

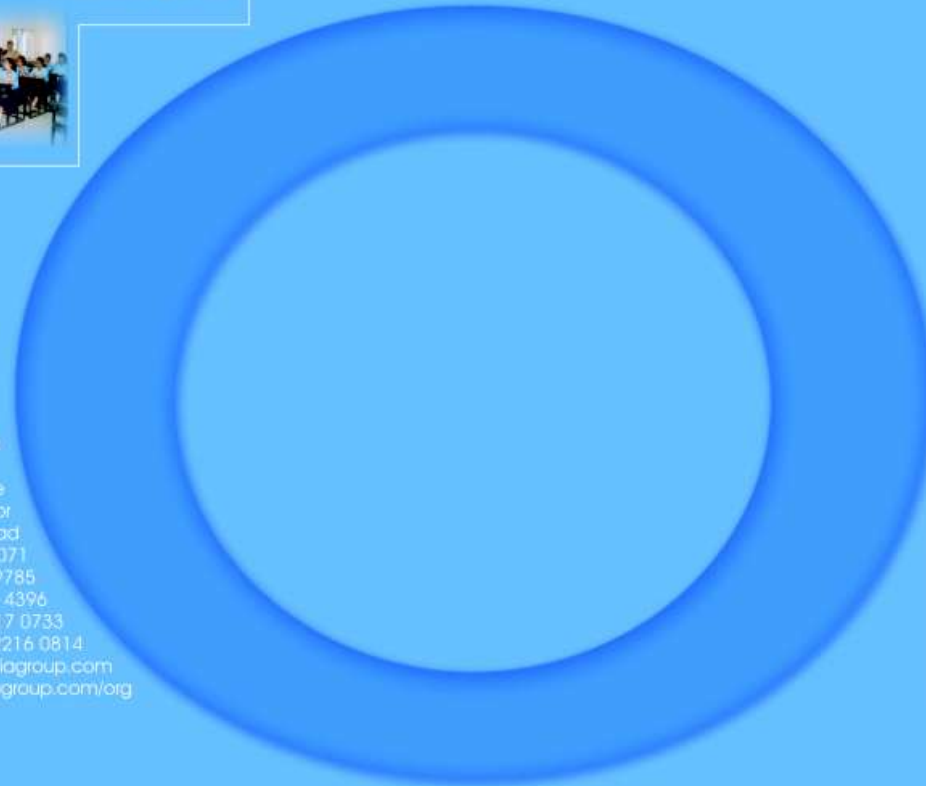


TECHNO INDIA™ GROUP



PROSPECTUS

TECHNO MODEL SCHOOL



Corporate Office:

Chatterjee International Centre
12th floor
33A, Chowringhee Road
Kolkata - 700 071
Phone: (+91 33) 2226 9785
2226 4396
2217 0733
Telefax: (+91 33) 2216 0814
E-mail: info@technoindia.com
Website: www.technoindia.com/org

Techno India Group is one of the largest knowledge management groups providing **Education Service (Academia)** and **Technology Service**. It maintains eight campuses in India.

Indian Technology professionals have proved their mettle in the global market place. Government of West Bengal has taken a number of significant steps to ensure that the state is an integral part of this global activity. It has encouraged creation of engineering colleges as the core behind this movement. Institutions under the Techno India Group have been set up under this initiative.

TIG Academia has been established with the mission to achieve the status of a University and has promoted a number of Schools in these campuses.

TIG Technology Services has been further launched to conduct Research and Development, Manufacturing and other industrial activities.

The centralised Industry Institute Partnership Cell has been launched to collaborate with industry and to produce an effective fusion of these two different services of the group.

Large number of Techno India Group students have been successfully placed in Infosys, TCS, Microsoft, CTS, Wipro, Kanbay, Hutch, CMC, Reliance, TIL, BPL, HCL, RS Software, Price Waterhouse Coopers, Defence etc. and some have proceeded with higher studies in reputed institutions like IIM, IIT and in institutions apart from the named ones after qualifying successfully in CAT, GATE, GMAT, MAT, GRE and TOEFL. For providing effective placement and other industrial supports the group has collaborated with industry namely WEBEL, WAPCOS, HCL, INFOSYSTEMS, DPS, DESCON, TATA Honeywell, TIL, Blue Star, DGGA, Inc. Canada, Orients Infotech and as well with Central Michigan University.

Techno India Group stands to be the major employer of Technocrats in the region.

VISION : To create an enabling environment where technology is used for the benefit of mankind.
MISSION : To acquire, develop, transmit and use appropriate technology for physical and mental development of people.

TIG Academia Nursery to Ph.D

Education is provided through a number of special purpose schools. Each school has one or more institutions located at its campus. Each of the following schools specialize in an area of technology and work towards assimilation and dissemination of knowledge on that technology. The technology areas are chosen for their strength in improving quality of life in terms of mental and physical health and economic prosperity.

- ◆ TIG Public School (Nursery to Class X)
- ◆ TIG Model School (Class XI & XII)
- ◆ TIG Technology School (B.Tech, M.Tech)
- ◆ TIG Business School (MBA, BBA)
- ◆ TIG IT School (MCA, BCA, DOEACC - O, A, B, C Level)
- ◆ TIG Para - Medical School (B.Optom, BHM)
- ◆ TIG Finishing School (Grooming for Placement & Higher Studies)
- ◆ TIG R & D School (Ph.D.)



NETAJI SUBHASH ENGINEERING COLLEGE CAMPUS

Near Garia Railway Station, Kolkata - 700 084
Phone : (033) 2436 3333 / 1285,
Fax : (033) 2436 1286
Website : www.nsecollege.org



BENGAL INSTITUTE OF TECHNOLOGY CAMPUS

Tech Town, Dhapa Manpur on Basanti Highway
Hadia, Kolkata - 700 150
Phone : (033) 2345 8001 / 8004
Fax : (033) 2345 8005
Website : www.bitcollege.org



MEGHNAD SAHA INSTITUTE OF TECHNOLOGY CAMPUS

Techno Complex, Madurclaha, Beside NRI Complex
Uchhepota, Kolkata - 700 150
Phone : (033) 2443 1031, Fax : (033) 2443 1032
Website : www.msitcollege.org



TECHNO INDIA CAMPUS

EM 4/1, Sector V, Salt Lake (Karunamoyee)
Kolkata - 700 091
Phone : (033) 2357 5683 / 5684
Fax : (033) 2357 5686
Website : www.ticcollege.org



ASANSOL ENGINEERING COLLEGE CAMPUS (IV)

Sen Raleigh Road, Kanyapur, Asansol - 713304
Phone : (0341) 225 1426 / 225 2108
Fax : (0341) 225 3056
Website : www.aeccollege.org



SILIGURI INSTITUTE OF TECHNOLOGY CAMPUS

Hill Cart Road, P.O. : Sukna, Siliguri,
Dist. : Darjeeling - 734225
Phone : (0353) 277 8002 / 8004
Fax : (033) 277 8003
Website : www.sitcollege.org



TECHNO INDIA HOOGHLY CAMPUS

Khadinamore, Hooghly, Pin - 712101
Phone : 2680 2389
Website : www.ticcollege-hooghly.org



TECHNO INDIA COLLEGE OF TECHNOLOGY CAMPUS

Rajarhat, New Town, Kolkata - 700 156
Phone : (033) 2706 2050
Website : www.tictcollege.org



TECHNO INDIA GROUP PUBLIC SCHOOL

Hooghly : 2680 4753 ; Garia : (033) 2436 7991;
Siliguri : (0353) 55 33533



TECHNO INDIA INSTITUTE OF TECHNOLOGY

Chatterjee International Centre, 10th Floor,
33A, Chowringhee Road, Kolkata - 700 071
Phone : 2271 0733
Website : www.tiitcollege.org



TECHNO MODEL SCHOOL

Garia : (033) 2436 4028
Salt Lake : (033) 2357 5685
Siliguri : (0353) 2778005



TECHNO INDIA TECHNOLOGIES LTD.

Kolkata : Chatterjee International Centre,
12th Floor, 33A, Chowringhee Road
Pin - 700071
Phone : 2217 7069
New Delhi : Sampla, Phone : 0162 - 263344



THE INSTITUTE OF COMPUTER ENGINEERS (INDIA)

(Associated with 73 University / College Computer Centres in West Bengal & Tripura)
Chatterjee International Centre, 15th Floor, 33A, Chowringhee Road,
Kolkata - 700 071, Phone : 2217 6044
Website : www.iceonline.org



Preamble

Fittest will survive is an old saying but is still true in the present day World.

Techno Model Schools are co-educational higher secondary schools affiliated to West Bengal Council of Higher Secondary Education established with the sole objective of grooming youngsters to excel in a fiercely competitive and complex world by providing them with the power of knowledge and skills through carefully selected curricular and Co-curricular programmes. Rigorous teaching and intensive training will be a part of regular school activities for the benefit of all the students aspiring for a bright career.

These Schools recognise the fact that Human Excellence is hidden in every student and hence in a pioneering effort, provide a stimulating and congenial learning atmosphere in them, so as to give the students a leading edge over others. These schools are member of the Techno India Group - a consortium of Engineering Colleges and the group intends to develop highly skilled manpower in all the emerging areas of Technology.

Let each student who pass out of these schools serve as a beacon light in this troubled world so that the world becomes a better place to live in than it is today.

TECHNO MODEL SCHOOL

School I at : Netaji Subhash Engineering College Campus
Near Garia Rly. Station, Kolkata - 700 152
Phone : (033) 2436 4028/ 7949/ 7991

School II at : Techno India Campus
EM-4/1, Sector V, Salt Lake, (Near Nicco Park / Karunamoyee),
Kolkata - 700 091
Phone : (033) 2357 5685/ 84

School III at : Siliguri Institute of Technology Campus
Hill Cart Road, Siliguri, Darjeeling - 734225
Phone : (0353) 277 8005

Website : www.technomodelschool.org

Email : info@technomodelschool.org





PROSPECTUS

AIMS & OBJECTIVES :

TECHNO MODEL SCHOOL aims at the total development of the student with special emphasis on intellectual and moral growth.

In order to achieve this, we at Techno Model School strive to:

- ▶ Inculcate in every student a spirit of excellence in academics and life.
- ▶ Create a notion in every student to lead a life based on firm principles and high moral values.
- ▶ Prepare every student to be at service to society and nation.
- ▶ Create a sense of responsibility, dedication, character, ethical practices and honesty in every student.



LOCATIONS :

The Schools are located in the Engineering College Campuses at Garia, Salt Lake and Siliguri creating a unique environment for education.

AFFILIATION :

Techno Model Schools are affiliated to the West Bengal Council of Higher Secondary Education as Co-educational institutions with English as the medium of instruction.

MANAGEMENT :

Techno Model Schools are member of Techno India Group, one of the largest knowledge management groups of the country. The Management of the Schools is vested with a duly constituted Governing Body comprising of eminent academicians, administrators, technologists, social workers and philanthropists in pursuit of excellence.

BUILDING & INFRASTRUCTURE :

All Techno Model Schools are designed and built by renowned architects and engineers with proper facilities, modern class rooms, well equipped laboratories, library and reading room with adequate numbers of text books, reference books, magazines and journals, computer laboratory with latest servers & terminals with INTERNET accessibility and standby generator.

FACULTY :

Teachers are the most important factor in the success of the learner. All the Techno Model Schools are fortunate to have highly qualified, experienced, competent, committed and well motivated faculty members. Each subject has a separate department with adequate number of qualified and dedicated teachers. Each department on the basis of its strength, finalised the schedule of classes and the faculty members have their own system of self evaluation. The performance of the faculty members are periodically assessed by the academic council for the respective year.



PROSPECTUS



ELIGIBILITY FOR ADMISSION :

Students who have successfully completed class X Examination conducted by West Bengal Board of Secondary Education or its equivalent examination conducted by other recognised Boards/Authorities are eligible for admission into Class XI.

Admission can be granted to students coming from outside India after obtaining requisite permission from W.B.H.S. Council that normally grants such permission after determining the equivalence of the examination passed by the overseas students.

ADMISSION PROCEDURE :

Admission notices are issued by the School by way of advertisements in leading Newspapers so as to coincide with publication of results of Secondary School Exams.

The application has to be made in prescribed form to be purchased from the respective school office during working hours on payment of necessary cost or download from our website www.technomodelschool.org. The admission is strictly based on merit to be assessed on the basis of performance of the student in Class IX/X and subsequent interview conducted by the admission council appointed by the School Management. Since the seats are limited the general mode of admission will be uniform in all the Schools and any sort of canvassing or any reported attempt to influence the admission council will automatically disqualify the student.

The applications made in any form other than the one purchased from the School will be summarily rejected. Failure to furnish the required information or enclose the required documents will make the application liable for rejection. However, application can be purchased from any one School of the three Schools.

Guardians/students are welcome to visit the respective School office for any further clarification or information regarding the admission timing and procedures to be followed.

In all matters regarding admission, the decision of the admission council will be final and binding on all concerned.

CO-CURRICULAR ACTIVITIES :

The School gives adequate importance to Co-curricular activities for overall mental and Physical growth of the students. Physical training and games are compulsory for all students unless medically advised or physically handicapped.

The Students are given opportunities to nurture their talent in the following disciplines through individual/group activities.

- | | |
|-------------------------------------|--------------------|
| ▶ Music (Vocal/Instrumental) | ▶ Debate |
| ▶ Painting | ▶ Creative Writing |
| ▶ Elocution (English/Bengali/Hindi) | |
| ▶ Quiz | ▶ Dance |





PROSPECTUS

SYLLABUS :

The School strictly follows the Syllabus prescribed by the West Bengal Council of Higher Secondary Education.

ACADEMIC EVALUATION :

A Student having less than 70% attendance will not be granted promotion to Class-XII. Parents are requested to keep a watch on the attendance of their wards, as intimated through the progress reports.

A student who secures less than 40% marks on an average in the exams conducted during the academic session will not be granted promotion to Class-XII or will not be selected for appearing in the H.S. Exams.

Students are issued report cards after every terminal examination which are required to be returned to the Class Teacher signed by the guardian as directed.

Students who fail in the selection test will not be allowed to appear for the Board examination.

UNIFORM :

In order to bring about unity among students and to instill a sense of belonging, all Techno Model Schools have implemented a uniform code for the students, similar to that of the engineering colleges.

Boys : Navy Blue Trousers with Sky Blue Shirts (with the school monogram), Navy Blue Ties with Sky Blue Stripes, black shoes and white socks.

Girls : The same as boys. Option - Navy Blue Skirts with Sky Blue Tops.

Winter Uniform : Sky Blue Blazer with School Monogram

BUS SERVICE :

Bus services will be available from selected convenient points only against payment of necessary charges.

IDENTITY CARD :

Each student will be issued a school identity card which he/she must possess while coming to school. Safe custody of the identity card is the responsibility of the student. In case of loss of identity card, duplicate Card will be issued only on payment of Rs. 50 with a letter of explanation and the copy of Police FIR.

PROSPECTUS



PRIZES / AWARDS / SCHOLARSHIPS :

The School management gives prizes/awards/scholarships to deserving students during the course of study or after the results are published. The scheme for each year will be published through a circular and displayed on the School notice board as per the policy and decision of the management.

CAREER DEVELOPMENT :

The School has a scheme and system for coaching the students for competitive exams. During the course of studies itself guidance is given for preparation for JEE, AIEEE, IIT etc. depending upon the merit of the student.

The School makes in-house assessment to study the aptitude of the students. In accordance with the talent, nature, aptitude and interest of the student, guidance is given to prepare for his/her future course of action enabling the student to move forward in the direction best suited to each one of them.

Experts in the career guidance and industry leaders visit the School and talk to students on their career options before the end of the session.

DISCIPLINE :

1. No student shall leave the class during school/class hours, without permission.
2. Students must always respect their teachers and elders.
3. Misconduct and disrespect towards any staff of this institution will result in very serious disciplinary action.
4. Strict discipline must be maintained inside the class room. During recess and between study periods also, pupil's behaviour will be subjected to examination and correction.
5. Any student damaging School property or indulging in malpractices is liable to be removed from the School.
6. During the School hours no student shall participate in any activity, outside the School without the knowledge and written permission of the Principal.
7. Ragging in any form inside or outside the school premises is strictly prohibited.
8. Students found involved in ragging will be severely dealt with as per State Government rule. Fine, suspension or dismissal are some punishments which the Principal can enforce.





SYLLABUS

CURRICULUM OF WEST BENGAL HIGHER SECONDARY COUNCIL SCIENCE STREAM

বাংলা 'ক' পাঠ্যক্রম
পূর্ণ মান-১০০ একাদশ শ্রেণী
 পদার্থ্যে ২০

পদ্মাবতীর বিবাহমঙ্গল : সৈয়দ আলীগঞ্জ, আঘা কিলান ও মধুসূদন দত্ত, নবাব : যতীন্দ্রনাথ সেনগুপ্ত, বর্নমালা, আনার দুর্ধিমা বর্নমালা : শামসুর রাহমান
 গদ্যার্শে ২০

ইন্দ্রপাতের মেয়ে : বঙ্কিমচন্দ্র চট্টোপাধ্যায়, তোতাচাকহিনী : রবীন্দ্রনাথ ঠাকুর, পুত্র জাগরণ : স্বামী বিবেকানন্দ

নাটক ১০
 ঝাঁপের রানির শেষ যুদ্ধ : তুষ্টি মিত্র, পাপ-পুণ্য : রবীন্দ্রনাথ ঠাকুর
 ছোটগল্প ১০

শ্রীপতি সামন্ত : কনকলা, চতুর্থ পালিনাথের যুদ্ধ : সুবোধ ঘোষ
সাহিত্যের ইতিহাস (১ম-১৭তম অধ্যায়)

প্রস্তাবনা : (১) বাংলা ভাষার বিকাশের আগে বাঙালি কবিদের সাহিত্যচর্চার সংক্ষিপ্ত বিবরণ, বাংলা সাহিত্যের যুগবিভাগ : আদি, মধ্য ও আধুনিক।
আদি যুগ - (২) চর্যাপদ : ঐতিহাসিক গুরুত্ব, সামগ্রিক সাহিত্যমূল্য, কল্পকল্পন প্রদান করির নাম। **মহাযুগ - (৩)** তুর্কি আগমন ও তার সামাজিক-সাংস্কৃতিক পরিমাণ। (৪) শ্রীকৃষ্ণকীর্তন এবং বৈষ্ণব পদাবলির সংক্ষিপ্ত পরিচয় (আলোচ্য কবি — বিদ্যাপতি, চণ্ডীদাস, জ্ঞানদাস ও গোবিন্দদাস)। (৫) অনুবাস-কাব্য : রামায়ণ, ভাগবত ও মহাভারতের অনুবাস সম্বন্ধে সংক্ষিপ্ত আলোচনা। (৬) মঙ্গলকাব্য রচনার সামাজিক কারণ ও মঙ্গলকাব্যের সাধারণ বৈশিষ্ট্য। (৭) তিন মঙ্গলকাব্যের সংক্ষিপ্ত কাহিনি ও তিন বিশিষ্ট কবির (মুকুন্দ চক্রবর্তী, কেতকদাস প্রেমচন্দ্র ও ঘনরাম চক্রবর্তী) সংক্ষিপ্ত পরিচয়। (৮) বাঙালির সমাজ ও সাহিত্য চৈতন্যের আবির্ভাবের গুরুত্ব। (৯) দুই প্রধান চৈতন্যজীবনী কাব্যের (বৃন্দাবন দাস ও কৃষ্ণদাস কবিরাজ) সাধারণ পরিচয় ও ঐতিহাসিক গুরুত্ব। (১০) আরাকান রাজসভার কবিরের কাব্যচর্চার গুরুত্ব, সৌন্দর্য কবি ও সৈয়দ আলীগঞ্জ সম্পর্কে সংক্ষিপ্ত আলোচনা। (১১) অষ্টদশ শতাব্দীর যুগশৈশি, যুগের স্বেচ্ছিক ভারতচন্দ্র ও গ্রামসভার কাব্যচর্চার সংক্ষিপ্ত পরিচয়। **আধুনিক যুগ - (ক)** **উনবিংশ শতাব্দী - (১২)** নবজাগরণের সংক্ষিপ্ত ইতিহাস : বাঙালির সমাজ ও সাহিত্যে তার প্রভাব। (১৩) গদ্যসাহিত্য : (ক) প্রধান ধারা - ফোর্ট উইলিয়াম কলেজের লেখকগোষ্ঠী (নামোদ্রেক করে সাধারণ পরিচয় ঈশ্বরচন্দ্র বিদ্যাসাগর, বঙ্কিমচন্দ্র), (খ) বিকল্প ধারা : ছত্তোপাচার নন্দন। (১৪) বাংলা সাহিত্যচর্চার আধুনিকীকরণে ছাপাখানা, সংবাদপত্র ও সাময়িক পত্রের ভূমিকা : সংবাদ প্রভাকর, বঙ্গবর্নন - সংক্ষিপ্ত পরিচয়। (১৫) কাব্য : (ক) মহাকাব্য ও আখ্যান কাব্য : সাধারণ পরিচয় মধুসূদন সম্বন্ধে বিশেষ আলোচনা। (খ) গীতিশাস্ত্র : (সংক্ষেপে লিরিকের শৈশি) আলোচনা। এই শাখার নানা কবির নামোদ্রেক করে বিহারীলাল ও তাঁর দুজন প্রধান অনুশাসীর কাব্যচর্চার সংক্ষিপ্ত পরিচয়। (১৬) নাটক : মধুসূদন দত্ত, সীনবন্ধু মিত্র, তিরিশকল্প ঘোষ। (১৭) কথাসাহিত্য : (ক) প্রধান ধারা - বঙ্কিমচন্দ্রের বিশেষ আলোচনা, (খ) বিকল্প ধারা - তারকনাথ গঙ্গোপাধ্যায়, ত্রৈলোক্যনাথ মুখোপাধ্যায়।

পূর্ণ মান-১০০ একাদশ শ্রেণী
 পদার্থ্যে ২০

আমার দুর্গোৎসব : বঙ্কিমচন্দ্র চট্টোপাধ্যায়, ভাষিকার প্রবেশ : রবীন্দ্রনাথ ঠাকুর
 গদ্যার্শে ২০

বদভূমির প্রতি : মধুসূদন দত্ত, হত্যাকাণ্ডের গান : রবীন্দ্রনাথ ঠাকুর, মানুষ : নজরুল ইসলাম

নাটক ১০
 ঝাঁপের রানির শেষ যুদ্ধ : তুষ্টি মিত্র, পাপ-পুণ্য : রবীন্দ্রনাথ ঠাকুর
 ছোটগল্প ১০

শ্রীপতি সামন্ত : কনকলা, চতুর্থ পালিনাথের যুদ্ধ : সুবোধ ঘোষ
সাহিত্যের ইতিহাস (১ম-১৭তম অধ্যায়)

প্রস্তাবনা : (১) বাংলা ভাষার বিকাশের আগে বাঙালি কবিদের সাহিত্যচর্চার সংক্ষিপ্ত বিবরণ, বাংলা সাহিত্যের যুগবিভাগ : আদি, মধ্য ও আধুনিক।
আদি যুগ - (২) চর্যাপদ : ঐতিহাসিক গুরুত্ব, সামগ্রিক সাহিত্যমূল্য, কল্পকল্পন প্রদান করির নাম। **মহাযুগ - (৩)** তুর্কি আগমন ও তার সামাজিক-সাংস্কৃতিক পরিমাণ। (৪) শ্রীকৃষ্ণকীর্তন এবং বৈষ্ণব পদাবলির সংক্ষিপ্ত পরিচয় (আলোচ্য কবি — বিদ্যাপতি, চণ্ডীদাস, জ্ঞানদাস ও গোবিন্দদাস)। (৫) অনুবাস-কাব্য : রামায়ণ, ভাগবত ও মহাভারতের অনুবাস সম্বন্ধে সংক্ষিপ্ত আলোচনা। (৬) মঙ্গলকাব্য রচনার সামাজিক কারণ ও মঙ্গলকাব্যের সাধারণ বৈশিষ্ট্য। (৭) তিন মঙ্গলকাব্যের সংক্ষিপ্ত কাহিনি ও তিন বিশিষ্ট কবির (মুকুন্দ চক্রবর্তী, কেতকদাস প্রেমচন্দ্র ও ঘনরাম চক্রবর্তী) সংক্ষিপ্ত পরিচয়। (৮) বাঙালির সমাজ ও সাহিত্য চৈতন্যের আবির্ভাবের গুরুত্ব। (৯) দুই প্রধান চৈতন্যজীবনী কাব্যের (বৃন্দাবন দাস ও কৃষ্ণদাস কবিরাজ) সাধারণ পরিচয় ও ঐতিহাসিক গুরুত্ব। (১০) আরাকান রাজসভার কবিরের কাব্যচর্চার গুরুত্ব, সৌন্দর্য কবি ও সৈয়দ আলীগঞ্জ সম্পর্কে সংক্ষিপ্ত আলোচনা। (১১) অষ্টদশ শতাব্দীর যুগশৈশি, যুগের স্বেচ্ছিক ভারতচন্দ্র ও গ্রামসভার কাব্যচর্চার সংক্ষিপ্ত পরিচয়। **আধুনিক যুগ - (ক)** **উনবিংশ শতাব্দী - (১২)** নবজাগরণের সংক্ষিপ্ত ইতিহাস : বাঙালির সমাজ ও সাহিত্যে তার প্রভাব। (১৩) গদ্যসাহিত্য : (ক) প্রধান ধারা - ফোর্ট উইলিয়াম কলেজের লেখকগোষ্ঠী (নামোদ্রেক করে সাধারণ পরিচয় ঈশ্বরচন্দ্র বিদ্যাসাগর, বঙ্কিমচন্দ্র), (খ) বিকল্প ধারা : ছত্তোপাচার নন্দন। (১৪) বাংলা সাহিত্যচর্চার আধুনিকীকরণে ছাপাখানা, সংবাদপত্র ও সাময়িক পত্রের ভূমিকা : সংবাদ প্রভাকর, বঙ্গবর্নন - সংক্ষিপ্ত পরিচয়। (১৫) কাব্য : (ক) মহাকাব্য ও আখ্যান কাব্য : সাধারণ পরিচয় মধুসূদন সম্বন্ধে বিশেষ আলোচনা। (খ) গীতিশাস্ত্র : (সংক্ষেপে লিরিকের শৈশি) আলোচনা। এই শাখার নানা কবির নামোদ্রেক করে বিহারীলাল ও তাঁর দুজন প্রধান অনুশাসীর কাব্যচর্চার সংক্ষিপ্ত পরিচয়। (১৬) নাটক : মধুসূদন দত্ত, সীনবন্ধু মিত্র, তিরিশকল্প ঘোষ। (১৭) কথাসাহিত্য : (ক) প্রধান ধারা - বঙ্কিমচন্দ্রের বিশেষ আলোচনা, (খ) বিকল্প ধারা - তারকনাথ গঙ্গোপাধ্যায়, ত্রৈলোক্যনাথ মুখোপাধ্যায়।

বাঁকাপরিবর্তন/উক্তি পরিবর্তন ৫
 প্রবাস-প্রবচন ও বাগধারা ৫
 অনুবাদ ৫

গল্প রচনা/পত্র রচনা/সংলাপ রচনা/প্রতিবেদন রচনা ১০

পূর্ণ মান-১০০ দ্বাদশ শ্রেণী
 পদার্থ্যে ২০

ওরা কাজ করে : রবীন্দ্রনাথ ঠাকুর, আমার কৈফিয়ত : নজরুল ইসলাম, আঠারো বছর বয়স : সুকান্ত ভট্টাচার্য, রাজা কার ও একার নয় : বীরেন্দ্র চট্টোপাধ্যায়
 গদ্যার্শে ২০

মানবতন্ত্র : আবুল ফজল, শিল্পী : মানিক বন্দ্যোপাধ্যায়, শব্দের আশীর্বাদ, শব্দের আকিঞ্চিপ : জা : আবিরলাল মুখোপাধ্যায়।

ছোটগল্প ১০
 ছোটগল্প : রবীন্দ্রনাথ ঠাকুর, একটি তুলসী গাছের কাহিনি : সৈয়দ ওয়ালীউল্লাহ
সাহিত্যের ইতিহাস ১৫

নিংশ শতাব্দী : (১৮) এই শতাব্দীর প্রধান প্রধান ঐতিহাসিক ঘটনা, বাঙালির সমাজজীবনে ও সাহিত্যচর্চার খেতলির বিশেষ প্রভাব পড়েছে; সংক্ষিপ্ত বিবরণ (বিভিন্ন রাজনৈতিক আন্দোলন, দুটি বিশ্বযুদ্ধ, মধ্যস্থত ও দেশভাগ - আলোচনায় এই চারটি বিষয়কে প্রধান দিতে হবে)। (১৯) কাব্য : সংক্ষিপ্ত বিবরণ ও বিভিন্ন প্রবণতার সাধারণ পরিচয়, (ক) রবীন্দ্রনাথ : প্রগতিশীল আনুমানিক পলক বিভাগ করে আলোচনা, (খ) রবীন্দ্রচন্দ্র : নজরুল ইসলাম, যতীন্দ্রনাথ সেনগুপ্ত, মোহিতলাল মজুমদার, (গ) রবীন্দ্রচন্দ্র : জীবনানন্দ দাস, সুবীন্দ্রনাথ দত্ত, সুভাষ মুখোপাধ্যায়। (২০) গদ্যসাহিত্য : সংক্ষিপ্ত পর্যালোচনা - রবীন্দ্রনাথ, প্রমথ চৌধুরী। (২১) কথাসাহিত্য : (উপন্যাস ও ছোটগল্প) সংক্ষিপ্ত পর্যালোচনা : রবীন্দ্রনাথ, শরৎচন্দ্র, তারাশঙ্কর, মানিক বন্দ্যোপাধ্যায়, বিকৃতিকৃষ্ণ বন্দ্যোপাধ্যায়, পরশুরাম, প্রেমেন্দ্র মিত্র, বনমূল বিশ্বশ্রীভাণ্ডার উপন্যাসগোষ্ঠী। (২২) নাটক : সংক্ষিপ্ত বিবরণ, (ক) জলিত ধারার নাটক : ষিঙ্কলসারায়, ফীয়েদেলসার বিদ্যালয়সেল, (খ) রবীন্দ্রনাটক, (গ) গদ্যনাট্য ও নন্দনাট্য : বিভূতিভট্টাচার্য, উৎপল দত্ত। (২৩) সাময়িক পত্র : সবুজপত্র, কল্যাণ, পরিচয় (প্রতি ক্ষেত্রে প্রকাশের কালসীমা, বৈশিষ্ট্য ও লেখকগোষ্ঠীর সংক্ষিপ্ত বিবরণ)।

পরিভাষা ৫
 প্রবন্ধ রচনা ১৫

বাংলা ভাষার সংক্ষিপ্ত ইতিহাস ১০

(ক) ভারতের ৪টি ভাষাংশে : সংক্ষিপ্ত পরিচয়। (খ) ভারতীয় আর্থভাষার ক্রমবিকাশের তিনটি স্তর — সংক্ষিপ্ত পরিচয়। (গ) নব্য ভারতীয় আর্থভাষার শাখা-প্রশাখা : সংক্ষিপ্ত পরিচয়। (ঘ) প্রাচীন ভারতীয় আর্থভাষা থেকে বাংলা ভাষার ক্রমবিকাশের সর্বল পথপ্রদর্শক। (ঙ) বাংলা ভাষার যুগবিভাগ : ভাষা ও উপভাষার সম্পর্ক; বাংলার মৌখিক ও সাহিত্যিক উপভাষা; মৌখিক উপভাষার স্থান ও লক্ষণ; সাহিত্যিক গদ্য উপভাষার (চলিত, সাধু) বিবর্তন ও তুলনা।

ছন্দ ৫
 বাংলা 'খ' বিভাগ
 একাদশ শ্রেণী
 পদার্থ্যে ২০

আমার দুর্গোৎসব : বঙ্কিমচন্দ্র চট্টোপাধ্যায়, ভাষিকার প্রবেশ : রবীন্দ্রনাথ ঠাকুর
 গদ্যার্শে ২০

বদভূমির প্রতি : মধুসূদন দত্ত, হত্যাকাণ্ডের গান : রবীন্দ্রনাথ ঠাকুর, মানুষ : নজরুল ইসলাম

নাটক ১০
 ঝাঁপের রানির শেষ যুদ্ধ : তুষ্টি মিত্র, পাপ-পুণ্য : রবীন্দ্রনাথ ঠাকুর
 ছোটগল্প ১০

শ্রীপতি সামন্ত : কনকলা, চতুর্থ পালিনাথের যুদ্ধ : সুবোধ ঘোষ
সাহিত্যের ইতিহাস (১ম-১৭তম অধ্যায়)

প্রস্তাবনা : (১) বাংলা ভাষার বিকাশের আগে বাঙালি কবিদের সাহিত্যচর্চার সংক্ষিপ্ত বিবরণ, বাংলা সাহিত্যের যুগবিভাগ : আদি, মধ্য ও আধুনিক।
আদি যুগ - (২) চর্যাপদ : ঐতিহাসিক গুরুত্ব, সামগ্রিক সাহিত্যমূল্য, কল্পকল্পন প্রদান করির নাম। **মহাযুগ - (৩)** তুর্কি আগমন ও তার সামাজিক-সাংস্কৃতিক পরিমাণ। (৪) শ্রীকৃষ্ণকীর্তন এবং বৈষ্ণব পদাবলির সংক্ষিপ্ত পরিচয় (আলোচ্য কবি — বিদ্যাপতি, চণ্ডীদাস, জ্ঞানদাস ও গোবিন্দদাস)। (৫) অনুবাস-কাব্য : রামায়ণ, ভাগবত ও মহাভারতের অনুবাস সম্বন্ধে সংক্ষিপ্ত আলোচনা। (৬) মঙ্গলকাব্য রচনার সামাজিক কারণ ও মঙ্গলকাব্যের সাধারণ বৈশিষ্ট্য। (৭) তিন মঙ্গলকাব্যের সংক্ষিপ্ত কাহিনি ও তিন বিশিষ্ট কবির (মুকুন্দ চক্রবর্তী, কেতকদাস প্রেমচন্দ্র ও ঘনরাম চক্রবর্তী) সংক্ষিপ্ত পরিচয়। (৮) বাঙালির সমাজ ও সাহিত্য চৈতন্যের আবির্ভাবের গুরুত্ব। (৯) দুই প্রধান চৈতন্যজীবনী কাব্যের (বৃন্দাবন দাস ও কৃষ্ণদাস কবিরাজ) সাধারণ পরিচয় ও ঐতিহাসিক গুরুত্ব। (১০) আরাকান রাজসভার কবিরের কাব্যচর্চার গুরুত্ব, সৌন্দর্য কবি ও সৈয়দ আলীগঞ্জ সম্পর্কে সংক্ষিপ্ত আলোচনা। (১১) অষ্টদশ শতাব্দীর যুগশৈশি, যুগের স্বেচ্ছিক ভারতচন্দ্র ও গ্রামসভার কাব্যচর্চার সংক্ষিপ্ত পরিচয়। **আধুনিক যুগ - (ক)** **উনবিংশ শতাব্দী - (১২)** নবজাগরণের সংক্ষিপ্ত ইতিহাস : বাঙালির সমাজ ও সাহিত্যে তার প্রভাব। (১৩) গদ্যসাহিত্য : (ক) প্রধান ধারা - ফোর্ট উইলিয়াম কলেজের লেখকগোষ্ঠী (নামোদ্রেক করে সাধারণ পরিচয় ঈশ্বরচন্দ্র বিদ্যাসাগর, বঙ্কিমচন্দ্র), (খ) বিকল্প ধারা : ছত্তোপাচার নন্দন। (১৪) বাংলা সাহিত্যচর্চার আধুনিকীকরণে ছাপাখানা, সংবাদপত্র ও সাময়িক পত্রের ভূমিকা : সংবাদ প্রভাকর, বঙ্গবর্নন - সংক্ষিপ্ত পরিচয়। (১৫) কাব্য : (ক) মহাকাব্য ও আখ্যান কাব্য : সাধারণ পরিচয় মধুসূদন সম্বন্ধে বিশেষ আলোচনা। (খ) গীতিশাস্ত্র : (সংক্ষেপে লিরিকের শৈশি) আলোচনা। এই শাখার নানা কবির নামোদ্রেক করে বিহারীলাল ও তাঁর দুজন প্রধান অনুশাসীর কাব্যচর্চার সংক্ষিপ্ত পরিচয়। (১৬) নাটক : মধুসূদন দত্ত, সীনবন্ধু মিত্র, তিরিশকল্প ঘোষ। (১৭) কথাসাহিত্য : (ক) প্রধান ধারা - বঙ্কিমচন্দ্রের বিশেষ আলোচনা, (খ) বিকল্প ধারা - তারকনাথ গঙ্গোপাধ্যায়, ত্রৈলোক্যনাথ মুখোপাধ্যায়।

বাঁকাপরিবর্তন/উক্তি পরিবর্তন ৫
 প্রবাস-প্রবচন ও বাগধারা ৫
 অনুবাদ ৫

গল্প রচনা/পত্র রচনা/সংলাপ রচনা/প্রতিবেদন রচনা ১০

সবক ও লিঙ্গা : রবীন্দ্রনাথ ঠাকুর, দিন রক্তিত : বিকৃতিকৃষ্ণ মুখোপাধ্যায়

SYLLABUS

পদার্থ্যে ২০
 বাংলার মুখ আমি দেখিছি : জীবনানন্দ দাস, নবাব : যতীন্দ্রনাথ সেনগুপ্ত, নিম্নোক্তের গান : সুকান্ত ভট্টাচার্য
 প্রবাস ও প্রবচন ১০
 প্রবন্ধ রচনা ২০
 শব্দসীমা অনধিক ৩০০ শব্দ
 ভাষা-সংক্রান্ত/সংক্ষিপ্তসার/পত্র রচনা/প্রতিবেদন রচনা ১৫

যে কোন একটি
 বঙ্গানুবাদ ১০
 পরিভাষা ৫

HINDI SYLLABUS (GROUP A) হিন্দি পদ্যক্রম (ক)

পূর্ণ সংখ্যা - ১০০ একাদশ শ্রেণী
 যথ - ৩০

(ক) নিম্ন - (১) কবিলা ক্যা হি ? রামচন্দ্রযুক্ত (Page No. 3 to 6 upto... জো মুর্টে অঁর মোহর হোঁ), (২) বিকলাগ ব্রহ্ম কা পঁর : হরিশঙ্কর পরসাই
 (খ) কহানী - (১) আকাশদীপ : জয়শঙ্কর প্রসাদ, (২) সর্বাঙ্গী : কালীদাস চৌর : মালিন্দা শর্ম।
 (গ) একাকী - (১) লক্ষী কা স্মরণাত : উপেন্দ্রনাথ অরক।
 কব্য - ২০

(১) মীরা - পদ সংখ্যা ১ সে ৫। (২) সুরদাস - বাসন্ত্য কে ৫ পদ : ১ সে ৫, মরবীর কে ৫ পদ : ১ সে ৪। (৩) বিহারী - দোহা সংখ্যা ১ সে ১০। (৪) নিরাল - বাদল রানু, অমী ন হোঁগ মেরা অন। (৫) রাম ঘরী শিল দিনকর - পরেশ্বর, কলম আজ তনকী জয় বোল। (৬) সুমিত - মাধবীর।

হিন্দি সাহিত্য কা ইতিহাস - ২০

(১) খড়ী বোলী হিন্দি কা বিকাশ : সঙ্ক্ষিপ্ত বিবরণ। (২) হিন্দি নব্যজাগরণ, ভারতেন্দু যুগিন সাহিত্যে কী প্রভুতিয়া, দ্বিবৈদী যুগ (প্রমুখ লেখক - ভারতেন্দু হরিশঙ্কর, বালকৃষ্ণ মটর, মহাবীর প্রসাদ দ্বিবৈদী, বালমুকুন্দ জুল)। (৩) জায়াবীর কী বিশিষ্টতা (প্রমুখ কবি - প্রসাদ, নিরাল, পঁর অঁর মহাবীরী বর্ম)। (৪) প্রগতিশীল সাহিত্যে কা আন্দোলন, প্রমুখ বিরোধিতা অঁর প্রমুখ লেখক (প্রমুখ, যশপাল, কাগার্জুন, রামকিশোর শর্ম)। (৫) নূরুজ্জামান সাহিত্যে প্রমুখ বিবরণ, মর্দ কহানী কী প্রমুখ বিশিষ্টতা (প্রমুখ লেখক - অজয় অঁর নির্মল বর্ম)। (৬) উপন্যাস অঁর নাটক কা উদ্ভব অঁর বিকাশ।

বিদ্যে লেখন - ১৫
প্রবন্ধ রচনা - ১৫

ব্যাকরণ (পদ্য পুস্তক পর জায়াবীর) - ১৫

(১) ব্যাকরণ সংগোহন, ব্যাকরণ পরিচয়, বচন, লিঙ্গ নির্ণয়, বচন, উপসর্গ, প্রত্যয়
পূর্ণ সংখ্যা - ১০০ দ্বাদশ শ্রেণী
 যথ - ৩০

(ক) নিম্ন - (১) পরেশ্বর : কুচ বিচার - কুচ প্রহন : হযামাকরণ দুবে, (২) ইন্ডিয় অফর পুন অঁর যুগ হৈ : নির্মল বর্ম।
 (খ) কহানী - (১) মঁর : প্রেমবর্ন, (২) রোজ : অজয়, (৩) ছুটুপাত : শীম সাহানী।
 (গ) একাকী - (১) মামী তরুহাছন : লক্ষী নারায়ণ লাল।

কব্য - ২০

(১) কবীর - দোহে (দোহা সংখ্যা ১ সে ১০) ৩ পদ - অঁর ইন্ডে দোহ রাহ ন মাই, তোকী যৌথ মিলেগে ঘুঘট কে পদ, মৌকী কহা তুটে বঁদে। (২) তুলসীদাস - (পাতয় পুস্তক মঁে দিহু মূ এলী পদ)। (৩) প্রসাদ - সে খল মুন্ডে মুলগা দেক, অরোকী কী পিতা। (৪) কাগার্জুন - বাদলে কী গিরতী দেক হৈ, সোশন কী বন্দুক। (৫) মুক্তিবাধ - জয় জন কা বেহের এক, মুক্তিবাধী সমাজ কে প্রতি। (৬) রঘুবীর সহায় - হরৌ হরৌ জল্ভী হরৌ, দে বিদ্যী জা হৈ।

সহায়ক পদ্য পুস্তক (কৌড় এক) - ২০

(১) নির্মলা (উপন্যাস) - প্রমবর্ন, (২) শূন্যতা কী কহিয়া (নিম্নব) - মহাবৈদী বর্ম, (৩) আশাভ কা এক দিন (নাটক) - মোহন রাখে।
 পরিমাণিক শব্দাবলী - ৫
 দ্বিগোষ্ঠী অধ্যয়ন পত্র লেখন ১০
 ব্যাকরণ - ২০

পদ্য পুস্তক পর জায়াবীর - (বচন, কারক বিহীন, সচি, সমাস, উপসর্গ, প্রত্যয়, জায় পরিচয়, ব্যাকরণ বিশেষণ, জায় সংগোহন।

HINDI SYLLABUS (GROUP B) হিন্দি পদ্যক্রম (খ)

পূর্ণ সংখ্যা - ১০০ একাদশ শ্রেণী
 যথ - ৩০

(ক) নিম্ন - (১) নাফুল ক্যো বচত হৈ ? : হজারী প্রসাদ দ্বিবৈদী। (২) রজিয়া : রামচন্দ্র বৈদী।
 (খ) কহানী - (১) পরসাদ : যশপাল। (২) আর্দা : মোহন রাখে।
 (গ) একাকী - (১) অধিকার কা রহক : উপেন্দ্রনাথ অরক। (।
 কব্য - ২০

(১) রহীম - ১ সে ১০ দোহে, (২) মীরা : ১ সে ৫ পদ, (৩) তুলসীদাস : ১ সে ৫ দোহে, (৪) জয়শঙ্কর প্রসাদ : হৈ সানার সংগ অরুণাশীল, অরুণ ঘট মধুময় দেশ হমার, (৫) রামসারী সিংহ দিনকর : সমর শেখ হৈ।

বিদ্যে লেখন - ১৫
হিন্দি সাহিত্য কা ইতিহাস - ২০

(ক) বীরনাথ কাল কী বিশিষ্টতা (প্রমুখ কবি : বন্দরবরদাই এঁর বিদ্যাপতি), (খ) মলিক কাল কী নির্ণয় অঁর সংলগ্ন চারাজী কী সামান্য বিশিষ্টতা (প্রমুখ কবি - কবীর, সূর, মীরা, তুলসী অঁর জায়সী) (গ) গীতিকাল কী সামান্য বিশিষ্টতা (প্রমুখ কবি : কেশবদাস, বিহারী অঁর ঘনানন্দ), (ঘ) আধুনিক কাল কী প্রমুখ প্রবৃতি - মার্ভতেন্দু-যুগ, জগদানন্দ-যুগ অঁর প্রগতিশীল সাহিত্য (সঙ্ক্ষিপ্ত বিবরণ)

ব্যাকরণ (ব্যাকরণ সংগোহন, লিঙ্গ, উপসর্গ, প্রত্যয়) - ১৫

পূর্ণ সংখ্যা - ১০০ দ্বাদশ শ্রেণী
 যথ - ৩০

(ক) নিম্ন - (১) সাহিত্য : মহাবীর প্রসাদ দ্বিবৈদী।
 (খ) কহানী - (১) হিন্দা পরমৌ ধর্ম : প্রেমবর্ন। (২) অপনা রাসতা লো বাহা : কাশীনাথ সিংহ।
 (গ) একাকী - (১) লিপিচিত্র কী মুকায়ন : চিণ্ডু প্রমাকর।
 কব্য - ২০

(১) কবীর : ১০ দোহে (সংখ্যা ১১ সে ২০), (২) সুরদাস : বাসন্ত্য কে ৫ পদ (সংখ্যা ৬ সে ১০), (৩) নিরাল-বৌদ্ধী পল্লব, জল্ভী জল্ভী পঁর বডাও, (৪) সুমিতা নন্দন পদ-প্রথম রশি, সংখ্যা কা ছুটুপদ, (৫) সর্ধেয়র দয়াল সর্কেনো : জাও কী যুপ, কনী মত করৌ মাছ।

পত্র / রিপোর্ট - ১০
পরিমাণিক শব্দাবলী - ৫

ব্যাকরণ (সমাস, সচি, কারক বিহীন, বচন, ব্যাকরণ সংগোহন - ২০
অনুবাদ - অংগী সে হিন্দি - ১৫

ENGLISH - A CLASS XI Full Marks 100 (80 Marks)

Prose, Novel and Poetry

Prose

a. Novel
 i. Things Fall Apart: Chinua Achebe
 ii. Short Stories and Non Fiction
 i. The Miracle of Purun Bhagat: R. Kipling, ii. The Million Dollar Bond Robbery : A. Christie, iii. The Story of Webster: PG Wodehouse, iv. The Earth: HE Bates, v. East and West: R. Tagore, vi. Hardy and Ramanujan: CP Snow, vii. Man's Environment: A. Alaby

Poetry

i. I walked the other day: H. Vaughan, ii. The Man of Ross: A Pope, iii. The Ravine of Poor Susan : W. Wordsworth, iv. When I have fears: J. Keats, v. The Oriole's Secret: E. Dickinson, vi. The Manhe killed: T. Hardy

Essay Writing (15 Marks)

Substance Writing (10 Marks)

Grammar (15 Marks)

i. Tense, ii. Voice, iii. Punctuation, iv. Group verbs, v. Preposition

SYLLABUS

| | |
|---|-----------------------|
| CLASS XII | Full Marks 100 |
| Drama and Poetry | (60 Marks) |
| Drama: Julius Caesar - William Shakespeare | |
| Poetry: i. The Last Lesson of the Afternoon: DH Lawrence, ii. The Force that through the green fuse: D. Thomas, iii. A Child III: J. Bejman, iv. Still I Rise: M. Angelou, v. A Lunch on the Train | |
| G. Deshpande | |
| ESP (any one Unit) | (15 Marks) |
| i. Picture Analysis, ii. Description of object, machine, process, iii. Writing a Project Report, iv. Copy Writing, v. Editing and Proof reading. | |
| Comprehension | (15 Marks) |
| Grammar | (10 Marks) |
| i. Synthesis and splitting of sentences, ii. Narration change, iii. Correction of errors. | |

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|---|-----------------------|
| ENGLISH - B | Full Marks 100 |
| CLASS XI | (20 Marks) |
| Prose | (20 Marks) |
| Packing: Jerome K. Jerome, Our Culture, Their Culture: Rabindranath Tagore, The Struggle Against Dearth: Mankuntala Sen, The School I would Like: School Children (Observer) | |
| Poetry | (20 Marks) |
| The Solitary Reaper: W. Wordsworth, Uphill: C. G. Rossetti, The Owl: Edward Thomas, The Hero: Siegfried Sassoon | |
| Rapid Reader | (25 Marks) |
| The Story of my Life: Helen Keller | |
| Textual Grammar | (15 Marks) |
| Paragraph Writing | (10 Marks) |
| ESP | (10 Marks) |
| Notice, Newspaper Advt. Dialogue | |

| | |
|---|-----------------------|
| CLASS XII | Full Marks 100 |
| Prose | (15 Marks) |
| Extracts from Life at Mokameh Ghat: J. Im Corbett, Rajam and Mani: R. K. Narayanan, Further Progress in Specialisation: S. Leacock, Rejoicements of Environmental Plunder: Jean Dreze, Amartya Sen | |
| Poetry | (15 Marks) |
| The Moon: P. B. Shelley, Where the Mind is without Fear: Rabindranath Tagore, Nature: H. W. Longfellow, Futility: W. Owen | |
| Play | (15 Marks) |
| The Bishop's Candlesticks: N. Mckinnel | |
| Textual Grammar | (10 Marks) |
| Letter Writing | (10 Marks) |
| ESP | (10 Marks) |
| Report Writing, Summary Writing | |
| Comprehension | (20 Marks) |

| | |
|--|-------------------------|
| PHYSICS | Full marks - 100 |
| CLASS - XI | Full Marks - 80 |
| Theory | (32 Marks) |
| Mechanics and Properties of Matter I | (4 Marks) |
| i. Physical world and measurement | (3 Marks) |
| Physics, Technology, Industry and Society, Units of measurement, systems of units, SI units, fundamental and derived units, Dimensions, checking of consistency of equation from the concept of dimensions | |
| ii. Particle Dynamics | (10 Marks) |
| Rest and Motion - Reference frame, displacement, velocity and acceleration: Momentum Kinematical equations (in one dimension), Velocity-time, position-time graphs, elementary problems. | |
| Scalars and vectors: vectors in three dimensions, composition and resolution of vectors, rectangular components in 2 and 3 dimensions, unit vector representation of vector by coordinates, addition and subtraction of vectors by geometrical and analytical methods, commutative and associative properties of vector addition, multiplication of vectors, scalar and vector products (two vectors only), relative velocity and acceleration. | |
| Projectile motion (inclined plane to be excluded). | |
| Newton's laws of motion; inertial force, units of force; impulse and impulsive force; Conservation of linear momentum, elastic collision of particles moving in the same line, jets and rockets; Friction; static and kinetic friction, coeff. of friction. | |
| iii. Statics | (3 Marks) |
| Centre of mass, centre of gravity, momentum conservation and centre of mass motion, conditions of equilibrium of a system of forces. Moment of a force about a point and an axis, couple, torque. | |
| iv. Work, Energy and Power | (Marks 3) |
| Definition of work as a scalar product, relevant units, work done by and against | |

a force mechanical energy: kinetic and potential. Conservation of energy—the case of a freely falling body. Conservative forces; conservation of mechanical energy (kinetic and potential energies), Potential, Non-conservative forces.

Mass-energy equivalence (qualitative idea only).
Power: definition, units.
v. Elastic properties of matter (3 Marks)
Definitions, statements and explanation of the terms: stress, strain, elastic limit, Hooke's law, moduli of elasticity; Young's modulus, Bulk modulus, rigidity modulus, Poisson's ratio, principle of measurement of Y (no experimental details)

vii. Hydrostatics & Fluid Mechanics (9 Marks)
Density and specific gravity (methods of determination not required). Condition of floatation from Archimedes' principle. Pressure of fluids, pressure in a liquid, unit of pressure. Transmission of fluid pressure. Pascal's law, principle of multiplication of force. Hydraulic Press (principle only and problem, no descriptive details) Air pressure and its measurement, Torricelli's and Fortin's barometer, siphon.
Surface energy and surface tension, Capillarity, Laminar and Turbulent flow, Coefficient of viscosity, Bernoulli's Principle (no derivation) and its simple applications, Stokes' law and terminal velocity.

Heat and Thermodynamics (12 Marks)
i. Temperature (1 Marks)
Thermal equilibrium and temperature (Zeroth law of Thermodynamics)

ii. Thermal expansion (4 Marks)
Thermal expansion of solids and liquids; simple demonstrations; coefficients of linear, superficial and cubical expansion of solids, their relations. Application of expansion of solids, (compensated pendulum and bimetallic strip only) real and apparent expansions of liquids. Relation between expansion coefficients, anomalous expansion of water, effect on marine life. Expansion of gas - volume and pressure coefficient.

iii. Calorimetry and change of state (3 Marks)
Preliminary definitions; Principle of Calorimetry (no questions on measurements to be set) Latent heat, brief discussion of determination, calorimetric problems. Effect of pressure on melting point and boiling point, Vapour pressure, Relative humidity. Difference between gas and vapour - critical temperature.

iv. Transmission of heat (4 Marks)
Conduction of heat, thermal conductivity, thermometric conductivity, convection of heat, radiation, radiation as a form of energy. Black body, Kirchhoff's law (statement only), Newton's Law of cooling, Greenhouse effect and global warming.

Vibrations (6 Marks)
Periodic motion: Oscillation and its characteristic, periodic time, frequency, amplitude, Simple Harmonic Motion, Relation between SHM and uniform circular motion, Differential equation of SHM and its solution, Displacement, velocity and acceleration in SHM, Energy in SHM, Time period, frequency, amplitude and phase. Graphical representation of SHM. Simple pendulum, time period of simple pendulum, Superposition of two SHMs of same frequency in the same direction (a) in phase and (b) in opposite phase. Graphical and analytical treatment: Free vibration - Damped vibration (qualitative discussion with example), Forced vibration; resonance.

Geometrical Optics (Marks - 20)
i. Reflection at curved surface (2 Marks)
Definitions of centre of curvature, pole, principal axis, principal focus, aperture, focal length of a spherical mirror. Mathematical relations between u , v and f : Formula for magnification.

ii. Refraction of light (3 Marks)
Laws of refraction (statement, explanations with ray diagrams); definition of refractive index (relative and absolute); cases of refraction from denser to rarer and from rarer to denser media, real and apparent depth.
Total internal reflection, critical angle, relationship between refractive index and critical angle, Transmission of light through optical fibre-brief principle only.

iii. Prism (4 Marks)
Prism refracting surfaces, refracting angle, principal section, refraction through a prism, ray diagram showing deviation by a prism, $D = i_1 + i_2 - A$, idea of minimum deviation (D_m), Experimental and graphical only.

$$\sin(A-D_m)/2 = \mu \sin(A/2)$$
 assuming that for minimum deviation, $i_1 = i_2$

This prism, simple prisms. Total reflecting prisms and its application in periscope. Dispersion - as a phenomenon of breaking up of a composite light into different wavelengths.

iv. Thin lenses (4 Marks)
Thin lenses - Their construction. Basic definition - principal axis, principal foci, ray diagrams showing image formation; Deduction of the lens formula for both convex and concave lenses. (ray sign convention may be used, consistently)

Different cases of image formation for both types of lenses. Power of lenses, definition only, correct location of images for extended objects at different positions by ray tracing method. Lens maker's formula (statement only) - simple problems. Two thin lenses in contact.

v. Optical instruments and human eye (3 Marks)
Photographic Camera (elementary ideas), simple and compound microscope. Astronomical telescope, binocular. (Simple construction as a combination of co-axial lenses and ray diagrams showing final image formation - no discussion on aberrations, resolving power etc. (Deduction of formula for magnification not needed) i. Human eye (defects and remedies only).

Current Electricity (6 Marks)
i. Secondary Cell (2 Marks)
Distinction between primary and secondary cells. Lead acid accumulator: construction, its emf when fully charged, Ampere-hour.

ii. Ohm's Law and resistance (6 Marks)
Flow of electric charges in a metallic conductor, drift velocity and mobility and their relation with electric current. Ohm's Law; volt, ampere and ohm; resistance, resistivity, factors on which resistance of a conductor depends, combination of resistance in series and parallel, equivalent resistance; shunt, internal resistance of cells, Kirchhoff's laws - illustration by simple applications. Wheatstone Bridge, relation between resistances of branches when the bridge is balanced. Its application to P.O. Box and metre bridge for the determination of unknown resistance. Potentiometer - principle and applications to measure potential difference and for comparing emf of two cells.

Modern Physics - I (6 Marks)
Atomic and Nuclear Physics (6 Marks)
Fundamental constituents of atoms and their properties, importance of number of protons in atom, principal constituents of nucleus, atomic number, isotopes, mass number. Radio activity: its discovery, alpha, beta and gamma rays and their principal properties. Radioactive decay law, graphical representation only without deduction, half-life and decay-constant. Radio isotopes, artificial transmutation of elements with simple illustration, Nuclear fission and fusion; chain reaction, nuclear reactor principle of operation. Thermo nuclear fusion as the source of energy in sun and stars.

ii. Thermionic emission (6 Marks)
Fundamental constituents of atoms and their properties, importance of number of protons in atom, principal constituents of nucleus, atomic number, isotopes, mass number. Radio activity: its discovery, alpha, beta and gamma rays and their principal properties. Radioactive decay law, graphical representation only without deduction, half-life and decay-constant. Radio isotopes, artificial transmutation of elements with simple illustration, Nuclear fission and fusion; chain reaction, nuclear reactor principle of operation. Thermo nuclear fusion as the source of energy in sun and stars.

iii. Photoelectric effect (6 Marks)
Fundamental constituents of atoms and their properties, importance of number of protons in atom, principal constituents of nucleus, atomic number, isotopes, mass number. Radio activity: its discovery, alpha, beta and gamma rays and their principal properties. Radioactive decay law, graphical representation only without deduction, half-life and decay-constant. Radio isotopes, artificial transmutation of elements with simple illustration, Nuclear fission and fusion; chain reaction, nuclear reactor principle of operation. Thermo nuclear fusion as the source of energy in sun and stars.

iv. Compton effect (6 Marks)
Fundamental constituents of atoms and their properties, importance of number of protons in atom, principal constituents of nucleus, atomic number, isotopes, mass number. Radio activity: its discovery, alpha, beta and gamma rays and their principal properties. Radioactive decay law, graphical representation only without deduction, half-life and decay-constant. Radio isotopes, artificial transmutation of elements with simple illustration, Nuclear fission and fusion; chain reaction, nuclear reactor principle of operation. Thermo nuclear fusion as the source of energy in sun and stars.

v. Pair production and annihilation (6 Marks)
Fundamental constituents of atoms and their properties, importance of number of protons in atom, principal constituents of nucleus, atomic number, isotopes, mass number. Radio activity: its discovery, alpha, beta and gamma rays and their principal properties. Radioactive decay law, graphical representation only without deduction, half-life and decay-constant. Radio isotopes, artificial transmutation of elements with simple illustration, Nuclear fission and fusion; chain reaction, nuclear reactor principle of operation. Thermo nuclear fusion as the source of energy in sun and stars.

vi. Bohr's model of atom (6 Marks)
Fundamental constituents of atoms and their properties, importance of number of protons in atom, principal constituents of nucleus, atomic number, isotopes, mass number. Radio activity: its discovery, alpha, beta and gamma rays and their principal properties. Radioactive decay law, graphical representation only without deduction, half-life and decay-constant. Radio isotopes, artificial transmutation of elements with simple illustration, Nuclear fission and fusion; chain reaction, nuclear reactor principle of operation. Thermo nuclear fusion as the source of energy in sun and stars.

vii. De Broglie's hypothesis (6 Marks)
Fundamental constituents of atoms and their properties, importance of number of protons in atom, principal constituents of nucleus, atomic number, isotopes, mass number. Radio activity: its discovery, alpha, beta and gamma rays and their principal properties. Radioactive decay law, graphical representation only without deduction, half-life and decay-constant. Radio isotopes, artificial transmutation of elements with simple illustration, Nuclear fission and fusion; chain reaction, nuclear reactor principle of operation. Thermo nuclear fusion as the source of energy in sun and stars.

viii. Heisenberg's uncertainty principle (6 Marks)
Fundamental constituents of atoms and their properties, importance of number of protons in atom, principal constituents of nucleus, atomic number, isotopes, mass number. Radio activity: its discovery, alpha, beta and gamma rays and their principal properties. Radioactive decay law, graphical representation only without deduction, half-life and decay-constant. Radio isotopes, artificial transmutation of elements with simple illustration, Nuclear fission and fusion; chain reaction, nuclear reactor principle of operation. Thermo nuclear fusion as the source of energy in sun and stars.

ix. Matter waves (6 Marks)
Fundamental constituents of atoms and their properties, importance of number of protons in atom, principal constituents of nucleus, atomic number, isotopes, mass number. Radio activity: its discovery, alpha, beta and gamma rays and their principal properties. Radioactive decay law, graphical representation only without deduction, half-life and decay-constant. Radio isotopes, artificial transmutation of elements with simple illustration, Nuclear fission and fusion; chain reaction, nuclear reactor principle of operation. Thermo nuclear fusion as the source of energy in sun and stars.

x. Quantum numbers (6 Marks)
Fundamental constituents of atoms and their properties, importance of number of protons in atom, principal constituents of nucleus, atomic number, isotopes, mass number. Radio activity: its discovery, alpha, beta and gamma rays and their principal properties. Radioactive decay law, graphical representation only without deduction, half-life and decay-constant. Radio isotopes, artificial transmutation of elements with simple illustration, Nuclear fission and fusion; chain reaction, nuclear reactor principle of operation. Thermo nuclear fusion as the source of energy in sun and stars.

xi. Atomic spectra (6 Marks)
Fundamental constituents of atoms and their properties, importance of number of protons in atom, principal constituents of nucleus, atomic number, isotopes, mass number. Radio activity: its discovery, alpha, beta and gamma rays and their principal properties. Radioactive decay law, graphical representation only without deduction, half-life and decay-constant. Radio isotopes, artificial transmutation of elements with simple illustration, Nuclear fission and fusion; chain reaction, nuclear reactor principle of operation. Thermo nuclear fusion as the source of energy in sun and stars.

xii. Franck-Hertz experiment (6 Marks)
Fundamental constituents of atoms and their properties, importance of number of protons in atom, principal constituents of nucleus, atomic number, isotopes, mass number. Radio activity: its discovery, alpha, beta and gamma rays and their principal properties. Radioactive decay law, graphical representation only without deduction, half-life and decay-constant. Radio isotopes, artificial transmutation of elements with simple illustration, Nuclear fission and fusion; chain reaction, nuclear reactor principle of operation. Thermo nuclear fusion as the source of energy in sun and stars.

xiii. Photoelectric effect (6 Marks)
Fundamental constituents of atoms and their properties, importance of number of protons in atom, principal constituents of nucleus, atomic number, isotopes, mass number. Radio activity: its discovery, alpha, beta and gamma rays and their principal properties. Radioactive decay law, graphical representation only without deduction, half-life and decay-constant. Radio isotopes, artificial transmutation of elements with simple illustration, Nuclear fission and fusion; chain reaction, nuclear reactor principle of operation. Thermo nuclear fusion as the source of energy in sun and stars.

xiv. Compton effect (6 Marks)
Fundamental constituents of atoms and their properties, importance of number of protons in atom, principal constituents of nucleus, atomic number, isotopes, mass number. Radio activity: its discovery, alpha, beta and gamma rays and their principal properties. Radioactive decay law, graphical representation only without deduction, half-life and decay-constant. Radio isotopes, artificial transmutation of elements with simple illustration, Nuclear fission and fusion; chain reaction, nuclear reactor principle of operation. Thermo nuclear fusion as the source of energy in sun and stars.

xv. Pair production and annihilation (6 Marks)
Fundamental constituents of atoms and their properties, importance of number of protons in atom, principal constituents of nucleus, atomic number, isotopes, mass number. Radio activity: its discovery, alpha, beta and gamma rays and their principal properties. Radioactive decay law, graphical representation only without deduction, half-life and decay-constant. Radio isotopes, artificial transmutation of elements with simple illustration, Nuclear fission and fusion; chain reaction, nuclear reactor principle of operation. Thermo nuclear fusion as the source of energy in sun and stars.

SYLLABUS

gases (brief discussion), reversible and irreversible processes. Specific heats of gases relation between C_p and C_v .

ii. Kinetic theory of gases (5 Marks)
Evidence of molecular structure of matter and of random molecular motion. Brownian motion (qualitative discussion). Basic assumptions of kinetic theory of ideal gases. Mean, rms and most probable speed. Pressure of an ideal gas (simple derivation). Charles's law, Boyle's law, Avogadro's law and pressure law from kinetic theory of gases. Kinetic energy of molecules and absolute temperature, definition of mean free path.

Waves and Physical Optics (16 Marks)
i. Waves (11 Marks)
Elastic waves - longitudinal and transverse, characteristics of propagating waves, nature of the medium, wave-length, amplitude of wave, time period, frequency, velocity of wave and their relation. Properties of waves: Laws of reflection and refraction of waves with reference to sound wave.

Sound wave: Longitudinal elastic wave, velocity of sound wave, statement and explanation of Newton's formula and Laplace's correction. Dependence of velocity on temperature, pressure and humidity of air.

Superposition of waves - graphical and analytical representation: (i) two S.H. waves of nearly equal frequency and amplitude and moving in the same direction (beat); determination of unknown frequency from beating frequency; (ii) Two S.H. waves of equal amplitude and frequency travelling in opposite directions (standing or stationary waves); characteristics of standing waves and comparison with progressive wave.

Transverse standing waves on stretched wire, laws of transverse vibration of strings, fundamental, harmonics.

Longitudinal standing waves in air column. (i) Vibration of air column in a tube closed at one end. Determination of velocity of sound or the frequency of a tuning fork by resonance with vibration of air column in a tube closed at one end. (ii) Vibration of an air column in a tube open at both ends.

Doppler Effect in sound propagation (Derivation not required)

ii. Physical Optics (5 Marks)
Wave front and Huygen's Principle; Reflection and refraction of plane wave at a plane surface using wave fronts (qualitative idea); Interference - Young's double slit experiment and expression for fringe width. Coherent sources.

Electrostatics (12 Marks)
i. Introduction (3 Marks)
Electric field from friction, two types of electricity, specific gravity is a surer test of electrification explanation of charging by rubbing in the light of electron theory. Conductor and insulator. Dielectric polarization - physical explanation.

Charge resides on the outer surface of a conductor - Electric screening. Effect of curvature on surface density of charge, action of points - discharging action of points, spraying action of points, collecting action of points, lightning conductor.

ii. Electrostatic field and electric potential (6 Marks)
Coulomb's law of force between two point charges; permittivity, e.s.u. and S.I. unit of charge, electric intensity. Electric field due to a point charge. Electric lines of force, properties of lines of force. Electric dipole, electric field due to a dipole and behaviour of a dipole in a uniform electric field.

Electric flux, statement of Gauss' Theorem and its application to find field due to uniformly charged infinitely long straight wire, infinite plane sheet and thin spherical shell. Potential, Practical unit of potential, potential of a charged conductor, potential of the earth, relation between intensity and potential (qualitative).

iii. Capacitance and capacitors (20 Marks)
Capacitance of a conductor, factors affecting capacitance of conductor, capacitance of a spherical conductors, parallel plate capacitors and capacitance. Unit of capacitance. Combination of capacitors in series and parallel. Types of capacitors. Van de Graff Generator.

Current Electricity - II (20 Marks)
i. Heating effect of current (4 Marks)
Joule's law, mechanical equivalent of heat and its determination by electrical method. Electrical energy, power, unit of power and energy (to be taught in S.I. units). Board of Trade unit of electrical energy. Thermoelectricity, Seebeck and Peltier effect, thermos-emf, thermo current, thermocouple. Thermo-emf depends on difference of temperature of the two junctions of a thermocouple and nature of the metals of the thermocouple.

ii. Electromagnetism I (8 Marks)
Concept of magnetic field. Oersted's experiment, Biot Savart law, Magnetic field due to an infinitely long current carrying straight wire and a circular loop, Ampere's circuital law and its application to straight and toroidal solenoids; Force on a moving charge in uniform magnetic and electric fields. Cyclotron frequency, force on current carrying conductor in a uniform magnetic field. Forces between two parallel current-carrying conductors-definition of ampere. Torque experienced by a current loop in a uniform 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; magnetic field intensity due to

an infinitely long current carrying straight wire and a circular loop, Ampere's circuital law and its application to straight and toroidal solenoids; Force on a moving charge in uniform magnetic and electric fields. Cyclotron frequency, force on current carrying conductor in a uniform magnetic field. Forces between two parallel current-carrying conductors-definition of ampere. Torque experienced by a current loop in a uniform 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; magnetic field intensity due to

an infinitely long current carrying straight wire and a circular loop, Ampere's circuital law and its application to straight and toroidal solenoids; Force on a moving charge in uniform magnetic and electric fields. Cyclotron frequency, force on current carrying conductor in a uniform magnetic field. Forces between two parallel current-carrying conductors-definition of ampere. Torque experienced by a current loop in a uniform 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; magnetic field intensity due to

to a magnetic dipole (bar magnet). Tangent galvanometer: Bar magnet as an equivalent solenoid, magnetic field lines. Molecular theory of magnetism. Magnetic permeability and susceptibility. Dia-, para- and ferromagnetic substances, examples. Terrestrial magnetism; Magnetic elements, Definitions, Declination, Dip and Horizontal component of the earth's magnetic field; their explanation (measurements not required).

iii. Electromagnetism-II (4 Marks)
Electromagnetic induction. Magnetic induction, magnetic flux, flux density. Faraday's laws of induction, induced emf, induced current; Lenz's law of Electro-magnetic induction and its justification from the principle of conservation of energy. Determination of the direction of induced current by Lenz's law, emf induced in a conductor moving in a magnetic field, Fleming's left-hand rule.

iv. Alternating current (4 Marks)
Idea of alternating current (qualitative discussion only); peak and rms values of alternating current/voltage. Elementary principles of dynamo and DC Motor.

Modern Physics-II (12 Marks)
i. Electromagnetic waves (2 Marks)
Electromagnetic waves and their characteristics (qualitative ideas only); transverse nature of electromagnetic waves. Polarization of electromagnetic wave, Plane, Polarized light. Electromagnetic spectrum (Radio, microwaves, infra-red, optical, ultraviolet, X-rays, Y-rays.)

ii. Semi conductors and Electronics (5 Marks)
Elementary idea of energy bands in solids; intrinsic, p and n-type semiconductors, p-n junction diode and its characteristics, its use as half-wave and full-wave rectifiers, pnp and npn transistors, their CE characteristics. Binary numbers - basic concepts AND, OR, NOT gates.

iii. Quantum theory (5 Marks)
Photoelectric phenomena, particle nature of radiation; Einstein's equation; threshold frequency; work function; energy and momentum of photon, photoelectric cell. Wave particle duality, de Broglie's hypothesis (qualitative idea only). Deduction of Bohr's formula and explanation of emission and absorption of radiation through electronic transition. X-ray emission, Moseley's law and atomic number.

PRACTICAL Full marks - 20

- Theory, Model, Accuracy (12 Marks)**
- To determine the sp. gr. of a body lighter than water by using hydrostatic balance.
 - To determine the sp. gr. of a granular solid insoluble in water with the help of a sp. gr. bottle.
 - To draw L-T curve by determining time periods with the help of a simple pendulum for at least five different lengths of oscillations and to verify the proportionality of L and T^2 .
 - To verify Boyle's law for a gaseous material using five different pressures - atmospheric pressure, 2 pressures below and 2 pressures above the atmospheric pressure - by showing PV as constant.
 - To determine unknown frequency of a tuning fork by using a sonometer (mass per unit length of the sonometer to be supplied)
 - To determine the focal length of a given convex lens by u-v method using pins or screen & a luminous object (at least five diff. object distances should be used).
 - To trace magnetic lines of force due to a bar magnet when its North Pole is pointing north.
 - To verify the laws of combination of two resistances (a) in series and (b) in parallel by using a P.O. Box.
 - To determine the value of an unknown resistance with the help of a meter bridge (Neglect End-correction)
 - To determine the value of the reduction factor of a single coil tangent galvanometer by using three known current (measured by an ammeter) and hence to determine the value of an unknown current corresponding to a given deflection of the galvanometer.
 - To determine the velocity of sound in air by resonance of air column by elimination of end correction (neglect correction due to moisture and temp).
N.B. At least 8 experiments to be performed by each student.

Laboratory Note Book
Viva Voce

CHEMISTRY CLASS - XI

Full marks - 100
Full Marks - 80

THEORY

Unit-1: Atoms, Molecules & Chemical Arithmetic (8 Marks)

Dalton's atomic theory (critical study). Avogadro's Law, Application of Avogadro's Law and deduction of M₂D and molar volumes of ideal gases at STP. Avogadro's Number. Atomic mass; molecular mass, equivalent weight (no experimental determination required); Valency, A-EV, Gram atomic, gram molecular and gram equivalent weight; Gay Lussac's Law of gaseous volume. Mole concept. Weight - weight, weight - volume calculations, Eudiometry.

Percentage composition, empirical formula and molecular formula, simple Numerical problems.

Unit-2: Atomic Structure (8 Marks)

Concept of Nuclear Atom: electron, proton and neutron (charge and mass of), atomic number (Z), Extra-nuclear structure, Rutherford's model and its limitations. Line spectra of hydrogen atom, quantization of energy (Planck's equation $E = h\nu$), Bohr's model of hydrogen atom and its limitations, Sommerfeld's modifications (elementary idea). The four quantum numbers: n, l, m and s, the s, p, d and f electrons, ground state electronic configurations of many electron atoms and mono atomic ions; the Aufbau Principle, Pauli's Exclusion Principle and Hund's Rule. The concept of atomic orbital, shapes of s, p and orbitals (qualitative approach).

Unit-3: Colloidal Solutions, Electrolytic Solution & Chemical Equilibrium (10 Marks)

Colloidal Solutions: Differences from true solutions, hydrophobic and hydrophilic colloids (meaning, examples and uses), coagulation and peptization of colloids; dialysis and its applications, Brownian motion, Tyndall effect and its applications.

Electrolytic Solutions: Specific conductance, equivalent conductance and ionic conductance (definitions only), Kohlrausch's law (statement only), Faraday's laws of electrolysis and their applications, the Faraday (F), unit of charge-the electron (e=F/N), Numerical problems.

Chemical Equilibria: The Law of mass action, dynamic nature of chemical Equilibria equilibrium constants (K), Le Chatelier's Principle, Equilibrium constants of gaseous reactions (K_p and K_c) and relation between them (examples).

Unit-4: Gas Laws (6 Marks)

Gaseous state. Measurable properties of gases. Boyle's Law & Charles Law, absolute scale of temperature, kinetic theory of gases (postulates only), ideal gas equation: $PV = nRT$, $PV = \frac{w}{M}RT$, Dalton's Law of partial pressure, Graham's Law of diffusion. Deviations from ideal behavior. Liquefaction of gases, real gases, Van der Waal's equation. (Numerical problems).

Unit-5: The Periodic Table & The Chemical Families: (8 Marks)

Modern periodic law (based on atomic number), Modern periodic tables based on electronic configurations, groups and periods. Types of elements representative (s-block and p-block) elements, transitional (d-block) elements and inner transitional (f-block) elements (lanthanides and actinides) and their general characteristics. Periodic trends in physical and chemical properties: atomic radii, Valency, ease of ionization (elementary idea about ionization energy and electron affinity), electronegative metallic nature, acidic and basic natures of oxides and hydrides of the representative elements (up to Z = 20). Position of hydrogen and the noble gases in the periodic table, diagonal relationships.

Unit-6: Chemical Bonding & Molecular Structure (10 Marks)

Valency electrons, the octet rule. Electrovalent and covalent bonds with examples. Properties of electrovalent and covalent compounds. Limitation of octet rule (examples). Directionality of covalent bonds, shapes of poly atomic molecules (examples), concept of hybridization of atomic orbitals (qualitative pictorial approach); sp, sp² and sp³ hybridizations with typical examples. Tetrahedral space model of carbon atom, single bond, double bond and triple bond involving carbon atom with examples, s and p bonds. Valence Shell Electron Pair Repulsion (VSEPR) concept (elementary idea)-shapes of H₂O, H₂S, CH₄, CO₂, NO₂ and SO₂ molecules. Concept of resonance (elementary idea), resonance structures (examples). Elementary idea about electronegativity, bond polarity and dipole moment. Hydrogen bonding and its effects on physical properties (MP, BP and solubility). Double salts and complex salts and coordination compounds (examples only), coordination number (examples with CN 4 and 6 only).

Unit-7: Chemistry of Non-Metallic Elements & Their Compounds (10 Marks)

Carbon: Occurrence, isotopes, CO & CO₂ - production, properties and uses.
Nitrogen & Phosphorus: Occurrence, Isotopes, isolation from natural sources and purification, reactivity of the free elements. Preparation, properties, reactions of NH₃ and PH₃, N₂O, NO and NO₂, and HNO₂, P₂O₅ and P₂O₃, H₃PO₄ and H₃PO₃.

Oxygen and Sulphur: Occurrence, isotopes, allotropic forms, isolation from natural sources and purification, properties and reactions of the free elements. Water, unusual properties of water, heavy water (production and uses). Hydrogen Peroxide and Ozone (production, purification, properties, reactions and uses). H₂S, SO₂ and H₂SO₄ (preparation properties reactions and uses).

Unit-8: Chemistry of Organic Compounds (II) (8 Marks)

Aliphatic Compounds: Hydrocarbons Compounds: Unique nature of the carbon atom - catenation. Classification of organic compounds, homologous series of compounds up to C₁₀ (open chain) and their IUPAC and trivial names, structural isomerism. Detection of special elements (N, Cl, Br, I and S) in organic compounds by chemical tests. Elementary principles of estimation of C, H and N in organic compounds. Determination of molecular masses of organic compounds (principles of silver salt method, chromyl chloride method, Victor Meyer's method and elementary idea about mass spectrometry). Problems on empirical formulae and molecular formulae.

Hydrocarbons: Petroleum as the industrial source of hydrocarbons. Alkenes: methane and ethane. Alkane: ethylene, propane, Alkyne: acetylene - (preparation, large scale production, properties and reactions (including the application of Markovnikov's rule where applicable and technical uses).

Unit-9: Chemistry in Industry (Marks 10)

Large scale production involving physico-chemical principles where applicable omitting technical details and uses of individual items

- Heavy chemicals: Sulfuric acid (contact process), ammonia (Haber's process), nitric acid (Ostwald's process), sodium bicarbonate and sodium carbonate (solvey process).
- Polymers: Polythene, Nylon 66, rubber from natural sources including vulcanisation.
- Electrochemicals: Sodium hydroxide, hydrogen, chlorine, bleaching powder.
- Fuel Gases: Coal gas, producer gas, water gas, LPG.
- Fertilizer: Urea, ammonium sulfate, super phosphate of lime.
- Ceramics: Portland cement and glass.

Unit-10: Environmental Chemistry (4 Marks)

Chemical nature of air, water & soil and their role in environment. Common modes of pollution of air, water and soil. Importance of Ozone layer. Important chemical interactions, reactions. Green house effect, Smog. Pollution of water by domestic and industrial effluents. Pollution & degradation of soil - Pesticides & fertilizers.

Practical Full Marks - 20

Unit-11: Basic Laboratory Techniques & Investigatory Projects (10 Marks)

1. Basic Laboratory Techniques (All Compulsory) (3 Marks)

- Acquaintance with Bunsen burner / spirit lamp / LPG burner etc.
- Bending of glass tube, glass rod, making jet etc.
- Boring cork and fitting up of wash bottle.
- Acquaintance with chemical balance and weight box (setting up of balance, labelling and weighing).
- Filtration and crystallization

2. Investigatory Projects (At least three to be performed) (3 Marks)

- Crystallization of sucrose / copper sulphate.
- Study of rusting of iron. To study the increase of weight due to rusting of known weight of iron in moist air.
- Study of hydration of anhydrous salts (Na₂CO₃ / Na₂SO₄): To study the increase in weight due to hydration in moist air.
- Study of sublimation of camphor: To study the loss in weight due to sublimation in air.
- Study of heat of reaction: To study the rise or fall of temperature due to:
 - Dilution of conc. H₂SO₄ with water (addition of different volumes conc. H₂SO₄ to fixed volume of water).
 - Neutralization of strong acid (HCl) with strong base (NaOH)
 - Dissolution of KNO₃, NaNO₃, NH₄Cl in water.
- Preparation of hydrophilic sol (starch / egg / albumin) and hydrophobic sol (hydrated aluminium oxide / hydrated ferric oxide) their dialysis and comparison of precipitation values of NaCl, NH₄Cl, SO₂, BaCl₂.
- Study of dialysis of different samples of waste water and identification of different ions in the resulting solution by chemical tests (may be done during class-XII)
- Construction of voltic cell (Daniell cell and measurement of e.m.f. using voltmeter of high internal resistance).
- Study of variation of e. m. f. of Zn / Zn²⁺ / Cu²⁺ / Cu cell with change of concentration of electrolyte (ZnSO₄ / CuSO₄) at room temperature.
- Determination of pH of dilute solutions of acids and bases, buffer solutions and fruit juices using universal indicator paper / solution.
- Determination of doses of bleaching powder required to disinfect samples of water from different sources.
- Study of setting of mixtures of cement with lime, sand of different qualities (rice husk etc. with respect to time, volume and strength).

Unit-12: Qualitative Chemical Analysis (10 Marks)

- Detection of Acid and Basic Radicals by dry and wet tests (one acid radical and one basic radical from same or different samples soluble in water) from among: (4 Marks)
- Acid Radicals: Cl⁻, S²⁻, SO₃²⁻, NO₂⁻, CO₃²⁻
- Basic Radicals: Cu²⁺, Al³⁺, Fe³⁺, Fe²⁺, Zn²⁺, Ca²⁺, Mg²⁺, Na⁺, NH₄⁺
- Detection of Functional Groups (one functional group) in solid compounds from among -NH₂ (aromatic) by characteristic tests (carbylamine test not to be performed), -OH (phenolic), -CHO (>C=O & -COOH) (2 Marks)
- Viva-Voice (to be internally evaluated by continuous assessment) (2 Marks)
- Laboratory Records (to be internally evaluated by continuous assessment) (2 Marks)

CHEMISTRY CLASS - XII

Full marks - 100
Full Marks - 80

THEORY

Unit-1: Radioactivity (5 Marks)

i) Natural Radioactivity: Alfa beta and gamma-rays and their properties. Rate of radioactive decay, decay constant and half-life period of radio elements. Numerical problems.

ii) Stability of the atomic nucleus: Effect of neutron proton (n/p) ratio on the

modes of decay, group displacement law, radioisotopes and their uses (¹⁴C, ³²P, ⁶⁰Co and ¹³⁷I as examples) isotopes and isotones (definition and examples only), elementary idea about nuclear fission and fusion reactions.

Unit-2: Chemical Energetics & Chemical Dynamics (14 Marks)

i) Chemical Energetics: Energy changes in physical and chemical transformations. Internal energy change (ΔE) and Enthalpy Change (ΔH) in a chemical reaction. Hess's Law and its applications. Numerical problems.

The Law of conservation of energy, the first law of thermodynamics. (Spontaneity of a chemical reaction). The second law of thermodynamics. (no numerical problems). Elementary idea about Entropy change (ΔS) and Free Energy Change (ΔG) significance of the relation: $\Delta G = \Delta H - T\Delta S$ (without derivation) example with gaseous reactions. Numerical problems.

ii) Chemical Dynamics: Dependence of reaction rates with concentration, pressure, temperature, catalyst, size of particles etc.; concept of energy barrier and activation energy (qualitative non-mathematical approach).

Order and molecularity of reactions (determination excluded). First order reactions specific rate constant, half-life period, numerical problems, and examples of first order and second order reactions.

Unit-3: Chemistry of Solutions (5 Marks)

Non-Electrolytes
Non-Electrolytic Solutions: Types of solution, vapour pressure of solutions of solids in liquids and Raoult's Law of relative lowering of vapour pressure, colligative properties: osmotic pressure, Depression of freezing points and elevation of boiling points of solutions & their relationships with molecular masses of solutes and solvents (without derivations). Numerical problems.

Unit-4: Acid-Base, Solubility & Redox Equilibria (8 Marks)

Acid-Base, Solubility Equilibria: Ionization of weak electrolytes, Ostwald's dilution law, ionization constants of weak acids and bases, ionic product of water, the pH-scale, pH of aqueous solutions of acids and bases, elementary idea about buffer solutions and buffer action (examples only). Stoichiometry of acid-base reactions, acid-base titrations, acid-base indicators (structures non-evaluated). Solubility and Solubility Products, Common ion effect (examples) (No Numerical problems).

Redox Equilibria: Oxidation-Reduction reactions as electron transfer processes, oxidation numbers, balancing chemical equations of Redox reactions by oxidation number and ion-electron methods. Standard electrode potentials (E⁰). Electrode potential series, feasibility of a Redox reaction, significance of Gibbs's equation: $\Delta G^{\circ} = -nFE^{\circ}$ (without derivation). (No Numerical Problems) Stoichiometry of redox reactions, redox titrations (examples). (Numerical problems).

Unit-5: Chemistry of non metals: Halogen (5 Marks)

Comparative study of the halogen family: Occurrence, physical states and chemical reactivities of the free elements, peculiarities of fluorine and iodine, hydric acid of halogens (preparation, properties, reactions and uses) inter-halogen compounds (examples).

Unit-6: Chemistry of Metals (10 Marks)

General principles of metallurgy: Occurrence and dressing of ores, concentration of ores, production and purification of metals. Mineral wealth of India.

Typical Metals: Occurrence, extraction, purification (where applicable), properties and reactions with air, water, acids, non-metals in respect of following metals: Na, Ca, Al, Fe, Cu and Zn. Manufacture of steels and alloy steel (Bessemer, Open Hearth and L. D. process). Principles of chemistry involved in electroplating, anodizing, galvanizing.

Unit-7: Chemistry of Organic Compounds (I) (7 Marks)

Halohydrocarbons: General methods of preparations, general properties of haloalkanes, halomethane, chloroform & iodoform (preparation, properties and uses). **Organometallic Compounds:** Preparation of Grignard's reagents and their synthetic applications for the preparation of alcohols, aldehydes, ketones, acids and amines.

Aliphatic Compounds with Functional Groups: General methods of preparation, large scale production, properties, reactions of uses of individual compounds included in the syllabus and problems based on stoichiometry, structure, physical and chemical properties, reactions of functional groups:

Alcohols: methanol and ethanol (from fermentation).

Ether: diethyl ether.

Unit-8: Chemistry of Organic Compound (2) (10 Marks)

Aromatic Compounds with Functional Groups: General methods of preparation, large scale production, properties, reactions, uses of individual compounds included in the syllabus and problems based on stoichiometry, structure, physical and chemical properties, reactions of functional groups.

Aldehydes & Ketones: Formaldehyde, acetaldehyde, and acetone.

Carboxylic acids & their derivatives: formic acid, acetic acid, and oxalic acid; acetyl chloride, acetic anhydride and acetoamide.

Ester: ethyl acetate, Nitro compounds, Amines, Cyanides and Isoocyanides.

Unit 9: Chemistry of Organic Compounds (3) (10 Marks)

Benzene and its derivatives. Coal tar distillation and isolation of benzene.



SYLLABUS

Substitution reactions (Chlorination, nitration, sulfonation and Friedel-Craft reaction) on benzene derivatives, directive influence of substituents (examples).
Preparation, properties, reactions and uses of chlorobenzene, nitrobenzene, aniline, phenol, benzaldehyde, benzoic acid, salicylic acid, anthranic acid.
Preparation, reaction, and synthetic applications of benzenediazonium chloride. Toluene and its o, m, p substituted derivatives and their side chain oxidations.
Problems based on stoichiometric physical and chemical properties, structure and reactions of functional groups.

Unit - 10 : Application Oriented Chemistry and introduction to Biomolecules

(6 Marks)

Application Oriented Chemistry : (i) Main ingredients, their chemical nature (structures not required) and their side effects if any of common antiseptics, analgesics, antacids, pain killers, vitamin C. (ii) Technical / Domestic / Medicinal uses of Chemicals : Baking powder, plaster of paris, calcium lactate, common alum, boric acid, borax, copper sulfate, epsom salt, oil of winter green, carbolic acid.

Introduction to Biomolecules : (i) Carbohydrates : Pentoses & Hexoses. Distinctive chemical reactions of glucose. (ii) Amino Acids : Glycine, alanine, aspartic acid, cysteine (Structure), Zwitterion structures of amino acids peptides bond. ADP & ATP : structures and role in bioenergetics, Nucleic acids – DNA & RNA skeleton structures.

PRACTICAL Full Marks - 20

Unit - 11 : Quantitative Chemical Analysis (10 Marks)

1. Titrimetric Estimations :

(a) Acid - Base Titrations (at least two to be performed) :

(i) Preparation of standard (N/10) oxalic acid solution and determination of strength of (N/10) sodium hydroxide solution.

(ii) Determination of strength of (a) (N/10) HCl solution, (b) (N/10) acetic acid solution by titration with standard (N/10) NaOH solution (supplied).

(iii) Preparation of standard (N/10) sodium carbonate solution and determination of strength of (N/10) HCl solution.

(iv) Determination of acid content of lemon juice by titration with standard (N/10) NaOH solution (supplied).

(b) Redox Titrations (at least two to be performed) :

(i) Preparation of standard (N/10) oxalic acid solution and determination of strength of (N/10) $KMnO_4$ solution.

(ii) Determination of strength of Fe^{2+} solution (Mohr's salt) by titration with standard (N/10) $KMnO_4$ solution (supplied).

(iii) Determination of strength of H_2O_2 solution by titration with standard (N/10) $KMnO_4$ solution (supplied).

(iv) Determination of strength of "hypo" solution (sodium thiosulphate, $Na_2S_2O_3 \cdot 5H_2O$) by titration against standard (N/10) iodine solution (supplied) using starch indicator.

***Demonstrations : Preparation of standard (N/10) solutions of oxalic acid / sodium carbonate.**

Unit - 12 : Identification of Pure Compounds (10 Marks)

1. Identification of single solid / liquid pure compound (inorganic / organic) by Chemical tests.

a) **Solids :** $NaCl$, NH_4Cl , $(NH_4)_2SO_4$, Na_2CO_3 , boric acid, borax, urea, glucose, sucrose, common alum.

b) **Liquids :** HCl , HNO_3 , H_2SO_4 , H_2O_2 , formic acid, acetic acid (cacodyl oxide test not to be performed), methanol, ethanol, acetone, glycerol.

2. Viva-Voice (to be internally evaluated by continuous assessment)

3. Laboratory Records (to be internally evaluated by continuous assessment)

MATHEMATICS

CLASS - XI

Full Marks-100

(50 Marks)

1. Algebra

Surds and Indices :

Fundamental laws of indices, simple applications of surds and indices.

Arithmetic Progression : (A.P.) Definition of A. P., Common Difference, General term, Summation of first n terms, Sum of first n natural numbers, A.M.

Geometric progression : (G.P.) :

Definition of G. P., Common ratio, General term, Summation of first n - terms, G. M.

Logarithms :

Definition, General properties of logarithms.

Complex numbers :

Complex numbers in the form $a+ib$, Real and imaginary parts of a complex number, Geometrical representation of complex numbers, Complex Conjugate, Modulus and Argument of a complex number, Algebra of complex numbers, Triangle inequality $|z_1 + z_2| \leq |z_1| + |z_2|$ and also $|z_1 z_2| = |z_1| |z_2|$, Cube roots of unity and their properties.

Theory of Quadratic Equations :

Quadratic equations with real coefficients, Fundamental theorem of Algebra (Statement only), Roots, relations between roots and coefficients of a quadratic equation, Nature of roots, formation of quadratic equation, common root, Sign and magnitude of the quadratic expression ax^2+bx+c (a, b, c are rational numbers).

Permutation and Combination :

Definition of Permutation, Permutation of n different things taken r ($r \leq n$) at a time; Permutation of n things, not all different; Permutation with repetitions (circular permutation excluded).

Definition of combination; combination of n different things taken r at a time; combination of n things when things are not all different; Basic properties.

2. Trigonometry

(25 Marks)

The associated angles: 0° (+ve or -ve), $90^\circ+0$, $180^\circ+0$, $270^\circ+0$, $360^\circ+0$.

The Trigonometric ratios of compound angles :

Sum and difference formula for $\sin(A \pm B)$, $\cos(A \pm B)$ etc.

Sum and difference as products: Sum and difference as products: (A, B, A \pm B are all acute angles)

Multiple and submultiple angles :

Simple problems; Finding the values of sine, cosine and tangent of the angle θ where $\theta = 15^\circ, 16^\circ, 36^\circ, 72^\circ$.

General solutions of Trigonometrical equations :

$\sin \theta = 0$, $\cos \theta = 0$, $\tan \theta = 0$

$\sin^2 \theta = \sin^2 \alpha$, $\cos^2 \theta = \cos^2 \alpha$, $\tan^2 \theta = \tan^2 \alpha$.

Trigonometrical Inverses :

(Specific mention of principal values.)

Properties of triangles :

Basic relations between sides, angles, circum radius. Area of triangles of the form $\frac{1}{2}bc \sin A$. Simple and direct applications.

3. Coordinate Geometry of two dimensions

(14 Marks)

(All discussions should be made in terms of rectangular Cartesian co-ordinate system)

Basic Ideas :

Distance formula, Section formula, Area of a triangle, condition of collinearity of three points in a plane. Polar coordinates: Transformation from Cartesian to polar coordinates and vice-versa. Parallel transformation of Axes. Concept of locus. Elementary locus problems.

Equations of straight lines

Slope of a line. Slope in terms of co-ordinates of two points on it. Equations of co-ordinate axes, equation of lines parallel to coordinate axes, slope-intercept form, gradient / slope form, equation of the line through two given points, intercept form, symmetric form, normal form. Every first degree equation in x and y represents a straight line.

Angle between two lines-conditions of perpendicularity and parallelism of two lines. Equation of a line parallel to given line. Equation of a line perpendicular to given line. Distance of a point from a straight line.

Equations of Circles :

Standard equation $x^2 + y^2 = a^2$. Equation of a circle with a given centre and radius. Equation of the form $x^2 + y^2 + 2gx + 2fy + c = 0$ represents a circle. Equation of a circle in terms of the circle's coordinates of before the end points of a diameter. Parametric equation of a circle.

4. Sets, Relations and Mappings :

(10 Marks)

Idea of Sets, Finite and Infinite sets, Empty set, universal set, subsets, Power set Venn diagram, Complement of a set, operation on sets (Union, intersection, difference of two De-Morgan laws) Inclusion / Exclusion formula for two or three finite sets. Cartesian product of sets.

Idea of relations, mappings, range and domain, injective, surjective and bijective mapping. Composition of mappings, Inverse of a mapping.

5. Differential Calculus :

(15 Marks)

Idea of number system :

Integer, Rational, Irrational and real number.

Variables and functions :

Variables, Functions of Single variable, Geometrical representations of functions of the form:

$$ax + b \text{ (a, b rational, } \sqrt{x} \text{ (x > 0)), } \frac{1}{x} \text{ (x \neq 0)}$$

$$|x|, \frac{|x|}{x} \text{ (x \neq 0), } \sin x, \cos x, \tan x.$$

Idea of rational functions; Idea of exponential and logarithmic functions. Increasing and decreasing functions, odd and even functions.

Limit and Continuity :

Idea of limit of a function with more stress on geometrical and intuitive approach. Algebra of limits (statement only, no proof) (n a positive or negative

integer (a \neq 0) (statement only) proof of

$$\lim_{x \rightarrow a} \frac{(x^n - a^n)}{(x - a)} = na^{n-1}$$

where n is a positive integer. Use of the Limits (without proof)

$\lim_{x \rightarrow 0} \frac{\sin x}{x}$, $\lim_{x \rightarrow 0} \frac{e^x - 1}{x}$, $\lim_{x \rightarrow 0} \frac{\log(1+x)}{x}$, $\lim_{x \rightarrow a} \frac{x^n - a^n}{x - a}$

(n rational number), limit of a function of a function (statement only), Simple applications of the above limits. Geometrical idea of continuity of a function at a point, (Geometric and intuitive approach), simple applications.

Derivative / Differential coefficients of functions :

Derivative of a constant function, x^n (n-rational), $\sin x$, $\cos x$, e^x , $\log x$ from first principle. Working rule of derivative of x^n (n is a real number); Rules of differentiation of sum, product and quotient of two functions (Statement only). Differential coefficients of $\tan x$, $\cot x$, $\sec x$, $\csc x$, $\sin^{-1} x$, $\cos^{-1} x$, $\tan^{-1} x$, $\csc^{-1} x$, $\sec^{-1} x$, $\cot^{-1} x$.

6. Vector :

(6 Marks)

Vectors and scalars. Equal vectors, unit vector, Zero vector, Position Vector of a point in terms of i and j. Localized and free vectors, collinear vectors, 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. Application of vectors in geometry (Simple geometrical problems).

CLASS - XII

Full Marks-100

1. Algebra

(20 Marks)

Probability

Concept of Random experiments and their outcomes sample space, Events, certain and uncertain events. Equally likely outcomes. Classical definition of probability, addition rule, multiplication rule (Venn diagram may be used).

Principle of Mathematical Induction:

Statement of the principle. Proof for the sum of squares, sum of cubes of first n natural numbers, divisibility properties like $2^n - 1$ divisible by 3, $n \geq 1$, 7 divides $3^{2n} + 2^{2n} - 1$.

Binomial theorem for positive integral index :

Statement of the theorem, proof by method of induction, general terms, number of terms, middle term, equidistant terms.

Infinite Series :

Binomial theorem for negative integral and fractional index, exponential, logarithmic series, infinite G.P. series with ranges of validity (only statement), Simple application of the series. (Expansion of the series should be insisted upon.)

Matrices and Determinants:

Concept of $m \times n$ ($m \leq 3$, $n \leq 3$) real matrix, types of matrices. Operations of addition, Scalar multiplication and multiplication of matrices, Inverse of 2×2 matrices.

Determinant of an $n \times n$ ($n \leq 3$) matrix. Statement of the properties of determinant only. Minors and Co-factors. Application of determinant in (i) finding area of a triangle (ii) Solving a system of linear equation (not more than three variables) by Cramer's rule.

2. Co-ordinate Geometry of Two Dimensions

(11 Marks)

Conics:

Definition of conics (Parabola, ellipse, hyperbola) given focus and directrix, eccentricity, Classification of standard conics (parabola, ellipse, hyperbola) in terms of eccentricity.

Parabola:

Standard equation, reduction of the form ax^2+by^2+c or ax^2+by^2+c to the form $y^2=4ax$ or $x^2=4ay$ respectively elementary properties and parametric equation of parabola.

Ellipse and hyperbola:

Standard equations only. Conjugate Hyperbola. Elementary properties. Parametric equations.

3. Differential Calculus

(10 Marks)

Differentiation of a function of a function, Implicit functions (statement only) - their derivations, Differentiation of functions in parametric form.

Logarithmic differentiation, Second order derivation of a function.

4. Integral Calculus

(25 Marks)

Indefinite integral. Integration as the inverse of differentiation. Primitive, integrals of x^n ($n \neq -1$), $\sin mx$, $\cos mx$, $\sec mx$, $\csc mx$, $\tan mx$, $\cot mx$, $(m \neq 0)$ e^{mx} , $1/x$, (Assuming the functions and primitives are defined), Integral of the sum of two functions, Integration by simple substitutions; standard integrals of the form

$$\int \frac{dx}{x^2 + a^2} \int \frac{dx}{\sqrt{x^2 + a^2}} \int \frac{dx}{\sqrt{a^2 - x^2}} \int \frac{dx}{ax^2 + bx + c} \int \frac{(px + q) dx}{ax^2 + bx + c}$$

; direct application.

Integration by parts :

Rule of integration by parts. Application in simple cases.

Standard integrals of the form:

$$\int \sqrt{x^2 \pm a^2} dx, \int \sqrt{a^2 - x^2} dx, \int a^{\sin bx} dx,$$

$$\int e^{ax} \cos bx dx, \int \sqrt{ax^2 + bx + c} dx, \int (px + q) \sqrt{ax^2 + bx + c} dx,$$

$$\int \frac{dx}{a + b \cos x}, \int \frac{dx}{a + b \sin x},$$

Integration of rational algebraic functions by partial fractions of the form

$$\int \frac{dx}{(x-a)^m (x-b)^n} \text{ Where m, n are positive integers and } m \leq 2, n \leq 2$$

Definite Integral :

Define Integral as the limit of a sum, Define integrals of x , x and of a constant, from above definition, Fundamental theorem of Integral Calculus (statement only). Applications in simple cases. Properties of definite integral

$\int_a^b f(x) dx = \int_a^c f(x) dx + \int_c^b f(x) dx$; $\int_a^b f(x) dx = -\int_b^a f(x) dx$; $\int_a^a f(x) dx = 0$

where c is a point between a and b.

$\int_a^a f(x) dx = 0$; $\int_a^a f(x) dx$, applications to odd and even functions.

$\int_a^b f(x) dx = \int_a^b f(x) dx$, applications to odd and even functions.

Differential Equations :

(10 Marks)

Formation, order and degree of differential equations. Solution of first order and first degree differential equation of the form $\frac{dy}{dx} = f(x) + g(y)$, $\frac{dy}{dx} = \frac{ax + by}{cx + dy}$

and of the form $\frac{dy}{dx} = f(x)$, use of initial conditions.

5. Application of Calculus :

(24 Marks)

Tangent and Normal : Geometric interpretation of differential coefficients, Slope of a tangent. Equations of tangent and normal to curves of the form $y = f(x)$ at the point (x_1, y_1) ; and application to circle, parabola, ellipse, hyperbola. Condition that the st. line $y = mx + c$ may be a tangent / normal to a circle or to a curve.

Differential coefficient as rate measurer.

Maxima and Minima : Idea of Maxima and Minima of $y = f(x)$ at a point where $\frac{d^2y}{dx^2} \neq 0$ (statement only) Application to algebraic functions, $\sin x$, $\cos x$.

Determination of areas in simple cases :

Interpretation of a definite integral as an area. Calculation of areas bounded by circle, parabola and ellipse, ordinate and abscissa as the case may be. (Sketch of the areas is needed).

Expression for velocity and acceleration :

Expression for velocity and acceleration of a particle in terms of derivatives.

velocity = $\frac{ds}{dt}$, acceleration = $\frac{dv}{dt} = \frac{d^2s}{dt^2} = v \frac{dv}{ds}$

where s represents the displacement.

With the above expression for velocity and acceleration to establish the formula $v = vt$ (v constant velocity),

$$v = u + at, S = ut + \frac{1}{2} at^2, v^2 = u^2 + 2as. \text{ Simple applications.}$$

Vertical motion under gravity.

BIOLOGICAL SCIENCE CLASS XI

Full marks - 100
Full Marks - 80

Theory

- Nature and Scope of Biological Science (2 Marks)**
Status of Biology, Science of Life, Biology in ancient period (Mention Charak, Susruta, Aristotle, Darwin), Scope of Biology, Importance of Biological Science in this millennium.
- Unit of Life (6 Marks)**
Tools and techniques (Microscopes-Simple and Compound with diagram, EM [Brief idea]), Cell Fractionations and Tracer Techniques (Principle and use of ¹⁴C, ³H, ³⁵S, Cell as the basic unit of life, Discovery of cell, Cell Theory, Ultra structural components of the cell wall, Plasma-membrane, Plasmid, Endoplasmic Reticulum, Golgi Bodies, Mitochondria, Ribosomes, Lysosomes, Nucleus, Centrosomes, Microtubules, Microbodies, Microtubules, Cytoskeleton, Cilia and Flagella
- Cell Function (5 Marks)**
Diffusion-Definition and Factors, Osmosis- Types, Membranes, Plasmolysis and Deplasmolysis, Absorption-Active and Passive transport with mechanism, Osmoregulation in fresh water and marine animals.
- Enzymes (4 Marks)**
Definition and Properties, Types with examples, Mechanism of Action (Lock and Key, Allosteric, Regulation of Enzyme action)
- Chromosome (3 Marks)**
Morphology of Chromosomes, Parallelism between gene and chromosome, Chemical Properties-Types of Nucleic Acids and differences, Physical structure of DNA-Watson and Crick Model, Replication of DNA (Brief idea), Types of RNA (mRNA, tRNA, rRNA) Mode of transcription (Brief idea), NA as the genetic material (Experiments on bacterial transformation and viral transduction), Definition of Euchromatin and Heterochromatin and differences, Brief idea of polytene and Lamp brush chromosomes.
- Cell Division (5 Marks)**
Cell cycle and phases (control mechanism excluded), Important characters of malignant cell, Process and significance of meiosis (With diagram)
- Genetics (5 Marks)**
Laws of Heredity (Mendel's Laws of Heredity), (i) Backcross, Test cross, Incomplete dominance, Multiple Gene, Linkage, Crossing Over, (ii) Sex linked inheritance-Colour blindness, Haemophilia, Mutation-Definition and types Importance of mutation Gene structure and function, Mechanism of protein synthesis, (Brief idea), Genetic code.
- Respiration (5 Marks)**
Mechanism of glycolysis, Krebs' cycle (Flow chart only, no enzyme but A, T, P, H₂O and CO₂ calculation), Outline idea of Electron Transport system, Relationship of photosynthesis and respiration, Application of Fermentation
- Taxonomy (5 Marks)**
Definition, Importance, Relations of taxonomy with the classification of plant Kingdom, Rules of Binomial Nomenclature, Hierarchy and Key, Types of classification, Classification of plant kingdom, Salient features of different groups (Algae, Fungi, Bryophyta, Pteridophyta, Gymnosperm, Angiosperm, (monocot and dicot), with examples of economically important plants of major groups (Some economically important plants (Mention uses and edible parts only): Algae-Spirulina, Fungi-Mushroom, Bryophyta- Sphagnum, Pteridophyta-Marsilea, Gymnosperm-Pine, Angiosperm-Monocot-Bamboo Dicot-Jute or Lemon, Life Cycle (in word diagram) with special reference to alternation of generations-Definition, Types. (Comment: Five salient features of each group. Figures of at least Two specimen from each group.)
- Origin and Evolution of Life (4 Marks)**
Haldane and Oparin concept of the Origin of Life, Distribution of Life form in time and space (Through charts), Modern concept of Natural Selection, Mimicry and Coevolution, Speciation and isolation, Species concept, Human Evolution (in brief), Biodiversity.
- Population Biology & Social Physiology (7 Marks)**
Concepts of Population Growth, Population control, Mental health, Tobacco smoking and chewing, Alcoholism and alcoholism, Drug addiction, Global immunization, Balanced Diet - Balanced diet for infants, growing children, students, pregnant woman and aged (in tabular form). Malnutrition and causes of PCM, Marasmus, Kwashiorkor. Iron and Iodine Deficiency (Brief idea) Brief idea of in vitro fertilization Sexually transmitted diseases - Syphilis, Gonorrhoea, AIDS and its Prevention.

- Hepatitis B and its prevention, Polio-immunization (Pulse Polio) Amniocentesis and inequality of sexes, Female foeticide
- Environmental Biology (7 Marks)**
Definition of Ecosystem and its dynamics (Detritus, biogeochemical cycles in brief), Concepts of Biosphere, with special reference to Sundarban, Auto-ecology, Synecology, Environmental Pollution- Concept of pollution of water, soil and air, Source and nature of pollutants, Effects and probable control strategies of water and air Pollution (Brief description), Concept of noise pollution and radioactive hazards, Biomagnification, Bio accumulation, 3 diseases due to excess absorption of metallic compound in blood, Pb-Diseases, Hg-Minamata, Cd-Etai Etai, Green House Effect on biological system, Acid Rain, Ozone hole BOD, COD, Thermal pollution, Green Bench Pollution Control Board and its role, Earth Summit, Toxicology of industrial wastes, Wet land as nature's kidney.

- Application of Biology (8 Marks)**
(a) Biofertilizers Pesticides and Biological Pest Control-Benefits and Hazards, (b) Domestication of animals and plants, Conservation of endangered Species (with examples, 2 from plant, 2 from animal) Red Data Book, Green Data Book, Insects and their products-Seri Api and Lac culture, Biotechnology and its applications, (c) Cloning and transgenic-Application in microbes, plants and animals, (d) Sperm and Ova bank, surrogate mother, test Tube Baby, (e) Totipotency of cells and maintenance of cell line, (f) Idea about plant cell and tissue culture, micropropagation, (e) Role of phytochromes in horticulture and agriculture, (f) Bio-medical application (maximum two for each of the following) (i) Diagnostic instruments: ECG, EEG, Auto-analyzer (ii) Imaging-USG, CT Scan, X-ray, Fluoroscopy, MRI (iii) Therapeutic: Laser Therapy, Dialyzer, Pacemaker (Reserve and Artificial), Heart-Lung Machine.

Project Identification 10 Marks
(10 Marks)

BIOLOGICAL SCIENCE CLASS XII

Full marks - 100
Full Marks - 80
Marks -25

Theory Group A

Botany

- Virus and Bacteria (5 Marks)**
Characteristics of Animal Virus (Influenza Virus) and Bacteriophage (T2), Reproduction, (Comment: 4 characters with diagram), Structure of TMV (Comment: Diagram), Structure of typical Bacterial cell (E. Coli) and Reproduction: Asexual, sexual, (Comment: Diagram), Brief Bacterial Classification on the basis of (a) Morphology, (b) Nutrition type, (c) Staining behaviour, (d) Thermal sensitivity, (e) On the basis of flagella (Comment: Chart and 1 example of each type), Utility of Bacteria (a) Agricultural-Rhizobium and other nitrogen fixing bacterial, (b) Commercial-Beneficial for food producing, tanning and in brewery, (C) Medicine - Antibiotics and Vitamin synthesis.
- Tissue and Tissue Systems (5 Marks)**
Tissue: Definition, Types - Meristematic and permanent tissue. (Comment with characterization and function) (Emphasis on permanent complex tissues) Concept of cambium and secondary growth. (Comment: Chart and diagram of each type). Tissue Systems Definition: Types - (a) Epidermal with examples of Root hair, Stem hair and stomata. (Comment: Diagram) (b) Ground (Comment: Charts and diagram) (c) Vascular - types with examples Stele - its major types (Comment: Charts and diagram)
- Forms and Functions of Plant (5 Marks)**
Morphological Features and Functions of:
A. Root - Morphology and functions of tap and adventitious roots. (Comments: Diagram) (a) Differences between Tap and Adventitious Roots. (B) Modifications - Root, Prop root, Pneumatophore, Epiphytic root-Functions-Uses, Examples
B. Stem: Introduction - Morphology and Functions. Modifications Sub-aerial-Off set-Water hyacinth, Under ground-Potato, Aerial Phylloclad - Cactus, Thorn - Duranta, Bulb - Dioscorea (Comment: Definition, Example and figure)
C. Leaf - Morphology, functions, Phyllotaxy - Types with example, Stipule - Normal two types: (a) Free lateral - China rose (b) Adnate - Rose, Modified two types: (a) Folioaceous - Pea, (b) Spinous - Acacia, Leaf Modifications: Spine of Cactus, Pitcher plant, phylloclad. (Comment: All examples should be explained with figure). Types of leaves: Simple, Compound - pinnate, palmate (mention all subdivisions), (Comment: In a chart, with example and diagram) (Homophily and Heterophily).

- (Comment: Mention only with diagram)
D. Flower (a) Typical flower (China rose) - Different parts, Flower as a modified shoot. Types of flower - regular, irregular, actinomorphic, zygomorphic. (Comment: Examples with diagram) Cohesion and adhesion of stamens: Monadelphous, Diadelphous, Polyadelphous, Epipetalous, Episepalous, Gynandrous, Relative Position of Different whorls of flower on the thalamus: (Comment examples with line diagrams) Hypogynous, Perigynous, Epigynous, Types of Ovary - Superior, Inferior, Placentation, Aestivation - Definition, (Comment examples of Musaceae and Malvaceae) (b) Floral Formula: Definition, Symbols used in floral formulae, Floral formulae of the following families / plants - Monocot - Banana (Musa paradisiaca) Family - Musaceae Dicot - China Rose (Hibiscus rosasinensis) Family - Malvaceae, (c) Inflorescence - Definition, major types - (i) Cymose - Definition with Example (ii) Racemose - Definition with Example (Comment: Detailed Classification not required. All types should be explained with line drawings and real figures.) (c) Pollination: Definition, Types - Self and cross pollination, Agents of pollination, Characteristic features in relation to pollination types, Merits and demerits of Self and Cross Pollination (Briefly) (e) Fertilization - Process of double fertilization in a flowering plant. (Comment: Diagram)
E. Fruit: Definition only with examples. Types: True and False, True: Simple - Mango (Comment: Figure with L.S.) Aggregate: Custard apple (Comment: Figure with L.S.) Multiple - Jack fruit or Pine apple (Comment: Figure with L.S.) False: Apple, F. Study of Seeds: Dicot & monocot, Edible parts of some known fruits - Apple - Thalamus - Dikena - Carya; Pomegranate (Bedana) - Succulent testa, Mango - Mesocarp - Peco-Cotyledon, Coconut - Endosperm; Rice-Endosperm, Dispersal of fruits and seeds. Types with examples, Description of a monocot & dicot plant (Comment: Rice & Pea with charts).
Plant Breeding: Definition, significance. 1. Hybridization: Definition, Hybridization Technique: Emasculation, 2. Breeder's KII (Brief idea) (Comment: with charts and diagrams), 3. Micropropagation.

- Photosynthesis (5 Marks)**
Major Photosynthetic pigments, Outline concept of light and dark reaction phases, Basic idea of bacterial photosynthesis, C₃, C₄, C₅ pathway, CAM, (C₃ and CAM in brief, with diagram only), Photorespiration.
- Growth Metamorphosis and Aging (5 Marks)**
Phases and factors of Growth, Differences between plant growth and animal growth, Grand period of Growth, Difference between growth and development, Metamorphosis-Definition, Types and role of Hormones, Senescence and aging of plants and animals and its factors, Abscission, Phytomerons, Growth of seedling and the role of Gibberellic acid, Photorespiration.

Group - B Zoology Marks - 25

- Classification of Animal Kingdom (4 Marks)**
(A) Classification with salient features of each phylum: Non-chordates up to phylum; Example of each phylum, (B) Chordates: Characteristics of Hemichordata, Urochordata, Cephalochordata with examples, (C) Vertebrata: Characteristics of Agnatha, Gnathostomata, Osteichthyes, Chondrichthyes, Amphibia, Reptilia, Aves, Mammalia with example, (D) Mammalia: Salient features of Protheria, metatheria and Eutheria. (Comment: Minor coelomate and acoelomate phyla excluded)
- Outline features of mammalian form (Eutherian) Guinea-pig (Cavia porcellus) (6 Marks)**
(A) External features (B) Digestive System with special reference to Coprophagy or Caecotrophy, (C) Respiratory System (D) Anatomy of Heart together with flow chart of blood circulation through heart (E) Arterial System - Distribution of main arteries only (F) Venous System - Distribution of main veins with special reference to Hepatic portal System, (G) Excretory System (H) Reproductive System (Comment: Necessary diagram for each system to be drawn)
- Outline knowledge of Medical Zoology (4 Marks)**
(A) Outline idea of disease, their causative organism, mode of infection, symptoms and preventive measure of: (i) Malaria, (ii) Filaria, (iii) Ascariasis, (iv) Taeniasis, (B) Distinguishing features of Culex, Anopheles and Aedes, (C) Life Cycle and Comparative study of Culex and Anopheles, (D) Control measures of mosquito

- (Comment: Mention other mosquito borne disease - like encephalitis, meningitis; Tsetse fly carrying Trypanosoma causing sleeping sickness; Leishmania causing Kala-azar).

- Outline Knowledge of Agricultural Zoology (6 Marks)**
A. Fishery - Pisciculture (i) Briefly explain with example - Major Carp, Minor Carp, (ii) Comparison between major and minor carp, (iii) Brief idea with example of exotic fish (iv) Mechanism of induced breeding-hypophysation, (v) Management of - Culture of major carp, composite culture and composite mixed culture, (vi) Common diseases of carp - Gill rot, fin rot tail rot, Dropsy.
B. Pests and their management (i) Definition of Pest (ii) Types of Pest - (A) Mammalian pest - Nature of damage by Bandicoots bengalensis (B) Insect pest-Mention the names of Trypoxys incertulus, Lepidocnisa acuta, (C) Outline idea of biological control of insect pest - control of mosquito by Gambusia, Panchax, Talspia, etc.
5. **Outline idea about Economic Zoology (5 Marks)**
(A) Poultry - Types of poultry birds; high yielding varieties of poultry birds (B) Prawn Culture - Methods with special reference to tiger prawn (C) Pearl Culture Importance of pearl culture (D) Apiculture - Types of honey bee (drones, workers, queen); Composition and uses of honey (E) Sericulture - Types of mulberry plants; Definition of Silk, types of silk and silk worm (Muga, Endi, Tusore and mulberry silk) Life cycle of mulberry silk worm with reference to diapause and vernalism. Structure of silk worm larva and silk gland, Disease of silk worm - Flacherie, Muscardine, grosserie, petrine. Control of Muscardine only.

Group - C Physiology Marks - 30

- Conservation of matter and energy in the human system (5 Marks)**
A) **Nutrition:** Basic Constituents of food and their nutritional significance, B, M, R - factors controlling Respiratory quotient (definition and significance only), (Vitamins - dietary sources, functions, deficiency symptoms (in tabular form), Provitamin, Antivitamin, Pseudovitamin, Hyper-Vitaminosis (Definition only) Nitrogen Balance, Biological and Nutritional value of protein.
B) **Biochemistry and Metabolism:** Classification and properties of carbohydrates, lipids and proteins, Metabolism (biochemical only), Elementary idea only of the following metabolic pathways (only biochemical pathways, no enzyme names needed): Glycogenesis, glycogenolysis, Gluconeogenesis, Oxidation of fatty acids, Ketone body formation and its significance, Amino acid pool, Deamination, Transamination and Decarboxylation. (Definition only), For glycolysis, Krebs Cycle and electron transport chain.
C) **Alimentation:** Structure in relation to junctions of the alimentary canal and the digestive glands; Functions of the digestive juices including bile (Saliva, Gastric, juice, pancreatic juice, intestinal juice), Digestion and absorption of carbohydrates, lipids and proteins in tabular form.
Clinical conditions of G-1 system: Soury, Peptic and Gastric ulcers, Gastritis, Cirrhosis of Liver, Colon cancer, Stenosis, Fasting and obesity.
- Blood and the body fluids (4 Marks)**
Composition and function of Blood, Blood Coagulation - Process in brief and anticoagulants, Use of Na-citrate as anticoagulant in blood bank, Blood group - ABO System and Rh factor, Blood Transfusion, Lymph and tissue fluid formation and function.
- Cardio Vascular System (3 Marks)**
Anatomy of the Heart, Junctional tissues of the heart, Origin and Propagation of cardiac impulse, Histological structure of arteries, veins and capillaries Cardiac Cycle - Atrial and ventricular events only, Cardiac Cycle Time, Heart sound Cardiac output - Definition, Stroke volume and Minute volume, Principle of measurement only, (Fick method), Blood Pressure, Factor controlling & Measurement, Causes of common cardio - vascular Diseases - Dietary Factors, Smoking, Stress, Diabetes, Alcoholism, Cyanosis (Blue Baby)
- Respiratory System (3 Marks)**
Respiratory tract: From Larynx-Lung, Mechanism of breathing - role of respiratory muscles: intercostal muscle and diaphragm only, Significance of physiological and anatomical dead space, Tidal volume, insp. and expiratory reserve volumes, residual volume, vital capacity, (Definition & Val Only), Composition of inspired, expired and alveolar air, Active and Passive smoking, Common Respiratory Diseases and their causes - Asthma, Tuberculosis, Lung Carcinoma, Hypoxia, Anoxia, Apnoea, Dyspnoea. (Definition only), Mountain sickness and acclimatization. (In brief)



SYLLABUS

- 5. Nerve and Muscle – The Excitable Tissue (2 Marks)**
Different types of muscles and their structure (in brief with diagram) Red and white muscle, Fast and slow muscle. Properties of muscle – (1) Excitability, (2) Contractility, (3) All or None Law (4) Refractory Period, (5) Summation of stimuli, (6) Tetanus, (7) Rigor Mortis, Sarcotubular System and the mechanism of muscle contraction. Isometric and isotonic muscle contraction. Receptors – Classification in brief (According to function). Synapse – Structure and mechanism.
- 6. Nervous System (3 Marks)**
A Brief outline of the organization and basic function of N. System (Central & Peripheral). Functions of 5 Major Parts of the Brains – Cerebral Cortex, Thalamus, Pons, Cerebellum, Medulla. Cranial Nerves: Distribution and function Ventricles of the Brains and C. S. F. Sp. Cord. – Structure and Major Functions, Reflex Arc (Types) and Reflex Action: Conditioned and unconditioned reflexes. Functions of the Autonomic Nervous System. Nervous System – Sympathetic and Parasympathetic: Functions.
- 7. Endocrine System (2 Marks)**
Definition of Endocrine gland and hormones. Classification of Hormones. Elementary Idea of Hormone Action. (Proteins and Steroid Hormones). Functions and disorders and related diseases of the following glands: (i) Pituitary (ii) Thyroid (iii) Pancreas (iv) Adrenal (v) Parathyroid (vi) Placenta. Elementary ideas of gastrointestinal hormones. Prostaglandins – Definition and Functions.
- 8. Excretory System (2 Marks)**
Diabetes insipidus. Normal and Abnormal Constituents of urine. Accessory Excretory organs – Skin, Liver, Salivary Gland, Large Intestine (mention only).
- 9. Skin and Body Temperature Regulation (1 Marks)**
Physiology of sweat secretion, Sensible and insensible perspiration. Role of hypothalamus in body temperature regulation.
- 10. Reproduction and Developmental Biology (4 Marks)**
Primary and Secondary sex organs and the secondary sex characters. Testis – Histology, Testicular Hormone and their functions. Spermatogenesis with structure of sperm. Ovary – Histology. Ovarian hormones and their functions, oogenesis with structure of mature graafian follicle. Menstrual cycle and estrus cycle. (Brief idea) Fertilization and Implantation. A brief idea about cleavage, morula, blastula and gastrula formation.
- 11. Immunology (3 Marks)**
A brief idea of antigen and antibody. Elementary knowledge of inherited, acquired, humoral, Cell mediated immunity. Active and passive immunity.

PRACTICAL Full marks - 20

- Experiment (15 Marks)**
a) Botany (5 Marks), b) Zoology (5 Marks), c) Physiology (5 Marks)
- Laboratory Note Book (3 Marks)**
- Herbarium (2 Marks)**

COMPUTER SCIENCE

THEORETICAL CLASS XI Full marks - 70

- A. Brief Review of Computer Systems (20 Marks)**
Computer Organization: CPU, Memory, I/O Storage, Devices and other peripherals. Storage Media, Access Characteristics etc.
Data Representation: Review of Number Systems: Binary, Octal, Hexadecimal. Conversion of binary to decimals, binary to Octal, Hexadecimal and vice-versa. Different methods of negative number representation's complement, 2's complement and signed magnitude.

Topics on Boolean Algebra: Review of logical operation: Combinational - Logic functions - Basic gates and realization of complex functions, De-Morgan's theorem. Universal gates, Multiplexers, Decoder, Encoder, De-Multiplexers.

Boolean Arithmetic: Half Adder, Full Adders, Half Subtract or, Full Subtract or, Multiplication Booth's Algorithm.

- B. Operating Systems (10 Marks)**
Functions and role of operating system; Familiarities with different commands and utilities; DOS and Windows. Study of Unix / Linux with respect to commands and utilities.
- C. Programming with C (30 Marks)**
Concept of Algorithms and Data Structure, Character set, Constants, Variables, Operators. Head section, control structure, loop structure, Arrays, concept of pointers, functions, library functions, structure, concept of files, Input / Output operations, Simple problem solving.

PRACTICAL Full marks - 30

- A. Familiarization with Computer system and Operating System Commands. (10 Marks)**
- B. Problem Solving Using C: Algorithm Design, Coding, Compilation / Linking / Loading (Solving 10 / 12 Problems) (20 Marks)**

THEORETICAL CLASS XII Full marks - 70

- A. Fixed and Floating Point Representation of Real Number, Bit Map representation (5 Marks)**
- B. Sequential Logic Circuits-Flip-Flops, Registers and Counters-Synchronous and Asynchronous Concepts (5 Marks)**
- C. Manipulation of Data Structure and I/O Files using C-Language (10 Marks)**
- D. Computer Networking (25 Marks)**
Concept of LAN and WAN, Protocols, TCP / IP, Concept of Internet & Intranet, IP Address, URI, Dial-up and Leased Line Connection, Bandwidth, Internet applications-Email, Web-Browsing, Telnet, FTP, etc., Network Security Concepts, Introduction to client server computation.
- E. Introduction to DBMS (Relational) (25 Marks)**
Record structure, File Organization and Access Methods, Concept of Keys for data retrieval, Physical Storage organization, Basic concepts of Relational data base, Normalization (up to 3 NF), Introduction to SQL, (exposure to DDL, DML & DCL), Query Processing & Report generation.

PRACTICAL Full marks - 30

- Programming for Manipulation Data structures Files (10 Marks)**
- Interaction with RDBMS and SQL (5 Marks)**
- Web Interaction (5 Marks)**
- Project Work and Viva-Voce (10 Marks)**

ENVIRONMENTAL EDUCATION

CLASS XI - XII Full marks - 100

1. Man & Environment, 2. Environment and Development, 3. Environmental Pollution and Global Issues, 4. Energy, 5. Biodiversity, 6. Environmental Management, 7. Sustainable Development, & Sustainable Agriculture.

- N.B.** 1. A Student shall have to study Environmental Education as a compulsory subject.
2. The book along with the detailed contents of the syllabus of Environmental Education will be published by the Council and communicated shortly.