



AMPAI

Association of Minority Professional Academic Institutes

INFORMATION BROCHURE WITH SYLLABI

COMMON ENTRANCE EXAMINATION ASSOCIATION OF MINORITY PROFESSIONAL ACADEMIC INSTITUTES CEE AMPAI - 2014

FOR ADMISSION TO

- Engineering • Technology • Pharmacy

Under WEST BENGAL UNIVERSITY OF TECHNOLOGY



**ASSOCIATION OF MINORITY PROFESSIONAL
ACADEMIC INSTITUTES**

AMPAI

Information Brochure

Common Entrance Test Association of
Minority Professional Academic Institutes - 2014

CEE AMPAI – 2014

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1. Common Entrance Examination - Association of Minority Professional Academic Institutes (CEE AMPAI- 2014)

About CEE AMPAI - 2014

The prime objective of **Common Entrance Examination Association of Minority Professional Academic Institutes CEE AMPAI - 2014** is to conduct an entrance examination for Sikh Minority and Christian Minority students in the State and National level. Students of Other Minority and Non-Minority in the State and National level may also appear in the CEE AMPAI - 2014. This examination will be conducted both for B.Tech and B.Pharm courses. The examination will be held for admission in the following institutes:

SL.	COLLEGE NAME	COURSES	STATUS
1.	JIS College of Engineering, Kalyani, W.B (www.jiscollege.ac.in)	ECE, CSE, IT, EF, BME, EIE, CIV, ME	Sikh
2.	Narula Institute of Technology, Kolkata (www.nit.ac.in)	ECE, CSE, IT, EE, EIE, CIV	Sikh
3.	Guru Nanak Institute of Technology, Kolkata (www.gnit.ac.in)	ECE, CSE, IT, EE, EIE, FT	Sikh
4.	Guru Nanak Institute of Pharmaceutical Science & Technology, Kolkata (www.gnipst.ac.in)	B. Pharm	Sikh
5.	St. Mary's Technical Campus Kolkata (www.stmarysgroup.com)	ECE, CSE, CIV, ME, EEE	Christian

* As per nomenclature prescribed by WBJEEM 2014

The Common Entrance Examination – 2014 will be conducted for admission to different degree level courses in Engineering & Technology and Pharmacy in the AMPAI enlisted colleges as mentioned above based on the following subject combination:

SI No.	Availability of courses for admission through CEE AMPAI 2014	Candidates have to appear in the following subjects
I	B Tech / B Pharm	Mathematics / Biology, Physics, Chemistry

Note on subject of examination for Pharmacy candidates:

For the Pharmacy College, the score in Physics and Chemistry will be considered along with the better score of either Mathematics or Biology.

2. About AMPAI

Association of Minority Professional Academic Institutes (AMPAI) is a registered body under West Bengal Society Registration Act 1961, vide Reg. No. S/1L/76255 Dt. 15/12/2010. The Association was established in the year 2010, comprising the colleges: **JIS College of Engineering, Narula Institute of Technology, Guru Nanak Institute of Technology, Guru Nanak Institute of Pharmaceutical Science & Technology for Sikh Minority students and St. Mary's Technical Campus Kolkata for Christian Minority students. AMPAI** aims in creating a transparent, competitive examination and evaluation process for the selection of proficient candidates for the respective courses and giving leverage to minority students by offering them with equal education opportunities.

3. Schedule of Examination CEE AMPAI– 2014

Date of Examination	Subject, Marks and Timing of Examination		
03.05.14 (Saturday)	Mathematics 100 Marks 9.00 a.m. - 10.30 a.m.	Physics & Chemistry 75 marks each (Total 150 marks) 11.30 a.m. - 1.30 p.m.	Biology 100 marks 2.30 p.m. - 4.00 p.m.

4. Pattern of Questions & Mode of Answering

4.1 Question Pattern:

Questions will be based on the syllabus for **WBJEEM - 2014** (details available at www.wbjeeb.in and APPENDIX – I). In every subject, all questions will be Multiple Choice Questions (MCQ-type) with four options against each of the questions and the answer(s) to each of the questions has/have to be marked on the OMR Answer Sheet.

Questions will be of two categories, divided as per the following table:

Subject	Category 1	Category 2	Total Marks
Mathematics	60 X 1 mark each	20 X 2 marks each	100
Biological Sciences	60 X 1 mark each	20 X 2 marks each	100
Physics	45 X 1 mark each	15 X 2 marks each	75
Chemistry	45 X 1 mark each	15 X 2 marks each	75

There is no negative marking.

Category 1:

- Only one option is correct, correct response will yield one mark.
- For more than one answer indicated against a particular question in the OMR sheet; the said answer will be treated as incorrect response/answer.

Category 2:

- Only one option is correct, correct response will yield two marks.
- For more than one answer indicated against a particular question in the OMR sheet; the said answer will be treated as incorrect response/answer.

4.2 Mode of Answering:

Questions must be answered on specially designed machine readable answer sheets (OMR Answer Sheet). **ANSWERS ARE TO BE MARKED (BUBBLED) USING BLUE/BLACK BALL POINT PEN ONLY ON THE 'OMR ANSWER SHEET.'**

N.B. It is to be noted carefully that the candidates must fill in as well as bubble in ALL the relevant information including the “Question Booklet No. and Question Booklet Series” at the indicated places on both OMR Answer Sheet and Attendance Sheet during examination.

5. Ranking Methodology & Rules for Tie Breaking:

In CEE AMPAI-2014, there will be **two** separate merit lists: (i) Engineering (ii) Pharmacy

The merit list for successful candidates in the Engineering category will be prepared by listing them in the descending order of the total marks scored by them. However, there may be ties and such ties will be broken by sequentially applying the following set of rules:

1. More marks in Mathematics and Physics taken together
2. More marks in Mathematics and Chemistry taken together
3. More marks in Mathematics for only the 2 marks questions
4. More marks in Physics for only the 2 marks questions
5. More marks in Chemistry for only the 2 marks questions

For Pharmacy a separate merit list will be prepared. The list will be prepared as per the descending order of the total marks scored by them in Physics, Chemistry and Mathematics or Biological Science, whichever is greater (to be treated as 3rd subject). However, there may be ties and such ties will be broken by sequentially applying the following set of rules:

1. More marks in 3rd subject (Mathematics/Biology) and Physics taken together
2. More marks in 3rd subject (Mathematics/Biology) and Chemistry taken together
3. More marks in 3rd subject (Mathematics/Biology) for only the 2 marks questions
4. More marks in Physics for only the 2 marks questions
5. More marks in Chemistry for only the 2 marks questions

In generation of the Engineering and Pharmacy merit lists, if after applying the 5 rules stated above there are still ties, same will be broken by the date of birth (DOB) of the concerned candidates; the older candidate will be given preference over the younger one.

6. Eligibility Criteria for Candidates:

6.1 Citizenship: Applicant must be a citizen of India.

6.2 Age Restriction: Engineering & Technology / Pharmacy Courses:

Candidates must be at least 17 (seventeen) years of age as on 31.12.2014. There is no upper age limit. Date of Birth as recorded in Class X Examination under any School/Secondary Education Board Certificate/Admit Card will only be considered.

6.3 Domicile Certificate :

Candidates seeking admission in B. Tech / B. Pharm course under minority quota must submit the domicile certificate in prescribed format from competent authority along with application form.

6.3.1 The Domicile of any state shall be treated for those candidates who are

EITHER

Residing in any State / UT of India continuously at least for last 10 (ten) years as on 15.12.2013 (Proforma A-I and A-II)

OR

Whose parent(s) is / are permanent residents of any State / UT of India having permanent addresses within the State (Proforma B).

6.3.2 Procedure for Submission of Domicile Certificate :

Candidate must submit Domicile Certificate in either Proforma A-I or Proforma A-II or Proforma B, whichever is applicable for his/her case.

The 'Blank Proforma' is downloadable from www.ampai.in. Download the same and print it in duplicate on A4 sizewhite paper.

Get the Certificate filled in properly and duly authenticated/signed by a Competent Authority as specified in 6.3.3.

The Duplicate Copy of the Certificate is to be kept with the Office of the Issuing Authority for future reference/verification.

Photocopy of the Original Certificate in the name of the applicant and a photocopy of his/her parent's voter ID card are to be attached with the Confirmation Sheet.

Original Certificate need not be submitted with the Confirmation Sheet. The candidate must retain the same and shall have to produce it at the Reporting Centre during admission.

6.3.3 Competent Authority to issue Residential/Domicile Certificate:

In order to become eligible for admission to any category of seats in Engineering & Technology / Pharmacy Colleges Residential/Domicile Certificate has to be submitted by the intending candidate in Proforma given in the Appendix III of this Brochure. The applicable proforma is to be downloaded and printed on an A4 size white paper and will be required to be filled in properly.

Proforma A-I and Proforma B:

It must be signed and certified by any of the following competent authorities from Central Government or State Government having local jurisdiction over the place of the permanent residence of the concerned candidate or his/her parents, as the case may be, viz.

i) District Magistrate; ii) Additional District Magistrate; iii) Deputy Magistrate & Deputy Collector; v) Sub - Divisional Officer; vi) Block Development Officer;

vii) Superintendent of Police, viii) Additional Supdt. Of Police; ix) Sub Divisional Police Officer or Deputy Supdt. of Police, x) Commissioner, Additional Commissioner, Joint Commissioner, Deputy Commissioner, Assistant Commissioner of Police Commissionerate;

xi) Judicial Magistrate of any rank or position in the concerned district or Metropolitan locality or Judges / Judicial Officers of Hon'ble High Court at Calcutta or Hon'ble Supreme Court of India;

xii) Commissioner, Additional Commissioner, Joint Commissioner, Assistant Commissioner of Municipal Corporation; xiii) Executive Officer of Municipality;

xiv) Assistant Secretary/ equivalent or above in the Secretariat to the Government of any State or Central Government; xv) Deputy Director or above in the Directorate to the Government of any State or Central Government.

Every official certifying the Domicile Status of the candidate or his/her parents MUST provide one's FULL NAME, DESIGNATION, PLACE OF POSTING WITH ADDRESS, LANDLINE AND MOBILE NUMBER ALONG WITH THE EMPLOYEE'S IDENTITY CARD NUMBER. These details are MANDATORY. CERTIFICATION FROM ANY AUTHORITY OTHER THAN WHAT HAVE BEEN ENUMERATED ABOVE 'WILL NOT BE ACCEPTED.'

Note : No elected people's representative like municipal commissioner, councillor of Municipal Corporation, any elected member of three-tier Panchayat system or GTA, MLA or MP is entitled to issue such certificates.

Proforma A-II:

Domicile certificate in this proforma may be obtained from Head of the Institution from which the candidate has passed his/her 10+2 examination or will appear in his/her 10+2 examination. Such certificate may be issued based on verification of the school education record of the candidate. The proforma for such certificate is provided in the website and may be downloaded.

6.4. Academic Requirements :

After examination or admission, or during any stage thereof, if it is found on scrutiny that an applicant is under age or otherwise ineligible, his/her application for admission will be cancelled outright even if he / she appeared in **CEE AMPAI - 2014** and secured a position in the merit list. Permission to appear in **CEE AMPAI - 2014** or securing a rank in the merit list on the basis of the performance in the said examination does not constitute a right / guarantee in favour of the candidate for his / her admission.

6.4.1 For Bachelor in Engineering & Technology:

Candidates must pass Higher Secondary (10+2) Examination of West Bengal Council of Higher Secondary Education or equivalent examination from a recognized Council/Board with:

- Individual pass marks in Physics and Mathematics as compulsory subjects along with Chemistry/ Biotechnology/Biology/a Technical Vocational Subject (Engineering Drawing / Computer Science)
- Minimum of 45% marks in the above subjects taken together as well as pass in English with a minimum of 30% marks in the said qualifying examination of the Higher Secondary (10+2).

Note: Pass marks in any subject shall imply pass marks in theory and practical individually, if specified by the concerned Council/Board.

6.4.2 For Bachelor in Pharmacy Course:

Candidates must pass Higher Secondary (10+2) Examination of West Bengal Council of Higher Secondary Education or equivalent examination from a recognized Council /Board with:

- Individual pass marks in Physics and Chemistry as compulsory subjects along with Mathematics / Biotechnology / Biology / a Technical Vocational Subject (Engineering Drawing / Computer Science)
- Minimum of 45% marks in the above subjects taken together as well as pass in English with a minimum of 30% marks in the said qualifying examination of the Higher Secondary (10+2).

Note: Pass marks in any subject shall imply pass marks in theory and practical individually, if specified by the concerned Council / Board.

7. Availability of Seats, List of Colleges, Courses along with their Branch Codes :

Colleges	Courses	Branch Codes	Seats	Categories
JIS College of Engineering	Electronics & Communication Engineering	ECE	60	SIKH
	Computer Science Engineering	CSE	60	
	Information Technology	INT	45	
	Electrical Engineering	ELE	45	
	Bio-Medical Engineering	BMD	30	
	Electronics & Instrumentation Engineering	EIE	45	
	Civil Engineering	CIV	60	
	Mechanical Engineering	MEC	60	
Narula Institute of Technology	Electronics & Communication Engineering	ECE	60	SIKH
	Computer Science Engineering	CSE	60	
	Information Technology	INT	30	
	Electrical Engineering	ELE	60	
	Electronics & Instrumentation Engineering	EIE	30	
	Civil Engineering	CIV	60	
Guru Nanak Institute of Technology	Electronics & Communication Engineering	ECE	60	SIKH
	Computer Science Engineering	CSE	60	
	Information Technology	INT	30	
	Electrical Engineering	ELE	60	
	Electronics & Instrumentation Engineering	EIE	30	
	Food Technology	FET	30	

Guru Nanak Institute of Pharmaceutical Science & Technology	Bachelor in Pharmaceutical Science & Technology	PHE	60	SIKH
St. Mary's Technical Campus Kolkata	Electronics & Communication Engineering	ECE	30	CHRISTIAN
	Computer Science Engineering	CSE	60	
	Civil Engineering	CIV	60	
	Mechanical Engineering	MEC	90	
	Electrical and Electronics Engineering	EEE	30	

(Intake may change as per the norms of the Regulatory Authority.)

Note: Reservation under Minority quota (Sikh & Christian) :

Percentage of reserved seats declared as per discretion of the minority institutes and as per the notification by the Govt. of West Bengal.

8. Application and Submission Procedure:

- Candidates can download the Application Form from www.ampai.in.
- Application Fee of Rs.200/- has to be paid by DD in favour of **Association of Minority Professional Academic Institutes** payable at Kolkata.
- Duly filled up Application Form along with Examination fee can be submitted either in person or by post to the following address :

AMPAI Office, 7, Sarat Bose Road, 1st Floor, Dwarka Building. Kolkata – 700 020

- An SMS message will be sent to each candidate after receiving the Application Form.

9. Issue of Admit Card:

- Admit cards will be sent to the candidates by post. Admit card may also be collected from AMPAI office from the Venue Cities one day before the examination i.e on 2nd May 2014, Friday. The address of the AMPAI offices will be given in the Notification Section of www.ampai.in.

10. List of Examination Centre Locations:

The allocation of examination centre will be based on the choices given by the candidate during Application Form fill-up. Each applicant have right to choose maximum two centers. However, discretion of AMPAI in allocation of examination centre shall be final. **NO REQUEST FOR CHANGE OF ALLOCATED CENTRE WILL BE ENTERTAINED UNDER ANY CIRCUMSTANCES.** The list of Examination Centre Locations is given below:

CENTRE NAME	CENTRE CODE
Kolkata	01
Durgapur	02
Siliguri	03
Ranchi	04
Patna	05
Guwahati	06

The addresses of the examination centres will be mentioned in the admit cards

11. Evaluation and Declaration of Results of CEE AMPAI - 2014

The OMR answer sheets will be scanned and scored and result will be prepared in the following manner –

- Rank wise list of qualified candidates **separately for**

1. Minority Sikh and Christian (within State)

2. Minority Sikh and Christian (outside State)

3. Others (within State)

4. Others (outside State)

The result will be published in the **AMPAI website: www.ampai.in**

12. Legal Jurisdiction:

- All matters pertaining to conduct of CEE AMPAI-2014 shall fall within the jurisdiction of Kolkata only.

13. Procedure for Conduct of Examination:

- The Examination Hall will be opened 45 minutes before the commencement of the test. Candidates are expected to take their seats immediately after the opening of Examination Hall. If the candidates do not report in time, they are likely to miss some of the general instructions to be announced in the Examination Hall.
- Candidate must bring with them i) Admit Card of CEE-AMPAI 2014 ii) Admit card of Class / Std. Xth / XIIth examination as photo ID iii) Black / Blue Ball Point Pen.
- Candidates must show on demand the Admit Card (CEE AMPAI -2014) for admission to the Examination Hall. A candidate not possessing the Admit Card issued by the designated Authority shall not be allowed to enter in the Examination Hall by the Center-in-Charge.
- A seat indicating Roll No. will be allocated to each candidate. Candidates must find out and occupy their allotted seats.
- Candidates are not allowed to carry any textual material, printed or written, bits of papers or any other material except those listed under. Sl.No. 13.2 inside examination Hall.
- Mobile Phones, Calculators, Slide Rules, Log Tables, Electronic Watches with facilities of Calculator are not allowed in the Examination Hall. Possession of such items during the Examinations may lead to cancellation of candidature.

- 13.7. No candidate, without the special permission of the Centre-in-Charge or the invigilator concerned, will leave his/her seat or Examination Hall until the duration of examination for a paper is over. Candidate should not leave the hall without handing over their OMR sheet and question booklet to the invigilator on duty; otherwise this may lead to cancellation of the concerned paper.
- 13.8. It is to be noted carefully that the candidates must write the “Question Booklet No. and Question Booklet Series” at the indicated places both on the OMR Answer Sheet and Attendance Sheet during examination. Otherwise his/her OMR Answer sheet in the concerned subject will be cancelled.
- 13.9. Candidates shall maintain silence during the examination. Any conversation or gesticulation or disturbance in the examination hall shall be deemed as misdemeanor. If a candidate is found adopting unfair means, his/her candidature shall be cancelled and he/she will be liable to be debarred from taking examination either permanently or for a period according to the nature of offence.

If a candidate is found impersonating, his/her candidature may be cancelled outright and the concerned examinee will be handed over to the Police.

14. Counselling and Admission:

Detailed information regarding admission to the concerned Colleges and allotment of seats therein shall be made available in due course. It should be noted that being Merit Listed does not make a candidate eligible for admission to any concerned College.

- 14.1. Reporting and choice filling centres will be at Kolkata, Siliguri, Guwahati, Patna & Ranchi (Timing 10.00 A.M. to 5.00 P.M.)
- 14.2. The Counselling Process will be “Off Line” at Kolkata having real-time connectivity between all centres.
- 14.3. At reporting, choice filling and counselling centres, candidates have to report as per schedule.
- 14.4. Final merit list will be published in AMPAI office as well as in www.ampai.in
- 14.5. In counselling session, candidates have to produce original documents (i.e. marksheets of Class / Std.10th and 12th, DOB proof, Rank card of CEE AMPAI - 2014, Domicile Certificate from appropriate authority. If any candidate fails to produce proper Domicile Certificate in the prescribed proforma, then said candidate will be considered as Non-Minority candidate.
- 14.6. One set of attested copies of the above documents along with 4 copies of passport size photographs.
- 14.7. A Demand Draft of Rs.5000/- in favour of Association of Minority Professional Academic Institutes.
- 14.8. One seat will be allotted to each candidate as per his/ her choice based on interse merit and availability of seat at that point of time.
- 14.9. A Seat allotment letter will be issued to each candidate.

15. DOs AND DON'Ts

15.1 DOs:

- 15.1.1 Candidates have to bring one photo identification proof at the Examination Hall.
- 15.1.2 The photo identification may be Admit card of Class / Std.X /10+2 examinations.
- 15.1.3 Read the instructions carefully before filling-in of the Application Form.
- 15.1.4 Specify the Date of Birth correctly.
- 15.1.5 Choose the District and examination zones correctly.
- 15.1.6 Name of the candidate and complete mailing address with correct postal Pin Code (No.) should be filled up in designated places.

- 15.1.7 Paste colour photographs with gum so that it is not detached in any way.
- 15.1.8 Enter the examination hall only with your Admit Card and blue/black ball point pens.
- 15.1.9 Submit the OMR Answer Sheet to the Invigilator after completion of each session of Examination.
- 15.1.10 Write the Question Booklet No. in the specified places on both the OMR Answer Sheet and Attendance Sheet.

15.2 DON'Ts:

- 15.2.1 Don't staple or pin the photographs.
- 15.2.2 Don't attest both photographs.
- 15.2.3 Don't sign in capital letters.
- 15.2.4 Don't bring Mobile Phone, Calculator or any other Electronic Gadget inside the Examination Hall.

16. Important Dates

1. Publication of advertisement – 30.03.2014 onwards.
2. Application forms available in website www.ampai.in – 05.04.2014
3. Last date of receiving of Application form – 22.04.2014 upto 3.00 p.m. at AMPAI Office
4. last date of despatching Admit Card: 28.04.2014 (by post)
5. Admit Card may also be collected from AMPAI office of the venue cities one day before the examination (i.e. on 2nd May, 2014, Friday) between 11.00 a.m. to 4.00 p.m. on production of copies of all relevant documents. The address of the AMPAI office at different venue cities which will be given in the notification section www.ampai.in.
6. Date of Examination – 03.05.2014, Saturday
7. Expected Date of publication of results – 20.05.2014
8. Expected reporting and choice filling : 23.05.2014 to 26.05.2014 at Kolkata, Patna, Ranchi, Siliguri, Guwahati
9. Counselling will be commenced after the publication of 10+2 examination and well before the commencement of e-counselling WBJEEM-2014.

APPENDIX – I

SYLLABUS FOR CEE-AMPAI - 2014 PHYSICS

Mechanics & General properties of matter

1. Units and dimensions: Units of measurement, system of units, fundamental and derived units, S I units, Dimensional analysis. Methods of measurement: Vernier scale, screw gauge, analysis of errors, significant figures.
2. Scalars and vectors: Addition, subtraction, multiplication of vectors. Dot product and cross product
3. Kinematics in one, two and three dimensions, projectiles, uniform circular motion, centripetal force, centrifugal force, relative velocity.
4. Dynamics: Newton's laws of motion; inertial frames, uniformly accelerated frame (pseudo-forces), principle of conservation of linear momentum, rocket motion, centre of mass, impulsive forces, friction.
5. Work, Power and Energy, conservative and non-conservative forces, principle of conservation of energy, collision (elastic and inelastic).
6. Rotational motion : Torque, angular momentum and principle of conservation of angular momentum, moment of inertia, radius of gyration, moment of inertia of objects with simple geometrical shapes, rotational kinetic energy and rolling on horizontal surface

Gravitation : Newton's Law of gravitation, gravitational field and potential, acceleration due to gravity and its variation, escape velocity, Kepler's laws and planetary motion, motion of satellites, Geostationary orbit.

Elasticity : Hooke's law, elastic moduli, Poisson's ratio, elastic energy.

Hydrostatics and Fluid Mechanics: Pressure inside a fluid, Pascal's law, Archimedes' principle, hydraulic press. Surface energy and surface tension, capillary rise.

Viscosity, streamline and turbulent motion, critical velocity, Reynold's number, Stoke's law, Bernoulli's theorem and its application.

Vibrations : Simple Harmonic Motion(SHM), equation of motion, damped and forced vibrations, resonance, superposition of SHM.

Wave motion : Elastic waves, longitudinal and transverse waves, progressive waves, superposition of waves: interference, stationary waves, beats, vibration of strings, air columns, velocity of elastic waves in different media, Doppler effect.

Thermal Physics : Scales of temperature, thermal expansion of solids, liquids and gases, calorimetry, change of state of matter, latent heat, transition temperature, Transmission of heat: conduction, convection, radiation, Black body radiation, absorptive and emissive powers: Kirchoff's law of radiation, Wien's law, Stefan's law, Newton's law of cooling, Kinetic theory: mean free path, pressure of an ideal gas, mean and rms velocities of molecules of a gas, kinetic interpretation of temperature, degrees of freedom, equipartition of energy (statement only) application to mono atomic and diatomic gases.

Thermodynamics : First law of thermodynamics, equivalence of heat and work, intensive and extensive thermodynamic variables, reversible and irreversible processes, specific heats of gases, relation between C_p and C_v .

Optics : Reflection and refraction at plane and spherical surfaces, total internal reflection, thin lenses, power of a lens, combination of lenses and mirrors, deviation and dispersion by prisms, Simple and compound microscopes, astronomical telescope, human eye: its defects and remedies.

Coherent sources, interference of light, Young's double slit experiment.

Electrostatics : Coulomb's law, electric field and potential, flux of electric field, Gauss' law, electric field and potential due to an infinite line charge, charged infinite sheet, solid spheres and spherical shells. Electric dipole and field due to an electric dipole.

Capacitance, spherical and parallel plate capacitors, energy stored in a capacitor, series and parallel combination of capacitors.

Current Electricity : Electric current, drift velocity and mobility. Ohm's law, resistivity, combination of resistances in series and parallel, combination of cells.

Kirchoff's laws of electric network, Wheatstone bridge, Metre bridge, potentiometer. Heating effect of current, thermoelectricity, Seebeck and Peltier effect. Chemical effect of current, Faraday's law of electrolysis, primary and secondary cells.

Electromagnetism : Magnetic effects of Current, BiotSavart's law, magnetic field due to current flowing through

1. an infinitely long straight wire
2. circular coil
3. solenoid; Ampere's circuital law, Lorentz force, Fleming's left hand rule, force between two current carrying conductors, magnetic moment of a current loop, magnetic dipole, torque experienced by a current carrying coil in a uniform magnetic field, galvanometer, current sensitivity, conversion of galvanometer to voltmeter and ammeter.

Magnetic field of earth. tangent galvanometer, magnetic properties of materials : Diamagnetic, paramagnetic and ferromagnetic materials, permeability, susceptibility.

Electromagnetic induction : Magnetic flux, Faraday's laws of electromagnetic induction, Lenz's law, self and mutual induction, , Fleming's right hand rule, Alternating current, peak and rms value of alternating voltage and current; generator, D.C. motor and transformer

Qualitative idea of electromagnetic waves and electromagnetic spectrum.

Modern Physics : Bohr's atomic model for hydrogen like atom, hydrogen spectrum, x-ray emission, Moseley's law, wave particle duality, de Broglie's hypothesis, photoelectric effect .

Constituents of an atom, isotopes, mass defect, mass-energy equivalence, binding energy. radioactivity - α , β , γ radiation, half life, mean life, fission, fusion.

Electronics : Energy bands in solids, intrinsic and extrinsic semiconductors, p-n junction diode, rectifier, pnp and npn transistors, common emitter characteristics of a transistor.

Binary numbers, AND, OR, NOT, NAND and NOR gates.

MATHEMATICS

ALGEBRA

A.P., G.P., H.P. : Definitions of A. P. and G.P.; General term; Summation of first n-terms; A.M. and G.M.; Definitions of H.P. (only 3 terms) and H.M.; Finite arithmetic-geometric series.

Logarithms : Definition ; General properties; Change of base.

Complex Numbers : Definition and properties of complex numbers; Complex conjugate; Triangle inequality; Square root of complex numbers; Cube roots of unity; De Moivre's theorem (statement only) and its elementary applications.

Quadratic Equations : Quadratic equations with real coefficients; Relations between roots and coefficients; Nature of roots; Formation of a quadratic equation, sign and magnitude of the quadratic expression ax^2+bx+c (where a, b, c are rational numbers and $a \neq 0$).

Permutation and combination : Permutation of n different things taken r at a time ($r \leq n$). Permutation of n things not all different. Permutation with repetitions (circular permutation excluded).

Combinations of n different things taken r at a time ($r \leq n$). Combination of n things not all different. Basic properties.

Problems involving both permutations and combinations.

Principle of mathematical induction: Statement of the principle, proof by induction for the sum of squares, sum of cubes of first n natural numbers, divisibility properties like 2^{2n-1} is divisible by 3 ($n \geq 1$), 7 divides $3^{2n+1} + 2^{n+2}$ ($n \geq 1$)

Binomial theorem (positive integral index): Statement of the theorem, general term, middle term, equidistant terms, properties of binomial coefficients.

Infinite series : Binomial theorem for negative and fractional index. Infinite G.P. series, Exponential and Logarithmic series with range of validity (statement only), simple applications.

Matrices : Concepts of $m \times n$ ($m \leq 3, n \leq 3$) real matrices, operations of addition, scalar multiplication and multiplication of matrices. Transpose of a matrix. Determinant of a square matrix. Properties of determinants (statement only). Minor, cofactor and adjoint of a matrix. Nonsingular matrix. Inverse of a matrix. Finding area of a triangle. Solutions of system of linear equations. (Not more than 3 variables).

Sets, Relations and Mappings: Idea of sets, subsets, power set, complement, union, intersection and difference of sets, Venn diagram, De Morgan's Laws, Inclusion / Exclusion formula for two or three finite sets, Cartesian product of sets.

Relation and its properties. Equivalence relation - definition and elementary examples, mappings, range and domain, injective, surjective and bijective mappings, composition of mappings, inverse of a mapping.

Probability : Classical definition, addition rule, conditional probability and Bayes' theorem, independence, multiplication rule.

TRIGONOMETRY

Trigonometric ratios, compound angles, multiple and submultiple angles, general solution of trigonometric equations. Properties of triangles, inverse trigonometric functions.

Coordinate geometry of two dimensions

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.

Straight line : Slope of a line. Equation of lines in different forms, angle between two lines. Condition of perpendicularity and parallelism of two lines. Distance of a point from a line. Distance between two parallel lines. Lines through the point of intersection of two lines.

Circle : Equation of a circle with a given center and radius. Condition that a general equation of second degree in x, y may represent a circle. Equation of a circle in terms of endpoints of a diameter. Parametric equation of a circle. Intersection of a line with a circle. Equation of common chord of two intersecting circles.

Conics : Definition, Directrix, Focus and Eccentricity, classification based on eccentricity.

Parabola : Standard equation. Reduction of the form $x = ay^2 + by + c$ or $y = ax^2 + bx + c$ to the standard form $y^2 = 4ax$ or $x^2 = 4ay$ respectively. Elementary properties and parametric equation of a parabola.

Ellipse and Hyperbola : Reduction to standard form of general equation of second degree when xy term is absent. Conjugate hyperbola. Simple properties. Parametric equations. Location of a point with respect to a conic.

CALCULUS

Differential calculus : Functions, composition of two functions and inverse of a function, limit, continuity, derivative, chain rule, derivative of implicit functions and functions defined parametrically.

Rolle's Theorem and Lagrange's Mean Value theorem (statement only). Their geometric interpretation and elementary application. L'Hospital's rule (statement only) and applications.

Second order derivative.

Integral calculus: Integration as a reverse process of differentiation, indefinite integral of standard functions. Integration by parts. Integration by substitution and partial fraction.

Definite integral as a limit of a sum with equal subdivisions. Fundamental theorem of integral calculus and its applications. Properties of definite integrals.

Differential Equations: Formulation and solution of differential equations of the forms.

1. $dy/dx = f(x).g(y)$
2. $dy/dx = f(y/x)$
3. $dy/dx = (ax+by)/(cx+dy)$
4. $dy/dx = (a_1x+b_1y+c_1)/(a_2x+b_2y+c_2)$, $(a_1/a_2 = b_1/b_2)$
5. $dy/dx + p(x)y = Q(x)$
6. $d^2y/dx^2 + p_1 dy/dx + p_2y = 0$ with p_1 and p_2 constants.
7. $d^2y/dx^2 = f(x)$

APPLICATION OF CALCULUS :

Tangents and normals, conditions of tangency. Determination of monotonicity, maxima and minima. Differential coefficient as a measure of rate.

Motion in a straight line with constant acceleration.

Geometric interpretation of definite integral as area, calculation of area bounded by elementary curves and Straight lines. Area of the region included between two elementary curves.

CHEMISTRY

Atoms, Molecules and Chemical Arithmetic :

Dalton's atomic theory; Gay Lussac's law of gaseous volume; Avogadro's Hypothesis and its applications.

Atomic mass; Molecular mass; Equivalent weight; Valency; Gram atomic weight; Gram molecular weight; Gram equivalent weight and mole concept; Chemical formulae; Balanced chemical equations; Calculations (based on mole concept) involving common oxidation-reduction, neutralization, and displacement reactions; Concentration in terms of mole fraction, molarity, molality and normality.

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

Atomic Structure

Concept of Nuclear Atom - electron, proton and neutron (charge and mass), atomic number; Rutherford's model and its limitations; Extra nuclear structure; Line spectra of hydrogen atom.

Quantization of energy (Planck's equation $E = hv$); Bohr's model of hydrogen atom and its limitations,

Sommerfelds modifications (elementary idea); The four quantum numbers, ground state electronic configurations of many electron atoms and mono-atomic ions; The Aufbau Principle; Pauli's Exclusion Principle and Hund's Rule.

Uncertainty principle; The concept of atomic orbitals, shapes of s, p and d orbitals (pictorial approach) Radioactivity and Nuclear Chemistry

Radioactivity - α , β , γ rays and their properties; Artificial transmutation; Rate of radioactive decay, decay constant, half-life and average life period of radio-elements; Units of radioactivity, Numerical problems.

Stability of the atomic nucleus - effect of neutron-proton (n/p) ratio on the modes of decay, group displacement law, radioisotopes and their uses (C, P, Co and I as examples) isobars and isotones (definition and examples), elementary idea of nuclear fission and fusion reactions.

The Periodic Table and Chemical Families

Modern periodic law (based on atomic number); Modern periodic table based on electronic configurations, groups (Gr. 1-18) and periods. Types of elements-representative (s-block and p-block), transition (d-block) elements and inner transition (f-block / lanthanides and actinides) and their general characteristics. Periodic trends in physical and chemical properties-atomic radii, valency, ionization energy, electron affinity, electronegativity, metallic character, acidic and basic characters of oxides and hydrides of the representative elements (up to $Z = 36$). Position of hydrogen and the noble gases in the periodic table; Diagonal relationships.

Chemical Bonding and Molecular Structure

Valence electrons, the Octet rule, electrovalent, covalent and coordinate covalent bonds with examples; Properties of electrovalent and covalent compounds. Limitations of Octet rule (examples); Fajan's Rule.

Directionality of covalent bonds, shapes of poly-atomic molecules (examples); Concept of hybridization of atomic orbitals (qualitative pictorial approach) : sp , sp^2 , sp^3 and dsp^2 .

Molecular orbital energy diagrams for homonuclear diatomic species - bond order and magnetic properties.

Valence Shell Electron Pair Repulsion (VSEPR) concept (elementary idea) - shapes of molecules. Concept of resonance (elementary idea), resonance structures (examples). Elementary idea about electro negativity, bond polarity and dipole moment, inter- and intra- molecular hydrogen bonding and its effects on physical properties (mp, bp and solubility); Hydrogen bridge bonds in diborane.

Double salts and complex salts, co-ordination compounds (examples only), co-ordination number (examples of co-ordination number 4 and 6 only).

Gaseous state

Measurable properties of gases. Boyle's Law and Charles Law, absolute scale of temperature, kinetic theory of gases, ideal gas equation - average, root mean square and most probable velocities and their relationship with temperature.

Dalton's Law of partial pressure, Graham's Law of gaseous diffusion. Deviations from ideal behavior. Liquefaction of gases, real gases, van der Waal's equation; Numerical problems.

Chemical Energetics and Chemical Dynamics

Chemical Energetics - Conservation of energy principle, energy changes in physical and chemical transformations. First law of thermodynamics; Internal energy, work and heat, pressure-volume work; Enthalpy. Internal energy change (ΔE) and Enthalpy change (ΔH) in a chemical reaction. Hess's Law and its applications (Numerical problems). Heat of reaction, fusion and vapourization; Second law of thermodynamics; Entropy; Free energy; Criterion of spontaneity.

Chemical Equilibria - The Law of mass action, dynamic nature of chemical equilibria. Equilibrium constants, Le Chatelier's Principle. Equilibrium constants of gaseous reactions (K_p and K_c) and relation between them (examples). Significance of ΔG and ΔG° .

Chemical Dynamics - Factors affecting the rate of chemical reactions (concentration, pressure, temperature, catalyst). Arrhenius equation and concept of activation energy.

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

Physical Chemistry of Solutions

Colloidal Solutions - differences from true solutions; Hydrophobic and hydrophilic colloids (examples and uses); Coagulation and peptization of colloids; Dialysis and its applications; Brownian motion; Tyndall effect and its applications; Elementary idea of emulsion, surfactant and micelle.

Electrolytic Solutions - Specific conductance, equivalent conductance, ionic conductance, Kohlrausch's law, Faraday's laws of electrolysis, applications. Numerical problems.

Non-electrolytic Solutions - Types of solution, vapour pressure of solutions. Raoult's Law; Colligative properties - lowering of vapour pressure, elevation of boiling point, depression of freezing point, osmotic pressure and their relationships with molecular mass (without derivations); Numerical problems.

Ionic and Redox Equilibria

Ionic 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; Buffer solutions, buffer action and Henderson equation.

Acid-base titrations, acid-base indicators (structures not required).

Solubility and Solubility Products

Common ion effect (no numerical problems).

Redox Equilibria

Oxidation-Reduction reactions as electron transfer processes, oxidation numbers, balancing of redox reactions by oxidation number and ion-electron methods.

Standard electrode potentials (E°), Electrochemical series, feasibility of a redox reaction. Significance of Gibb's equation: $\Delta G^\circ = -nF\Delta E^\circ$ (without derivation), no numerical problems. Redox titrations with (examples); Nernst equations (Numerical problems).

Chemistry of Non-metallic Elements and their Compounds

Carbon - occurrence, isotopes, allotropes (graphite, diamond, fullerene); CO and CO₂ production, properties and uses.

Nitrogen and Phosphorus - occurrence, isotopes, allotopes, isolation from natural sources and purification, reactivity of the free elements. Preparation, properties, reactions of NH₃, PH₃, NO, NO₂, HNO₂, HNO₃, P₄O₁₀, H₃PO₃ and H₃PO₄.

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 and uses).

Halogen

Halogens - comparative study, occurrence, physical states and chemical reactivities of the free elements, peculiarities of fluorine and iodine; Hydracids of halogens (preparation, properties, reactions and uses), interhalogen compounds (examples); Oxyacids of chlorine.

Chemistry of Metals

General principles of metallurgy - occurrence, concentration of ores, production and purification of metals, mineral wealth of India.

Typical metals (Na, Ca, Al, Fe, Cu and Zn) - occurrence, extraction, purification (where applicable), properties and reactions with air, water, acids and non-metals.

Manufacture of steels and alloy steel (Bessemer, Open-Hearth and L.D. process). Principles of chemistry involved in electroplating, anodizing and galvanizing.

Chemistry in Industry

Large scale production (including physicochemical principles where applicable omitting technical details and uses of individual items).

Heavy Chemicals - Sulphuric acid (contact process), Ammonia (Haber's process), Nitric acid (Ostwald's process), sodium bi-carbonate and sodium carbonate (Solvey process).

Polymers, Polythene, Nylon-66, rubber from natural source, vulcanization.

Electrochemicals - sodium hydroxide, chlorine, bleaching powder as byproducts, Fuel Gases - LPG, CNG. Silicon carbide and silicones.

Environmental Chemistry

Common modes of pollution of air, water and soil. Ozone layer, ozone hole - important chemical reactions. Green House effect; Smog; Pollution of water by domestic and industrial effluents; Pollutants-pesticides, fertilizers and plastics.

Chemistry of Carbon Compounds

Hybridization of carbon - σ - and π -bonds.

Isomerism - constitutional and stereoisomerism; Geometrical and optical isomerism of compounds containing upto two asymmetric carbon atoms. IUPAC nomenclature of simple organic compounds - hydrocarbons, mono and bifunctional molecules only (alicyclic and heterocyclic compounds excluded). Conformations of ethane and n-butane (Newman projection only).

Electronic Effects

Inductive, resonance and hyperconjugation. Stability of carbocation, carbanion and free radicals; Rearrangement of carbocation; Electrophiles and nucleophiles, tautomerism in α -dicarbonyl compounds, acidity and basicity of simple organic compounds.

Aliphatic Compounds

Alkanes - Preparation from alkyl halides and carboxylic acids; Reactions - halogenation and combustion.

Alkenes and Alkynes - Preparation from alcohols; Markownikoff's and anti-Markownikoff's additions; Hydroboration; Oxymercuration - demercuration, reduction of alkenes and alkynes (H_2 /Lindler catalyst and Na in liquid NH_3), metal acetylides.

Alkyl halides - Preparation from alcohols; Formation of Grignard reagents and their synthetic applications for the preparation of alkanes, alcohols, aldehydes, ketones and acids; S_N1 and S_N2 reactions (preliminary concept).

Alcohols - Preparation from carbonyl compounds and esters. Reaction - dehydration, oxidation, esterification, reaction with sodium, $ZnCl_2/HCl$, phosphorous halides.

Ethers - Preparation by Williamson's synthesis; Cleavage with HCl and HI.

Aldehydes and Ketones - Preparation from esters, acid chlorides, gem-dihalides, Ca-salt of carboxylic acids. Reaction - Nucleophilic addition with HCN, hydrazine, hydroxyl amines, semi carbazides,

alcohols; Aldol condensation, Clemmensen and Wolff-Kishner reduction, haloform, Cannizzaro and Wittig reactions.

Carboxylic Acids - Hydrolysis of esters (mechanism excluded) and cyanides; Hunsdicker and HVZ reactions.

Aliphatic Amines - Preparation from nitro, cyano and amido compounds. Distinction of 1°, 2° and 3° amines (Hinsberg method); Reaction with HNO₂; Carbyl amine reaction.

Aromatic Compounds

Benzene - Kekule structure, aromaticity and Huckel rule. Electrophilic substitution - halogenation, sulfonation, nitration, Friedel Crafts reaction, ozonolysis. Directive influence of substituents in monosubstituted benzenes.

Amines - Preparation from reduction of nitro compounds; Formation of diazonium salts and their stability; Replacement of diazonium group with H, OH, X (halogen), CN and NO₂; diazocoupling and reduction.

Haloarenes - Nucleophilic substitution, cine substitution (excluding mechanism).

Phenols - halogenation, sulfonation, nitration, Reimer-Tiemann and Kolbe reactions.

Aromatic Aldehydes - Preparation by Gattermann, Gattermann - Koch, Rosenmund and Stephen's method. Reactions - Perkin, Benzoin and Cannizzaro.

Application Oriented Chemistry

Main ingredients, their chemical natures (structures excluded) and their side effects, if any, of common antiseptics, analgesics, antacids, vitamin-C.

Introduction to Bio-Molecules

Carbohydrates - Pentoses and hexoses. Distinctive chemical reactions of glucose.

Aminoacids - glycine, alanine, aspartic acid, cysteine (structures). Zwitterion structures of amino acids, peptide bond.

ADP and ATP - structures and role in bioenergetics; Nucleic acids - DNA and RNA skeleton structures. Names of essential elements in biological system.

Principles of Qualitative Analysis

Detection of water soluble non-interfering Acid and Basic Radicals by dry and wet tests from among: Acid Radicals : Cl⁻, S²⁻, SO₄²⁻, NO₃⁻, CO₃²⁻.

Basic Radicals: Cu²⁺, Al³⁺, Fe³⁺, Fe²⁺, Zn²⁺, Ca²⁺, Mg²⁺, Na⁺, NH₄⁺.

Detection of special elements (N, Cl, Br, I and S) in organic compounds by chemical tests. Identification of functional groups in: phenols, aromatic amines, aldehydes, ketones and carboxylic acids.

BIOLOGICAL SCIENCES

Unit of Life :

Definition of life, Cell as the basic unit of life. Cell theory, Prokaryotic and Eukaryotic cell - structure and differences.

Ultrastructure and functions of cellular components: Cell wall, Plasma membrane, Plastid, Endoplasmic, reticulum, Golgi bodies, Mitochondria, Ribosomes, Lysosomes, Nucleus, Centrosomes, Cilia, Flagella.

Microscopy :

Components and principles of Simple and Compound Microscope;

Electron Microscope :

Basic functional principles.

Physical and chemical principles involved in maintenance of life processes: Diffusion, Osmosis, Absorption, Osmoregulation.

Biomolecules :

Classification and structural properties of carbohydrates, lipids, aminoacids, proteins and nucleic acids.

Carbohydrates :

Monosaccharides, digosaccharides, and polysaccharides (starch, glycogen, cellulose).

Proteins :

Simple (albumins, globulins, collagen) and conjugated proteins (only examples).

Nucleic acids :

Structure of DNA, RNA, types of RNA.

Enzymes :

Definition & properties, Examples; Mechanism of Action, Allosterism and Regulation.

Chromosomes and Cell Division :

Morphology of chromosomes; Euchromatin and Heterochromatin. Nucleic acid as genetic material (Examples: Bacterial Transformation and Viral Transduction).

Brief idea of Polytene chromosomes :

Cell cycle and phases (excluding control mechanism). Characters of malignant cell; Process & significance of Meiosis.

Genetics :

Laws of Heredity (Monohybrid and dihybrid crosses; Mendel's laws). Back cross, Test cross, Linkage, Crossing over, Sex linked inheritance - Colour blindness, Haemophilia.

Mutation - Definition and Types; Replication of DNA, Transcription and Translation (Brief idea).

Origin, Evolution and Diversity of Life :

Haldane and Oparin's concept on origin of life. Modern concept of Natural selection, Biological Species concept. Human evolution - an outline.

Taxonomy and Classification :

Definition; Importance of Taxonomy, Binomial Nomenclature, Law of Priority (Homonym & Synonym).

Concept of Biodiversity :

Definition of Biodiversity; Genetic diversity; Species diversity and Ecosystem diversity. Five kingdom classification (only distinct characters). Salient features of major animal phyla with common examples, classification of Chordates (up to Sub Class) with distinctive characters only.

Population Biology :

Concept of population growth (logistic and exponential) and population control.

Ecosystem :

Concept of ecosystem and Biosphere, Wetland.

Brief idea of Ecological pyramids, Energy flow, Biogeochemical cycle (concept only).

Environmental pollution :

Air, water and noise pollution - sources effects and probable control strategies;

Biomagnification and Bioaccumulation. Cause of Dyslexia, Minamata and Etai etai diseases. Green house effect, BOD, COD, Acid rain and Ozone hole.

Virus and Bacteria :

Morphological characteristics of Bacteriophage (T_2), Plant virus (TMV); Animal virus (influenza), Bacterial cell (E. coli).

Staining :

Gram staining for bacteria.

Biotechnological application of microbes :

1. Agricultural - Rhizobium and other Nitrogen fixing bacteria, Biofertilizers and Bio- pesticides ;
2. Industrial - Production of curd; tanning and brewery; synthesis of antibiotics, vitamin;
3. Cloning of microbial genes.

Tissue and tissue system :

1. Plant Tissues-Meristematic and permanent (types with characterization and function);
2. Animal Tissue - outline classification and examples.

FUNCTIONS OF LIFE

Photosynthesis :

Major photosynthetic pigments, outline concept of light and dark reaction phases, basic idea of bacterial photosynthesis, C_2 , C_3 , C_4 pathways, CAM (in brief), photorespiration.

Respiratory system :

(a) Definition of respiration, Mechanisms of glycolysis, Krebs's cycle (Flow chart only; calculation for ATP, CO_2 & H_2O); Outline idea of Electron Transport system, Relationships of photosynthesis and respiration.

(b) Respiratory system in human : Respiratory tract, Mechanism of breathing, Role of intercostals muscles and diaphragm;

Significance of physiological and anatomical dead space.

Tidal volume, inspiratory and expiratory reserve volumes, residual volume, vital capacity. Composition of inspired, expired and alveolar air. Common respiratory diseases - definition and causes - Asthma, Tuberculosis, Hypoxia, Anoxia, Apnoea, Dyspnoea.

Cardiovascular system & Blood :

Anatomy of Heart - junctional tissues of the heart; origin and propagation of cardiac impulse. Histological structures of arteries, veins and capillaries.

Cardiac cycle - Atrial and ventricular events only; cardiac cycle time, Heart sound. Cardiac output - definition, Stroke and Minutes volume.

Blood pressure :

Factors controlling & measurement.

Blood - Composition and functions of blood.

Blood coagulation and anticoagulants, Blood group and Rh factor, Blood Transfusion, Lymph and tissue fluid formation and functions, Portal circulation.

Nutrition and Digestive system :

Basic constituents of food and their nutritional significance. Vitamins -dietary sources, functions and deficiency symptoms of water and fat soluble vitamins. Structure and functions of the alimentary canal and the digestive glands. Functions of the digestive juices (saliva, gastric juice, pancreatic juice, intestinal juice), biles.

Digestion and absorption of carbohydrates, lipids and proteins. Diseases - Peptic and Gastric ulcers, Gastritis; fasting and obesity.

Metabolism: Definition; B.M.R. - Controlling factors; elementary idea of metabolic pathways; glycogenesis, glycogenolysis, gluconeogenesis, Oxidation of fatty acids, Ketone body formation and its significance.

Deamination, Transamination and Decarboxylation of aminoacids (definition only).

Excretory system :

Histology and function of the nephron (brief idea) Normal and abnormal constituents of urine.

Nervous and Muscular system :

Brief outline of human brain structure.

Cranial nerves :

Distribution and Function. Spinal cord - Structure and major functions, Reflex arc (types) and reflex action: Conditional and unconditional reflexes.

Autonomic: sympathetic and parasympathetic (definition only) nervous system.

Synapse :

Structure and mechanism of synaptic transmission.

Different types of muscles and their structure, properties of muscles :

(i) Excitability; (ii) Contractility; (iii) All or none law; (iv) Refractory period; (v) Summation of stimuli; (vi) Tetanus; (vii) Rigor mortis;

Mechanism of muscle contraction.

Endocrine system and animal hormones :

Definition of endocrine glands and hormones, functions of hormones released from (i) pituitary;

(ii)thyroid; (iii) pancreas; (iv) adrenal; (v) gastrointestinal gland. An outline mechanism of action of protein & steroid hormones.

Causes and symptoms of Acromegaly, Diabetis insipidus, Diabetis mellitus, Goiter, Cushing's disease.

GROWTH, REPRODUCTION, AND AGEING :

In Plants :

Different parts of a typical flower (China rose). Types of flower: regular and irregular, actinomorphic, zygomorphic. Aestivation in Musaceae & Malvaceae. Floral formula: Definition, symbols used in floral formulae in Musaceae (e.g. Banana) and Malvaceae (eg. China rose); Pollination - Definition, self and cross pollination;

Merits and demerits of self and cross pollination. Fertilization - Process of double fertilization. Dispersal of fruits and seeds - Types with examples. Phases and factors of Growth, Differences between growth and development, Abscission senescence, ageing and growth of seeding and the role of gibberellic acid.

In Animals :

Primary and secondary sex organs and secondary sex characters - Testis - Histology, Functions of Testosterone. Spermatogenesis (outline). Ovary - Histology : Functions of estrogen and progesterone;

Oogenesis (outline); structure of mature Graafian follicle.

Menstrual cycle (brief idea). Fertilization and Implantation.

Immunology :

A brief idea of antigen and antibody. Elementary knowledge of inherited, acquired, humoral, cell mediated immunity. Active and passive immunity. Prevention of AIDS and Hepatitis B.

Medical, Agricultural and Economic zoology :

- A.** Outline idea of diseases, their causative organism, mode of infection, symptoms and preventive measures of : (i) Malaria; (ii) Filariasis; (iii) Ascariasis

Distinguishing features of Culex, Anopheles and Aedes. Life cycle and comparative study of Culex and Anopheles. Causative agents of encephalitis and kalaazar and control of their vectors.

- B.** Characteristic features of major and minor carps and examples of exotic carps. Mechanism of induced breeding - hypophysation.

Composite culture of carps, common diseases of carp - Gillrot, fin rot and Dropsy. Definition of pest, Damage symptoms and control of Scirpophaga incertulus and Leptocorisa acuta.

- C.** Poultry - Types of poultry birds; high yielding varieties of poultry birds. Species of honey bees in India and different castes in a colony. Composition and uses of honey.

Chemical composition of silk, types of silk and silk worms. Life cycles of mulberry silk worm. Structure of silk gland. Symptoms of Flacherie, Muscardine, Grassarie and Pebrine.

Application of Biology :

Pesticides and Biological Pest Control - Benefit and hazards, Basic principles of ex situ and in situ conservation. Red Data Book, Green Data Book.

Role of phytohormones in horticulture and agriculture.

Hybridization in plants - Definition and techniques.

Idea about plant cell and tissue culture - Micropropagation.

Principles and application of transgenic plants and animal, Test tube baby.

Biomedical engineering :

Application - ECG & EEG

Imaging - USG, CT Scan, X-ray, MRI

Therapeutic - Pacemaker, Dialyzer.

APPENDIX – II

Guidelines for Filling up Application Form

Sl.	Description of the field	Value	Remarks
1	Candidate's Full Name	Enter Name	Don't use prefixes like Sri/Mr./Ms./Dr. etc.
2	Date of Birth	DD/MM/YYYY	See Section - 6.2 For eligibility condition on Date of Birth
3	Gender	Select	Male <input type="checkbox"/> Female <input type="checkbox"/>
4	Religion	Select	Sikh Minority(S)/ Christian Minority(C)/ Others(O)
5	Application Form for	Select	<input type="checkbox"/> B.Tech <input type="checkbox"/> B.Pharm <input type="checkbox"/> Both
6	State of Domicile of West Bengal	Select	Yes <input type="checkbox"/> No <input type="checkbox"/>
7	Email ID	Type Email ID	Mandatory - to be used for sending messages
8	Telephone Number	Type Number	Start with STD Code - Optional for residential communication
9	Mobile Number	Type Number	Mandatory to be used for sending messages.
10	Father's/ Mother's/ Guardian's Name [As per High School Record]	Enter Name	Don't use prefixes like Sri/Mr./Ms. /Dr. etc.
11	Year of passing (Class / Std. X or equivalent exam.)	Select	Year of Passing
12	Year of passing (Class / Std. XII or equivalent exam.)	Select	Year of Passing

13	Photograph	Paste	Passport size recent colored photograph
14	Signature	Full signature	Black Ink
15	10+2 Results are awaited	Select	Yes <input type="checkbox"/> No <input type="checkbox"/>
16	Choice of Exam Location	Select 1st Choice and Select 2nd Choice	A. 2 Choices to be selected mandatorily from the list of examination locations. Such as : Kolkata(1)/ Durgapur(2)/ Siliguri (3)/ Ranchi(4)/ Patna (5)/ Guwahati (6)
17A	Permanent Address	Type address	Name, Address, PIN Code(6 characters), [Mandatory for correspondence]
17B	Complete mailing address	Type address	Name, Address, PIN Code(6 characters), [Mandatory for correspondence]
18	Have you applied for WBJEEM-2014	Select	Yes <input type="checkbox"/> No <input type="checkbox"/>
19	Have you applied for JEE(Main)-2014	Select	Yes <input type="checkbox"/> No <input type="checkbox"/>
20	Declaration	Date(DD/MM/YYYY), Full Signature	Use Black Ink

APPENDIX – III

Proforma for Residential/Domicile Certificate

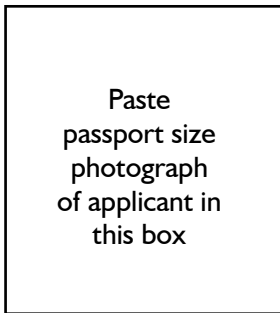
PROFORMA - A-I

Applicable for candidates residing in the State of continuously at least
for last ten (10) years as on 15.12.2013

To be issued by authorized persons other than Head of the Institution from which the candidate
appeared/is due to appear in '10+2' or equivalent examination.

Domicile Certificate : Type-A-I

Certified that
son / daughter of
is a resident/permanent resident of state at Village/House No.....
Street Post Office
Police Station in the district of
under Assembly Constituency and has been living in the
State of continuously / uninterruptedly at least for the last
ten (10) years as on 15-12-2013



Note :

- Photograph is to be attested by the certifying authority.
- Candidates must submit the same photograph, as used in the confirmation page. The same photograph should be used during his/her admission through this system.

Signature of Certifying Authority

Designation with Official Seal

Full Name of Certifying Authority

Address

Phone No. Mobile No.

ID No.

Note : The Certifying Authority may please preserve the duplicate copy of the Certificate in his/her Office provided by the candidate.

Proforma for Residential / Domicile Certificate

PROFORMA - A-II

Applicable for candidates residing in the State of continuously at least for last ten (10) years as on 15.12.2013

To be issued by the Head of the Institution from which the candidate appeared/is due to appear in '10+2' or equivalent examination.

Domicile Certificate : Type - A-II

Certified that
son/daughter of
has passed the '10+2' Examination in the year / will appear in the Final '10+2' Examination in 2014
from this Institution.

It is also certified that the student is a resident/permanent resident of
at Village/House No. Street
Post Office Police Station
in the District of under Assembly Constituency
and has been living in the State of continuously / uninterruptedly at
least for the last ten (10) years as on 15-12-2013.

Paste
passport size
photograph
of applicant in
this box

Note :

- Photograph is to be attested by the certifying authority.
- Candidates must submit the same photograph, as used in the confirmation page. The same photograph should be used during his/her admission through this system.

Signature of Head of the Institution

Designation with Official Seal

Full Name of Certifying Authority

Address

Phone No. Mobile No.

Note : The Certifying Authority may please preserve the duplicate copy of the Certificate in his/her Office provided by the candidate.

Proforma for Residential/Domicile Certificate

PROFORMA - B

Applicable for candidates not residing in the State of but whose parent(s) is/are permanent resident(s) of West Bengal having their permanent home address within the State.
To be issued by authorized persons other than Head of the Institution from which the candidate appeared/is due to appear in '10+2' or equivalent examination.

Domicile Certificate : Type-B

Certified that
Father / Mother of
(the applicant) is permanent resident of West Bengal at Village / House No.
Street.....
Post Office Police Station
in the District of under Assembly Constituency

Paste
passport size
photograph
of applicant in
this box

Paste
passport size
photograph of
Father/Mother
of applicant

Note :

- Photograph is to be attested by the certifying authority.
- Candidates must submit the same photograph, as used in the confirmation page. The same photograph should be used during his/her admission through this system.

Signature of Certifying Authority
Designation with Official Seal
Full Name of Certifying Authority
Address
Phone No. Mobile No.
ID No.

Note : The Certifying Authority may please preserve the duplicate copy of the Certificate in his/her Office provided by the candidate.

APPENDIX – IV

Addresses & Contact Details of the Colleges under AMPAI

SL	COLLEGE NAME	Address	Website
1	JIS College of Engineering, Kalyani, W.B	Block A, Phase III PO. Kalyani Dist. Nadia - 741235,W.B, Phn: 033 2582 2138 li. 033 2580 8640	www.jiscollege.ac.in
2	Narula Institute of Technology, Kolkata	81, Nilgunj Road, Agarpara Kolkata - 700 109 West Bengal +91 33 2563 8888/7777	www.nit.ac.in
3	Guru Nanak Institute of Technology, Kolkata	157/F, Nilgunj Road Panihati Kolkata-700 114, West Bengal +91 33 2523 3900	www.gnit.ac.in
4	Guru Nanak Institute of Pharmaceutical Science & Technology, Kolkata	157/F, Nilgunj Road Panihati Kolkata-700 114 West Bengal +91 33 2523 1247	www.gnipst.ac.in
5	St. Mary's Technical Campus Kolkata	Saibona Village Opp: West Bengal State University, Ichapur Nilgunge Gram Panchayat, Barasat, North 24 Parganas District Kolkata - 700 126 under KMDA 8420247085/ 8498096432	www.stmarysgroup.com

APPLICATION FORM FOR COMMON ENTRANCE EXAMINATION AMPAI - 2014
(FILL IN THE APPLICATION FORM IN BLOCK LETTERS WITH BLACK BALL POINT PEN)

Application Form No.

1. Name of the Candidate:
(As Per High School Records)

2. Date of Birth : DD MM YYYY

3. Gender (put a √ mark): Male Female

4. Religion (put a √ mark) : Sikh Christian Others

5. Application Form for (Put a √ mark) : B.Tech. B.Pharm Both

6. Whether State of Domicile is West Bengal : YES NO

7. E-mail ID:

8. Tel. No. (with STD code) : 9. Mob. No.

10. Father's/Mother's/Guardian's Name :
(As Per High School Records)

11. Year of Passing (Class / Std. 10th or equivalent Exam.)

12. Year of Passing/Appearing (12th or equivalent Exam.)

13.
Paste here one
Stamp Size
Photograph

14. Signature of the Candidate

15. 10+2 Results are Awaited ? (Please put a ✓ mark)

YES

NO

16. Choice of Exam. Centre (Write Centre Code) :

Centre Name	Centre Code
Kolkata	01
Durgapur	02
Siliguri	03
Ranchi	04
Patna	05
Guwahati	06

Ist Choice

2nd Choice

17A. Complete Permanent Address :
(including Pin Code)

Pin:

17B. Complete Mailing Address
(including Pin Code)

Pin:

18. Have you applied for WBJEEM (2014) ?

YES

NO

(Please put a ✓ mark)

19. Have you applied for JEE (Main) 2014 ?

YES

NO

(Please put a ✓ mark)

DECLARATION

I solemnly declare and affirm that all the particulars given above are correct and true to the best of my knowledge and nothing has been concealed therein.

Date

Signature of the Candidate



AMP AI

Association of Minority Professional Academic Institutes

www.ampai.com