</p> <p>Operations on stack (PUSH and POP) its implementation in C++, converting expressions from INFIX to POSTFIX notation and evaluation of Postfix expression.</p> <p><b>Queue:</b> (Circular array and linked implementation)</p> <p>Operation on queue (insert and delete) and its implementation in C++</p>
<b>Unit-III: Database and SQL</b>	<p><b>Database Concepts:</b> Relational algebra: selection, projection, union and Cartesian product;</p>
<b>Unit-V Communications and Open Source Concepts</b>	<p><b>Network Protocol:</b> PPP Level Remote Login(Telnet), Internet</p> <p><b>Network Security Concepts:</b> Use of cookies, Protection using firewall.</p> <p>India IT Act, Cyber Law, Cyber Crimes, IRP issues, Hacking</p> <p><b>Web Servers:</b> HyperTextMarkup Language (HTML), Extensible Markup Language (XML), Hyper Text Transfer Protocol (HTTP), Domain Names; URL; Protocol Address, Website, Web Browser, Web Server, Web Hosting, Web Scripting - client side (VB Script, Java Script, PHP) and Server Side (ASP, JSP, PHP);</p> <p><b>Open Source Terminologies:</b></p> <p>Open Source Software, Freeware, Shareware, Proprietary software - FLOSS, GNU, FSF, OSI</p>

**Revised Computer Science**  
**CLASS-12**  
**THEORY: 70 MARKS**

**Learning Objectives:**

- To develop logic for problem solving.
- To understand the concept of Object-Oriented Methodology.
- To implement Object Oriented Programming using C++.
- To understand the concept of working with Relational Database.
- To understand the basic concept of algebra of logic.
- To understand and explore the world of communication and networks.
- To understand the concept of Web Services.
- To understand localisation issues.

**Competencies:**

The student will be proficient in the following:

1. Identification of a computer system.
2. Problem solving using Object Oriented Programming.
3. Designing an efficient logic using Object Oriented approach for solution development handling.
4. Database handling.
5. Logic circuit designing.
6. Network concepts and web services.

**Distribution of Marks**

Unit No	Unit Name	Marks
1.	Programming in C++	30
2.	Data Structure	14
3.	Database and SQL	08
4.	Boolean Algebra	08
5.	Communications and Open Source Concepts	10
		<b>Total 70</b>

**UNIT 1 : PROGRAMMING IN C++**

**30 Marks**

**REVIEW : C++ covered in class XI**

Introduction, Structure of a C++ Program, C++ Character set, Data Type, Basic Data Types, Constants, Integer Constant, Floating - Points constants, Character Constants, String Constants, Variables, Declaring the Variable, Operators, Arithmetic Operators, Unary Operators, The Conditional Operator, Order of Precedence of Operators, Using iostream.h, studio.h, Control Statements, if else statement, nested if else, while loop, do-while loop, for loop, nested for loops, break statement, continue, switch statement, nested switched statement, functions, writing a user defined function, accessing the function, function prototypes, void function, built-in functions

## **Object Oriented Programming:**

Concept of object-Oriented Programming - Data Hiding, Data Encapsulation, Class and Object, Abstract class and concrete class, polymorphism (implementation of polymorphism using function overloading as an example in C++);

Inheritance, advantage of Object-Oriented Programming over earlier programming methodologies.

## **Implementation of Object-Oriented Programming Concepts in C++:**

Definition of a class, Member of a class - Data Members and Member Functions (Methods, using private, public and protected visibility modes, default visibility modes (private));

Member function definition: inside of objects as instances of a class; accessing member from object(s), Array of type class, objects as function arguments - pass by value and pass by reference;

## **Constructor and Destructor:**

**Constructor:** Special characteristics, declaration and definition of a constructor, default constructor, overloaded constructors. Copy constructor, constructor with default arguments. **Destructor:** Special characteristics, declaration and definition of destructor;

## **Inheritance (Extending Classes)**

Concept of inheritance, base class, derived class, defining derived classes, protected visibility mode, single level inheritance, multilevel inheritance and multiple inheritance, Privately derived, publicly derived and protected derived class, accessibility of members from objects and within derived class(es);

## **UNIT 2 : DATA STRUCTURES**

**14 Marks**

### **Arrays:**

**One and two dimensional arrays:** Sequential allocation and address calculation;

One dimensional array: Traversal, searching (linear and binary search), Insertion of an element in an array, deletion of an element from an array;

Two dimensional arrays: Traversal, finding sum/difference of two NxM arrays containing numerical values, interchanging rows and columns elements in two-dimensional array;

## **UNIT 3: DATABASE and SQL**

**08 Marks**

### **Database Concepts:**

Relational data model: concept of domain, tuple, relation, keys - primary key, alternate key, candidate key;

### **Structural Query Language:**

**General concepts:** advantage of using SQL, Data Definition Language (DDL) and Data Manipulation Language (DML);

**Data Types:** NUMBER, CHARACTER, DATE;

## **SQL COMMANDS**

CREATE TABLE, DROP TABLE, ALTER TABLE, UPDATE...SET, INSERT, DELETE, SELECT, DISTINCT, FROM, WHERE, IN, BETWEEN, GROUP BY, HAVING, ORDER BY;

## **SQL Functions**

SUM, AVG, COUNT, MAX and MIN

Note: Implementation of the above-mentioned commands could be done on any SQL supported software on one or two table.

## **UNIT 4: BOOLEAN ALGEBRA**

**08 Marks**

Binary valued quantities, Boolean variable, Boolean constant and Boolean operators; AND, OR, NOT; Truth tables, Closure Property, Commutative Law, Associative Law, Identity Law, Inverse Law, Principle of Duality, Idempotent Law, Distributive Law, Absorption Law, Involution Law, DeMorgan's Laws and their applications

## **UNIT 5: COMMUNICATION AND OPEN SOURCE CONCEPTS**

**10 Marks**

Evolution of networking ARPANET, Internet, interspace;  
Different ways of sending data across the network with reference to switching techniques;

### **Data Communication Terminologies:**

Concept of Channel, Baud, Bandwidth (Hz, KHz, MHz) and data transfer rate(bps, kbps, Mbps, Gbps, Tbps);

### **Transmission Media:**

Twisted pair cable, coaxial cable, optical fibre, infrared, radio link, microwave link and satellite link)

### **Network Devices:**

Modem, RJ45 connector, Ethernet Card, Hub, Switch, Gateway;

### **Network Topologies and Types:**

Bus, Star, Tree, concepts of LAN, WAN, MAN;

### **Network Protocol:**

TCP/IP, File Transfer Protocol (FTP), Wireless / Mobile Communication, GSM, CDMA, WLL,  
3G, 4G, SMS, Voice Mail, Application Electronic Mail, Chat, Video Conferencing;

### **Network Security Concepts:**

Threats and prevention from viruses, worms, trojan horses, spams;

Sample Blueprint : **No Change**

**SUBJECT : Computer Science (Practical)**  
**Class : 12**

**Max. marks : 10**  
**Time : 3 hours**  
**No. of paper : 1(One)**

One programming problem in C++ to be developed and tested in computer during examination. Marks are allotted on the basis of the following:

1. **Programming in C++** : **8 marks**
  - a. Marks are allotted on the basis of the following
    - i. Logic : 5 marks
    - ii. Output presentation : 3 marks
2. **Viva Voce** : **2 marks**

### **Suggested Practical for Class XII**

1. Mark obtained by a student in five subjects are entered. Write C++ program using if...else statements to calculate the percent and division based on the following criteria

percent $\geq 75$	Distinction
$75 < \text{percent} \leq 60$	First
$60 < \text{percent} \leq 50$	Second
$50 < \text{percent} \leq 33$	Third
percent $< 33$	Failed
2. C++ program using switch / case to display day of the week by entering the corresponding number.
3. Write a program to check whether the input number is prime or not
4. Write a program to find the factorial value of any number entered through the keyboard.
5. Write a program to illustrate function overloading.
6. Write an OOP of student having private properties like Admno, Sname, three subjects, ctotol( ) function and public functions like TakeData( ) and ShowData( ) to perform their specific functions.
7. Write an Object Oriented Program for Book class having private members - BookNo, BookTitle, Price and TotalCost( ) and public members functions Input( ) and Purchase( ) where the Purchase( ) function invoke the TotalCost( ) member functions with appropriate details.
8. Write a program to perform Linear Search of any value in an array and display the position of the value if found.
9. Write a program using C++ to perform binary search for any item in an ordered array and display the position of the item if found.
10. Write a program to find the addition of two-dimensional matrices.
11. Write C++ program to find the multiplication of two matrices using two-dimensional array.
12. Write a program to find the transpose of two-dimensional matrix.
13. Write C++ program to illustrate binary search method.
14. Write SQL statements which would create the following tables: (i) **Friends** table

(a) SIno	Two digit number primary Key
(b) Fullname	32 characters and compulsory
(c) Contact	Ten digits mobile number

(ii) **Student** table

(a) SIno	Three digits number primary key
(b) Fullname	32 characters and compulsory
(c) Gender	6 characters and value can be "Male" or "Female" only.
(d) Class	4 characters Roman Number compulsory.
(e) RollNo	3 digits number and compulsory
(f) Address	100 characters address not null.
(g) Mobile	10 digits number but not compulsory

(iii) **Marks** table

(a) SIno	Three digit number primary key references to SIno of Student table.
(b) English	Three digit number default value zero
(c) Physics	Three digit number default value zero
(d) Chemistry	Three digit number default value zero
(e) Biology	Three digit number default value zero
(f) Computer	Three digit number default value zero

- (iv) Check and display the structure of all the three tables that you have created.
- (v) Modify "Student" table by removing the Mobile column and then display the table structure to confirm.
- (vi) Add new column called "Fullname" to Marks table which is not compulsory fields and also check the table structure to confirm.
- (vii) Delete your first table "Friends" and check whether its deleted or not.

15. Write SQL statement to practice INSERT, UPDATE & DELETE commands

- (i) Insert the following data to the existing Student table.

SIno	Fullname	Gender	Class	RollNo	Address
1.	Andrews	Male	XII	15	London
2.	Lucy	Female	XII	32	Paris
3.	Boris	Male	XI	23	Delhi
4.	Benjamin	Male	XII	25	Chicago
5.	Christina	Female	XI	64	Beijing

- (ii) Also insert the following data into existing Marks table.

SIno	English	Physics	Chemistry	Biology	Computer
1.	65	45	88	78	97
2.	86	57		90	76
34		3.	87	85	24
75		4.	35	64	34
43					46
5.	45	65	57	87	69

- (iii) Insert new student (11, Peter, Male, XI, 88, London) to Student table. And also check whether the total rows equal to 11 in Student table.
- (iv) Update any three names from Student table to Marks table.
- (v) Now remove or delete the newly entered student details of SIno 11.

Write SQL statement for SELECT, UNION, FUNCTIONS & VIEWS

Using the two existing tables - Student and Marks, perform the followings using SQL commands.

- (vi) Display all records from Student table.
- (vii) Display SNo, Fullname and Computer marks from Marks table. iii. Display all students who live in Paris. iv. Display marks detail of SNo 5 only from Marks table.
- v. Display all class - XII female students from student table.
- vi. Display marks details of SNo 3 to 8 including both numbers.
- vii. Find the total marks obtained by Christina. viii. Find out the maximum mark obtained in Computer subject. ix. Find out the minimum mark obtained in English subject
- x. What is the average mark score in Physics subject?
- xi. What is the total of all Chemistry marks of all the student? xii. Show the total number of students from Student table. xiii. Display all records from Student such that male and female should not be mixed up. xiv. Display all Address from Student table without any duplicate value. xv. Display how many students are there in Class XI and XII.
- xvi. Suppose pass mark in computer is 50, display the names of student who failed in computer subject.
- xvii. Display the names of student who score 80 or above in English subject.
- xviii. Display all students from Student table alphabetically by Fullname;
- xix. Display all names from Student table as well as Marks table together.

**Subject : Mathematics      Class : 12**

Unit	Topic / Portion deleted for 2020-2021 academic session
I-Relations and Functions	<p><b>1. Relations and Functions:</b> Composite functions, Inverse of a functions, binary operations</p> <p><b>2. Inverse Trigonometric Functions:</b> Graph of inverse trigonometric function. Elementary properties of inverse trigonometric functions.</p>
II-Algebra	<p><b>1. Matrices:</b> Concept of elementary row and column operation, Invertible matrices and proof of uniqueness of inverse if it exists.</p> <p><b>2. Determinants:</b> Properties of determinants, consistency, inconsistency and number of solutions of system of linear equations by examples.</p>
III-Calculus	<p><b>1. Continuity and Differentiability:</b> Rolle's and Lagrange's Mean Value Theorem (Without proof) and their geometric interpretation.</p> <p><b>2. Applications of Derivatives:</b> Rate of change of bodies, use of derivatives in approximation.</p> <p><b>3. Integrals:</b> <math>\int \sqrt{a^2 + bx + c} \, dx</math>, <math>\int (px+q) \sqrt{a^2 + bx + c} \, dx</math> Definite integral as limit of sum</p> <p><b>4. Applications of the Integrals:</b> Area between the two above-said curves (For eg. Area between Parabola and Circle etc.)</p> <p><b>5. Differential Equations:</b> Formation of differential equation <math>\frac{dx}{dy}</math> whose general solution is given, Solution of linear differential equation of the type <math>\frac{dx}{dy} + Px = Q</math> ; where P and Q are function of y or constant</p>
IV-Vectors and threedimensional geometry	<p><b>1. Vectors:</b> Scalar triple product of vectors, projection vector on a line</p> <p><b>2. Three-dimensional geometry:</b> Angle between (i) two lines (ii) two planes (iii) a line and a plane. Distance of a point from a plane</p>
VI-Probability	Mean and variance of random variable, Binomial distribution, Repeated independent (Bernoulli) trials.



**MATHEMATICS**  
**Revised COURSE STRUCTURE**  
**CLASS 12 (THEORY)**

One Paper	Time: 3 hours	Max Marks: 80
<u>Units</u>	<u>Titles</u>	<u>Weightage</u>
I	Relation and Functions	08 Marks
II	Algebra	10 Marks
III	Calculus	34 Marks
IV	Vector and Three Dimensional Geometry	14 Marks
V	Linear Programming	06 Marks
VI	Probability	08 Marks
TOTAL		80 Marks

**Unit-I: RELATIONS AND FUNCTIONS**

**08Marks**

1. Relations and Functions

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

2. Inverse Trigonometric Functions

Definition, range, domain, principal value branches.

**Unit-II: ALGEBRA**

**10 Marks**

1. Matrices

Concept, notation, order, equality, types of matrices, zero and identity matrix, transpose of a matrix, symmetric and skew symmetric matrices. Operation on matrices: Addition and multiplication and multiplication with a scalar. Simple properties of addition, multiplication and scalar multiplication. Non-commutativity of multiplication of matrices and existence of non-zero matrices whose product is the zero matrix (restrict to square matrices of order 2).

2. Determinants

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

**Unit-III: CALCULUS**

**34 Marks**

1. Continuity and Differentiability

Continuity and differentiability, derivative of composite functions, chain rule, derivative of inverse trigonometric functions, derivative of implicit functions. Concept of exponential and logarithmic functions.

Derivatives of logarithmic and exponential functions. Logarithmic differentiation, derivative of functions expressed in parametric forms. Second order derivatives.

2. Applications of Derivatives

Applications of derivatives: increasing/decreasing functions, tangents and normal, maxima and minima (first derivative test motivated geometrically and second derivative test given as

a provable tool). Simple problems (that illustrate basic principles and understanding of the subject as well as real-life situations).

### 3. Integrals

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

$$\int \frac{dx}{x^2 \mp a^2}, \int \frac{dx}{\sqrt{x^2 \mp a^2}}, \int \frac{dx}{\sqrt{a^2 - x^2}}, \int \frac{dx}{ax^2 + bx + c}, \int \frac{dx}{\sqrt{ax^2 + bx + c}}, \int \frac{px + q}{ax^2 + bx + c} dx, \int \frac{px + q}{\sqrt{ax^2 + bx + c}} dx, \\ \int \sqrt{a^2 \mp x^2} : , 4 \sqrt{\quad} - 0 : .$$

Fundamental Theorem of Calculus (without proof). Basic properties of definite integrals and evaluation of definite integrals.

### 4. Applications of the Integrals

Applications in finding the area under simple curves, especially lines, circles/ parabolas/ellipses (in standard form only),

### 5. Differential Equations

Definition, order and degree, general and particular solutions of a differential equation..Solution of differential equations by method of separation of variables, solutions of homogeneous differential equations of first order and first degree. Solutions of linear differential equation of the type:

$$\frac{dy}{dx} + P y = Q, \text{ where } P \text{ and } Q \text{ are functions of } x \text{ or constant.}$$

## Unit-IV: VECTORS AND THREE-DIMENSIONAL GEOMETRY

14 Marks

### 1. Vectors

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

### 2. Three –dimensional Geometry

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

## Unit-V: LINEAR PROGRAMMING

6 Marks

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

**Unit-VI: PROBABILITY****08 Marks**

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

**Sample Blue Print : Mathematics - 12**

Forms of Question/ Topic	Knowledge			Understanding			Application			HOTS			Evaluation				Total
	Obj	SA I	SA II	LA	Obj	SA I	SA II	LA	Obj	SA I	SA II	LA	Obj	SA I	SA II	LA	
Matrices and Determinants	1(1)		4(1)										1(1)				10(4)
Relations and Functions	1(1)				1(1)		4(1)					2(1)					8(4)
Differential Calculus	1(1)		4(1)		1(1)	2(1)						6(1)					14(5)
Integral Calculus	3(3)	2(1)	4(1)		1(1)							6(1)					20(8)
Vectors and 3-D	3(3)												1(1)				14(6)
Linear programming																6(1)	6(1)
Probability	1(1)				1(1)									2(1)			8(4)
<b>Sub- Total</b>	<b>10(10)</b>	<b>2(1)</b>	<b>12(3)</b>		<b>4(4)</b>	<b>2(1)</b>	<b>12(3)</b>	<b>6(1)</b>		<b>4(1)</b>	<b>12(2)</b>	<b>2(2)</b>	<b>2(1)</b>	<b>2(1)</b>		<b>6(1)</b>	<b>80(32)</b>
<b>Total</b>	<b>24(14)</b>			<b>24(9)</b>			<b>16(3)</b>			<b>8(4)</b>			<b>8(2)</b>				

Note : 1) The figures in the bracket denotes the number of questions

2) This is only a sample Blue Print. The question setter may develop his/her own Blue Print as per the question design

**Subject: Physics****Class: 12**

<b>Units</b>	<b>Topic/ Portion Deleted</b>
<b>Unit I: Electrostatics</b>	Application of Gauss theorem to find field due to uniformly charged infinite plane sheet and uniformly charged thin spherical shell (field-inside and outside). Van de Graff generator.
<b>Unit II: Current Electricity</b>	Carbon resistors, colour code for carbon resistors. Series and parallel combinations of resistors. Measurement of internal resistance of a cell.
<b>Unit III: Magnetic Effects of Current and Magnetism</b>	Cyclotron. Magnetic field intensity due to a magnetic dipole (bar magnet) along its axis and perpendicular to its axis. Torque on a magnetic dipole (bar magnet) in a uniform magnetic field.  Para-, dia-, and ferro- magnetic substances, with examples. Electromagnets and factors affecting their strengths. Permanent magnets.
<b>Unit IV: Electromagnetic Induction and Alternating Currents</b>	Power factor, wattless current
<b>Unit V: Electromagnetic Waves</b>	Basic idea of displacement current. (Need for displacement current.)
<b>Unit VI: Optics</b>	Reflection of light, spherical mirrors, mirror formula.. Scattering of light — blue colour of the sky and reddish appearance of the sun at sunrise and sunset. Human eye, image formation and accommodation, correction of eye defects (myopia and hypermetropia) using lenses. Resolving power of microscopes and astronomical telescopes. Polarisation, plane polarised light; Brewster's law, uses of plane polarised light and Polaroids.
<b>Unit VII: Dual Nature of Matter and Radiation</b>	Davisson-Germer experiment.
<b>Unit VIII: Atoms and Nuclei</b>	Radioactivity — alpha, beta and gamma particles/rays and their properties; radioactive decay law. Binding energy per nucleon and its variation with mass number
<b>Unit IX : Electronic Devices</b>	Zener diode; Zener diode as a voltage regulator. Junction transistor, transistor action, characteristics of a transistor; transistor as an amplifier (common emitter configuration) and oscillator. Logic gates (OR, AND, NOT, NAND and NOR). Transistor as a switch.

<b>Unit X: Communication Systems</b>	Elements of a communication system (block diagram only); bandwidth of signals (speech, TV and-digital data), bandwidth of transmission medium. Propagation of electromagnetic waves in the atmosphere, sky and space wave propagation. Need for modulation-Production and detection of an amplitude-modulated wave.
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### **Section A**

#### **Activities**

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

### **Section B**

#### **Activities**

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

**PHYSICS**  
**COURSE STRUCTURE**  
**Class 12 (Theory)**

<b>One Paper</b>		<b>Time 3 Hours</b>	<b>Max. Marks: 70</b>	
<b>Units</b>	<b>Titles</b>		<b>Weightage</b>	
I	Electrostatics		10	
II	Current Electricity		09	
III	Magnetic Effect of Current & Magnetism		07	
IV	Electromagnetic Induction and Alternating Current		10	
V	Electromagnetic Waves		04	
VI	Optics		16	
VII	Dual Nature of Matter		05	VIII
	Atoms and Nuclei			05
IX	Electronic Devices		04	
<b>Total</b>			<b>70</b>	

**Unit I: Electrostatics**

Electric charges and their conservation. Coulomb's law— force between two point charges, forces between multiple charges; superposition principle and continuous charge distribution.

Electric field, electric field due to a point charge, electric field lines; electric dipole, electric field due to a dipole; torque on a dipole in a uniform electric field.

Electric flux, statement of Gauss's theorem- and its applications to find field due- to infinitely long straight wire.

Electric potential, potential difference, electric potential due to a point charge, a dipole and system of charges; equipotential surfaces, electrical potential energy of a system of two point charges and of electric dipoles in an electrostatic field.

Conductors and insulators, free charges and bound charges inside a conductor. Dielectrics and electric polarisation, capacitors and capacitance, combination of capacitors in series and in parallel, capacitance of a parallel plate capacitor with and without dielectric medium between the plates, energy stored in a capacitor

**Unit II: Current Electricity.**

Electric current, flow of electric charges in a metallic conductor drift velocity and mobility, and their relation with electric current; Ohm's law, electrical resistance,  $V$ -  $I$  characteristics (linear and non-linear), electrical energy and power, electrical resistivity and conductivity. Temperature dependence of resistance.

Internal resistance of a cell, potential difference and emf of a cell, combination of cells in series and in parallel.

Kirchhoff -'s laws and simple applications. Wheatstone bridges, metre bridge. (Qualitative ideas only).

Potentiometer – principle and applications to measure potential difference, and for comparing emf of two cells. (Qualitative ideas only).

### **Unit III: Magnetic Effects of Current and Magnetism**

Concept of magnetic field, Oersted's experiment. Biot - Savart law and its application to current carrying circular loop.

Ampere's law and its applications to infinitely long straight wire, straight and toroidal solenoids. (only qualitative treatment).

Force - on a moving charge in uniform magnetic and electric fields.

Force on a current-carrying conductor in a uniform magnetic field. Force between two parallel current-carrying conductors – definition of ampere. Torque experienced by a current loop in a magnetic field; moving coil galvanometer– its current sensitivity and conversion-to ammeter and voltmeter.

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

### **Unit IV: Electromagnetic Induction and Alternating Currents**

Electromagnetic induction; Faraday's law, induced emf and current; Lenz's Law, Eddy currents. Self - and mutual inductance.

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

AC generator and transformer

### **Unit V: Electromagnetic Waves**

Electromagnetic waves and their characteristics-Transverse nature of electromagnetic waves (qualitative ideas only).

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

### **Unit VI: Optics**

Refraction of light, total internal reflection and its applications, optical fibres, refraction at spherical surfaces, lenses, thin lens formula, lens-maker's formula. Magnification, power of a lens, combination of thin lenses in contact combination of a lens and a mirror. Refraction and dispersion of light through a prism.

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

Wave optics: Wavefront and Huygens' principle, reflection and refraction of plane wave at a plane surface using wavefronts.

Proof of laws of reflection and refraction using Huygens' principle.

Interference, Young's double hole experiment and expression for fringe width, coherent sources and sustained interference of light.

Diffraction due to a single slit, width of central maximum.

### **Unit VII: Dual Nature of Matter and Radiation**

Photoelectric effect, Hertz and Lenard's observations (Experimental study of photoelectric effect); Einstein's photoelectric equation –particle nature of light. Matter waves — wave nature of particles, de Broglie relation.



**Unit VIII: Atoms and Nuclei**

Alpha - particle scattering experiment; Rutherford's model of atom; Bohr model, energy levels, hydrogen spectrum. Composition and size of nucleus, atomic masses, isotopes, isobars; isotones.

Mass-energy relation, mass defect; nuclear fission and fusion.

**Unit IX : Electronic Devices**

Energy bands in solids, conductors, insulators and semiconductors(qualitative ideas only); semiconductor diode —  $I$ - $V$  characteristics in forward and reverse bias, diode as a rectifier.

Special purpose p-n junction diodes: LED, photodiode, solar cell.

**Sample Blue Print : Physics - 12**

Forms of Question/ Topic	Knowledge			Understanding			Application			HOTS			Total
	Obj	SA I	SA II	LA	Obj	SA I	SA II	LA	Obj	SA I	SA II	LA	
Electrostatics	1(1)							5(1)				1(1)	10(4)
Current Electricity		2(1)			1(1)		3(1)						9(4)
Magnetic Effects of Current and Magnetism		2(1)			1(1)							1(1)	7(4)
Electromagnetic Induction and Alternating Current			3(1)					5(1)		2(1)			10(3)
Electromagnetic Waves		2(1)							2(2)				4(3)
Optics			3(1)		1(1)		3(1)		2(1)			5(1)	16(6)
Dual Nature of Matter			3(1)						2(2)				5(3)
Atoms and Nuclei			3(1)						1(1)			1(1)	5(3)
Electronic Devices	2(2)					2(1)							4(3)
Sub - total	3(3)	6(3)	12(4)		3(3)	2(1)	6(2)	10(2)	5(5)	2(1)	9(3)	5(1)	70(33)
<b>Total</b>		<b>21(10)</b>				<b>21(8)</b>				<b>21(10)</b>			<b>70(33)</b>
										4(2)			<b>7(5)</b>

**Note :** 1) The figures in the bracket denotes the number of questions

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## **PRACTICALS**

### **Class 12**

Every student will perform at least 8 experiments (from any section).

#### **Section A**

##### **Experiments**

1. To find resistance of a given wire using metre bridge and hence determine the specific resistance of its material.
2. To determine resistance per cm of a given wire by plotting a graph of potential difference versus current.
3. To verify the laws of combination (series/parallel) of resistances using a metre bridge.
4. To compare the emf's of two given primary cells using potentiometer.
5. To determine the internal resistance of a given primary cell using potentiometer.
6. To determine resistance of a galvanometer by half-deflection method and to find its figure of merit.
7. To convert the given galvanometer (of known resistance of figure of merit) into an ammeter and voltmeter of desired range and to verify the same.
8. To find the frequency of the ac mains with a sonometer.

#### **Section B**

##### **Experiments**

1. To find the value of  $v$  for different values of  $u$  in case of a concave mirror-and to find the focal length
2. To find the focal length of a convex mirror, using a convex lens.
3. To find the focal length of a convex lens by plotting graphs between  $u$  and  $v$  or between  $1/u$  and  $1/v$ .
4. To find the focal length of a concave lens, using a convex lens.
5. To determine angle of minimum deviation for a given prism by plotting a graph between the angle of incidence and the angle of deviation.
6. To determine refractive index of a glass slab using a travelling microscope.
7. To find refractive index of a liquid by using (i) concave mirror, (ii) convex lens and plane mirror.
8. To draw the I-V characteristics curves of a p-n junction in forward bias and reverse bias.
9. To draw the characteristics curve of a zener diode and to determine its reverse break down voltage.
10. To study the characteristics of a common-emitter npn or pnp transistor and to find out the values of current and voltage gains.

**Subject : Chemistry**

**Class : 12**

Unit	Topic / Portion deleted for 2020-2021 academic session
I	Solid State Electrical and magnetic properties, Band theory of metals ,conductors, semiconductors and insulators and <i>n</i> and <i>p</i> type semiconductors.
II	Solutions Abnormal molecular mass, Vant-Hoff factor
III	Electrochemistry Laws of electrolysis (elementary idea), dry cell—electrolytic cells and Galvanic cells; lead accumulator, fuel cells; corrosion.
IV	Chemical Kinetics Concept of collision theory (elementary idea, no mathematical treatment). Activation energy, Arrhenius equation.
V	Surface Chemistry catalysis :homogenous and heterogeneous, activity and selectivity; enzyme catalysis; emulsions — types of emulsions
VI	General Principles and Processes of Isolation of Elements <i>Principles and methods of extraction</i> — concentration, oxidation, reduction electrolytic method and refining; occurrence and principles of extraction of aluminium, copper, zinc and iron.
VII	p-Block Elements <i>Group 15 element</i> : Oxides of nitrogen (Structure -only); Phosphorous-allotropic forms; compounds of phosphorous: preparation and properties of phosphene ,halides ( $\text{PCl}_3$ , $\text{PCl}_5$ ) and oxoacids (elementary idea only). <i>Group 15 element</i> : Preparation, sulphuric acid: industrial process of manufacture.
VIII	d -and f- Block Elements Preparation and properties of $\text{K}_2\text{Cr}_2\text{O}_7$ and $\text{KMnO}_4$ . Lanthanoids - chemical reactivity. Actinoids - Electronic configuration, oxidation states and comparison with lanthanoids
IX	Coordination Compounds isomerism (structural and stereo) importance of coordination compounds (in qualitative analysis, extraction of metals and biological systems).
X	Haloalkanes and Haloarenes Uses and environmental effects of - dichloromethane, trichloromethane, tetrachloromethane, iodoform, freons, DDT.
XI	Alcohols, Phenols and Ethers Alcohols : uses, with special reference to methanol and ethanol.
XIII	Organic Compounds Containing Nitrogen <i>Diazonium salts</i> : Preparation, chemical reactions and importance in synthetic organic chemistry.

XIV	<p>Biomolecules</p> <p><i>Carbohydrates</i> - oligosaccharides (sucrose, -lactose, maltose), polysaccharides (starch, cellulose, glycogen): importance.</p> <p><i>Proteins</i> – enzymes</p> <p><i>Hormones</i> – Elementary idea (excluding structure).</p> <p><i>Vitamins</i> – Classification and functions.</p>
XV	<p>Polymers</p> <p><i>Classification</i> — Natural and synthetic, methods of polymerization (addition and condensation), copolymerization. Some important polymers: natural and synthetic like polythene, nylon, polyesters, bakelite; rubber Biodegradable and non-biodegradable polymers.</p>
XVI	<p>Chemistry in Everyday Life</p> <ol style="list-style-type: none"> <li>1. Chemicals and medicines — analgesics, tranquilizers, antiseptics, disinfectants, antimicrobials, antifertility drugs, antibiotics, antacids, antihistamines.</li> <li>2. Chemicals in food — preservatives, artificial sweetening agents, elementary idea of antioxidants.</li> <li>3. Cleansing agents - soaps and detergents, cleansing action.</li> </ol>

Weightage to content area of selected portion :

Unit	Topic / Portion Selected for 2020-2021 academic session	Mark
I	<p>Solid State</p> <p>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.</p>	05
II	<p>Solutions</p> <p>Types of solutions, expression of concentration of solutions of solids in liquids, solubility of gases in liquids, solid solutions, colligative properties — relative lowering of vapour pressure, Raoult's law, elevation of B.P., depression of freezing point osmotic pressure, determination of molecular masses using colligative properties.</p>	05
III	<p>Electrochemistry</p> <p>Redox reactions, conductance in electrolytic solutions, specific and molar conductivity variations of conductivity with concentration, Kohlrausch's Law, electrolysis, EMF of a cell, standard electrode potential, Nernst equation and its application to chemical cells. Relation between Gibbs energy change and EMF of a cell.</p>	06
IV	<p>Chemical Kinetics</p> <p>Rate of a reaction (average and instantaneous), factors affecting rates of reaction: concentration, temperature, catalyst; order and molecularity of a reaction; rate law and specific rate constant, integrated rate equations and half life (only for-zero and first order reactions).</p>	05

V	<p>Surface Chemistry</p> <p><i>Adsorption</i> — physisorption and chemisorption; factors affecting adsorption of gases on solids; colloidal state; distinction between true solutions, colloids and suspensions; lyophilic, lyophobic multimolecular and macromolecular colloids; properties of colloids; Tyndall effect, Brownian movement, electrophoresis, coagulation.</p>	04
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VII	<p>p-Block Elements</p> <p><i>Group 15 element:</i> 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.</p> <p><i>Group 16 elements:</i> General introduction, electronic configuration, oxidation states, occurrence, trends in physical and chemical properties; dioxygen, properties and uses; classification of oxides; ozone. Sulphur — allotropic forms; compounds of sulphur: preparation, properties and uses of sulphur dioxide, properties and uses, oxoacids of sulphur (structures only).</p> <p><i>Group 17 elements:</i> 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).</p> <p><i>Group 18 elements:</i> General introduction, electronic configuration, occurrence, trends in physical and chemical properties, uses.</p>	08
VIII	<p>d -and f- Block Elements</p> <p>General introduction, electronic configuration, occurrence and characteristics of transition metals, general trends in properties of the first row transition metals – metallic character, ionization enthalpy, oxidation states, ionic radii, colour, catalytic property, magnetic properties, interstitial compounds, alloy formation.</p> <p><i>Lanthanoids</i> - electronic configuration, oxidation states, contraction and its consequences.</p>	05
IX	<p>Coordination Compounds</p> <p><i>Coordination compounds:</i> Introduction, ligands, coordination number, colour, magnetic properties and shapes, IUPAC nomenclature of mononuclear coordination compounds, bonding, Werner's theory VBT, CFT.</p>	06
X	<p>Haloalkanes and Haloarenes</p> <p><i>Haloalkanes</i> : Nomenclature, nature of C-X bond, physical and chemical properties, mechanism of substitution reactions. Optical rotation.</p> <p><i>Haloarenes:</i> Nature of C-X bond, substitution reactions (directive influence of halogen for monosubstituted compounds only).</p>	04

XI	<p>Alcohols, Phenols and Ethers</p> <p><i>Alcohols</i>: Nomenclature, methods of preparation, physical and chemical properties (of primary alcohols only); identification of primary, secondary and tertiary alcohols, mechanism of dehydration.</p> <p><i>Phenols</i>: Nomenclature, methods of preparation, physical and chemical properties, acidic nature of phenol, electrophilic substitution reactions, uses of phenols.</p> <p><i>Ethers</i>: Nomenclature, methods of preparation, physical and chemical properties, uses.</p>	06
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XII	<p>Aldehydes, Ketones and Carboxylic Acids</p> <p><i>Aldehydes and Ketones</i>: Nomenclature, nature of carbonyl group, methods of preparation, physical and chemical properties, and mechanism of nucleophilic addition, reactivity of alpha hydrogen in aldehydes; uses.</p> <p><i>Carboxylic Acids</i>: Nomenclature, acidic nature, methods of preparation, physical and chemical properties; uses.</p>	08
XIII	<p>Organic Compounds Containing Nitrogen</p> <p><i>Amines</i>: Nomenclature, classification, structure, methods of preparation, physical and chemical properties, uses, identification of primary secondary and tertiary amines.</p> <p><i>Cyanides and Isocyanides</i> – will be mentioned at relevant places in context.</p>	04
XIV	<p>Biomolecules</p> <p><i>Carbohydrates</i> - Classification (aldoses and ketoses), monosaccharide (glucose and fructose), DL configuration</p> <p><i>Proteins</i> - Elementary idea of amino acids, peptide bond, polypeptides, proteins, primary structure, secondary structure, tertiary structure and quaternary structure (qualitative idea only), denaturation of proteins.</p> <p><i>Nucleic Acids</i>: DNA and RNA</p>	04
<b>Total</b>		<b>70</b>

**Note :** Question carrying 5 marks, if split up into parts, should not have more than two parts.

Weightage to form of questions :

Sl No.	Type of questions	No. of questions	Mark for each question	Total
1	Objective type	14	1	14
2	Short Answer I	11	2	22
3	Short Answer II	08	3	24
4	Long Answer	02	5	10
	Total	35		70

Scheme of option :

- (i) There shall be no overall choice.
- (ii) Internal choices (either/ or type) in four questions is to be given in questions of the following types:-
  - (a) One in two marks questions (SA I Type)
  - (b) One in three marks questions (SA II Type)
  - (c) Both in the five marks questions (LA type)
- (iii) The alternate questions given by way of choice should be based on the same objective and from the same unit. It should have the same anticipated difficulty level and length of answer, as far as practicable.

Guidelines for evaluation in organic chemistry (units X, XI, XII & XIII) and numerical :

<b>i)</b>	<b>Organic Chemistry Units :</b>	$Q \times M = T$
<b>a)</b>	IUPAC nomenclature	$2 \times 1 = 2$
<b>b)</b>	Reasoning	$3 \times 2 = 6$
<b>c)</b>	Distinction of organic compounds	$2 \times 1 =$
	2	
<b>d)</b>	Name Reaction	$3 \times 2 = 6$
<b>e)</b>	Reaction mechanism	$1 \times 2 = 2$
<b>f)</b>	Word problem (conversion) covering 2 properties and reaction of functional group.	$2 \times 2 = 4$

**ii) Numerical**

Weightage of about 12 marks in total has been assigned to numericals.



**Sample Blue Print : Chemistry XII**

Unit	Forms of Question/ Topic	Knowledge				Understanding				Application				HOTS				Total
		Obj (1m)	SA I (2m)	SA II (3m)	LA (5m)	Obj (1m)	SA I (2m)	SA II (3m)	LA (5m)	Obj (1m)	SA I (2m)	SA II (3m)	LA (5m)	Obj (1m)	SA I (2m)	SA II (3m)	LA (5m)	
I	Solid State		2(1)									3(1)						5(2)
II	Solutions					2(2)						3(1)						5(3)
III	Electro chemistry	1(1)											5(1)					6(2)
IV	Chemical Kinetics											3(1)		2(2)				5(3)
V	Surface chemistry	1(1)		3(1)														4(2)
VII	p-Block Elements	1(1)					2(1)		5(1)									8(3)
VIII	d- and f- block elements	2(2)						3(1)										5(3)
IX	Coordination Chemistry			3(1)				3(1)										6(2)
X	Haloalkane and Haloarenes										2(1)				2(1)			4(2)
XI	Alcohols, Phenols and Ethers		2(1)				2(1)								2(1)			6(3)
XII	Aldehydes, Ketones and Carboxylic Acids		2(1)			2(2)					4(2)							8(5)
XIII	Organic Compounds Containing Nitrogen	1(1)					2(1)			1(1)								4(3)
XIV	Biomolecules			3(1)										1(1)				4(2)
<b>Sub-Total</b>		<b>6(6)</b>	<b>6(3)</b>	<b>9(3)</b>		<b>4(4)</b>	<b>6(3)</b>	<b>6(2)</b>	<b>5(1)</b>	<b>1(1)</b>	<b>6(3)</b>	<b>9(3)</b>	<b>5(1)</b>	<b>3(3)</b>	<b>4(2)</b>			<b>70(35)</b>
<b>Total</b>		<b>21(12)</b>				<b>21(10)</b>				<b>21(8)</b>				<b>7(5)</b>				

**Note :** 1) The figures in the bracket denotes the number of questions.

2) This is only a sample Blue Print. The question setter may develop his/her own Blue Print as per the question design.

**Subject : Biology****Class : 12**

Unit	Topic / Portion deleted for 2020-2021 academic session
I	1.Reproduction in organisms 1.2. Reproduction 1.3. Characteristic features of Asexual Reproduction (Fission, Budding, Sporulation, Fragmentation, Vegetative Propagation)
II	Genetics and Evolution Chapter 7: Evolution 7.1. Origin of the Earth 7.2. Theories on the Origin of life ( Origin of life by special creation, spontaneous generation of life, Cosmic origin of life) 7.3. Evidence for evolution 7.4. Examples of evolution by natural selection 7.5. Adaptive Radiations 7.7. Important concepts 7.8. Geological time scale 7.10 Origin and evolution of Man
VIII	Biology and Human Welfare Chapter 9: Strategies for Enhancement in food production 9.1. Animal Husbandry 9.2. Plant Breeding 9.5. Single Cell Protein (SCP) 9.6. Plant Tissue Culture
X	Ecology and Environment Chapter 14: Ecosystem 14.2. Productivity 14.3. Decomposition 14.4. Energy flow 14.5. Ecological Pyramids 14.6. Ecological Succession  Chapter 16: Environmental Issues 16.5. Solid Wastes 16.7. 3. Control of Radioactive Pollution 16.8 1. The Greenhouse Effect 2. Global Warming 3. Depletion of Ozone 16.9. Ozone depletion in the Stratosphere 16.11. Deforestation

Weightage to content area of selected portion :

Unit	Topic / Portion Selected for 2020-2021 academic session	Mark
I	<p>Reproduction</p> <p>Chapter 1: Reproduction in organisms</p> <p>1.1 Life Span</p> <p>1.4 Vegetative Propagation</p> <p>1.5 Sexual Reproduction</p> <p>1.6 Events in Sexual Reproduction</p> <p>1.7 Parthenogenesis</p> <p>Chapter 2: Sexual Reproduction in flowering Plants – whole chapter</p> <p>Chapter 3: Human Reproduction – whole chapter</p> <p>Chapter 4: Reproductive Health- Problems and Strategies– whole chapter</p>	14
II	<p>Chapter 7: Evolution</p> <p>7.2 (4) Chemical Evolution of life – Scientific Hypothesis</p> <p>(B) Oparin Haldane Theory</p> <p>(C) Miller and Urey's Experiment</p> <p>7.6 Biological Evolution 1) Lamark's Theory of Evolution</p> <p>2) Darwin's theory of evolution by natural selection</p> <p>7.9 Concept of Species</p>	16
VIII	<p>Biology and Human Welfare</p> <p>Chapter 9: Strategies for enhancement in food production</p> <p>9.3 Main steps in Breeding – A new genetic variety</p> <p>9.4 Crop improvement</p> <p>9.7 Somatic Hybridization and Protoplast culture</p>	12
X	<p>Ecology and Environment</p> <p>Chapter 14: Ecosystem</p> <p>14.1 Ecosystem – Structure and Function</p> <p>14.7 Nutrient Cycling</p> <p>14.8 Biogeochemical Cycles – 1. Carbon Cycle</p> <p>2. Phosphorus Cycle</p> <p>Chapter 16: Environmental Issues</p> <p>16.1 Pollution</p> <p>16.2 Air Pollution</p> <p>16.3 Noise Pollution</p> <p>16.4 Water Pollution</p> <p>16.5 Soil Pollution</p> <p>16.10 Soil Erosion and Conservation</p>	14

Weightage to form of questions:

Sl No.	Type of questions	No. of questions	Mark for each question	Total
1	Objective type	14	1	14

2	Short Answer I	7	2	14
3	Short Answer II	9	3	27
4	Long Answer	3	5	15
	Total			70

**Sample Blue Print : Biology XII**

Forms of Question/ Topic	Knowledge				Understanding				Application				HOTS				Evaluation				Total
	Obj	SA I	SA II	LA	Obj	SA I	SA II	LA	Obj	SA I	SA II	LA	Obj	SA I	SA II	LA	Obj	SA I	SA II	LA	
Reproduction	2(2)			5(1)	1(1)				1(1)			3(1)					2(1)				14(7)
Genetics and Evolution	2(2)		3(1)			2(1)			1(1)						3(1)						5(1) 16(7)
Biology and Human Welfare	1(1)	2(1)				2(1)			1(1)			3(1)			3(1)						12(6)
Biotechnology and its applications	1(1)		3(1)			2(1)		5(1)				3(1)									14(5)
Ecology and Environment	2(2)				1(1)	2(1)	6(2)			2(1)				1(1)							14(8)
Sub - total	8(8)	2(1)	6(2)	5(1)	2(2)	8(4)	6(2)	5(1)	3(3)	2(1)	9(3)		1(1)	6(2)			2(1)			5(1)	70(33)
Total		21(12)			21(9)				14(7)				7(3)				7(2)				

**Note :** 1) The figures in the bracket denotes the number of questions

2) This is only a sample Blue Print. The question setter may develop his/her own Blue Print as per the question design

**DELETED PORTIONS CLASS XII: PRACTICAL****A: List of Experiments**

1. Study the presence of suspended particulate matter in air at two widely different sites.
2. Study the Plant population density by quadrat method.
3. Study the Plant population frequency by quadrat method.

**B. Study/Observe of the following (spotting)**

1. Pollen germination on stigma through a permanent slide or scanning electron micrograph
2. Mendelian inheritance using seeds of different colour/sizes of any plant.
3. Controlled pollination – emasculation, tagging and bagging.

Weightage to content area of selected portion :

Unit	Topic / Portion Selected for 2020-2021 academic session
I	A. Soil analysis – i) pH ii) Water holding capacity      iii) Moisture content  B. Water analysis- i) pH ii) Clarity iii) Presence of living organism
II	i) Prepare a temporary amount of onion root tip to study mitosis ii) Effect of different temperatures and different pH on the activity of Salivary amylase on starch.

III	<ul style="list-style-type: none"> <li>i) T.S of ovary and T.S of testis</li> <li>ii) Meiosis in grasshopper testis through permanent slides</li> <li>iii) T.S of blastula through permanent slides</li> <li>iv) Prepared pedigree charts of genetic traits such as rolling of tongue, blood groups, widow's peak, colour blindness</li> <li>v) Identification of common disease causing organisms like Ascaris, Entamoeba, Plasmodium, ringworm through permanent slides or specimens. Comment on symptoms of diseases that they cause</li> <li>vi) Plants and animals found in aquatic conditions. Comment upon their morphological adaptations</li> </ul>
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