

**INFORMATION BROCHURE  
FOR  
WBJEEM-2016**

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**West Bengal Joint Entrance Examinations  
Board  
AQ-13/1, Sector V, Salt Lake City,  
Kolkata 700091**

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## 1. Introduction:

The West Bengal Joint Entrance Examinations Board was formed in the year 1962 for the purpose of holding Common Entrance Examinations for admission to the *Undergraduate Level Engineering Courses in the State of West Bengal*. The endeavour of the Board has always been directed towards enhancement of transparency in conducting Common Entrance Examinations for various professional Undergraduate and Postgraduate level courses in the State through effective state-of-the-art technology. Online application and admission through e-Counselling is operational for the undergraduate level Engineering and Medical courses of the State.

For the 2016–2017 academic session, the Board will conduct the Common Entrance Examination for admission to Undergraduate Courses in Medical, Dental, Engineering & Technology, Pharmacy and Architecture in Universities, Govt. Colleges and Self Financed Institutes in the State. The application for this examination will be received **ONLINE** and the **FORM** will be available at the portal of the Board at <http://www.wbjeeb.nic.in>

The Office of the Board functions from AQ-13/1, Sector-V, Salt Lake City, Kolkata - 700 091.

Phone: (033) 2367 1159/ 1198, email: [wbjeeb@gmail.com](mailto:wbjeeb@gmail.com)

## 2. WBJEEM – 2016:

It is the Common Entrance Examination for admission to different degree level courses in Medical, Dental, Engineering & Technology, Pharmacy and Architecture in Universities, Government Colleges as well as Self Financing Technological Institutes in West Bengal.

3. **Types of examinees:** The “**WBJEEM-2016**” examination will be conducted for 3 (three) types of examinees as listed below. Candidate need to choose the type during online application.

Type	Subjects	Scope
E	Mathematics, Physics + Chemistry	For seeking admission in Engg./ Tech./ Arch. courses or in Pharmacy course in Jadavpur University
M	Biological Sciences, Physics + Chemistry	For seeking admission in Medical/ Dental courses
C	Mathematics, Biological Sciences, Physics + Chemistry	For seeking admission in Engg./ Tech./ Arch courses or Medical/ Dental courses or in Pharmacy course in Jadavpur University

**Note 1:** Candidates not domiciled in West Bengal are not eligible for medical/dental courses. **They can register only as ‘E’ type candidate.** They have to sit for Mathematics and Physics + Chemistry in order to get rank in Engineering/Technology. They may opt to sit only for Physics + Chemistry in order to get admission to Pharmacy colleges other than in Jadavpur University.

**Note 2:** For admission to Pharmacy course: **Jadavpur University:** Candidates have to appear for Mathematics along with Physics & Chemistry as “E” or “C”.

**Note 3:** Candidates appearing only in Physics + Chemistry under any type E or M or C will be eligible only for pharmacy course other than in Jadavpur University.

**Note 4:** Three separate merit lists will be published namely, (i) Engineering (ii) Medical and (iii) Pharmacy.

#### 4. Schedule of Examination “WBJEEM - 2016”:

Date of Examination	Subject	Full Marks	Timing of Examination
17 <sup>th</sup> May, 2016 (Tuesday)	Biological Sciences	(150 marks)	9.00 a.m. to 11.30 a.m. (2 ½ hours)
	Physics + Chemistry	(100 marks)	12.45 p.m. to 2.45 p.m. (2 hours)
	Mathematics	(100 marks)	3.30 p.m. to 5.30 p.m. (2 hours)

No further examination shall be held under any circumstances for those who will be unable to appear on the scheduled date and time of WBJEEM-2016 examination.

#### 5. Question Pattern:

Questions will be based on the syllabus for WBJEEM-2016 as given in **APPENDIX – I**.

In every subject, all questions will be of **Multiple Choice Questions** (MCQ) type, with four options against each of the questions.

Questions will be of three categories as per following table.

Subject	Q Category 1	Q Category 2	Q Category 3	Total No of Questions	Total Marks
Biological Sciences	80x1 mark	25x2 marks	10x2 marks	115	150
Physics +	30x1 mark +	5x2 marks +	5x2 marks +	40 +	50 +
Chemistry	30x1 mark	5x2 marks	5x2 marks	40	50=100
Mathematics	50x1 mark	15x2 marks	10x2 marks	75	100

#### 6. Mode of Answering:

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

*It is to be noted carefully that besides answering the questions, candidates has to fill in as well as bubble in all other relevant information including the “Question Booklet No” etc. at the indicated places on both OMR Answer Sheet and Attendance Sheet during examination.*

#### 7. Scoring Pattern:

##### 7.1. Question Category 1:

7.1.1. Only one option is correct.

7.1.2. Correct option will yield 1 (one) mark

7.1.3. Incorrect option will yield -¼ (negative ¼) marks.

**7.1.4.** For any combination of more than one option, the said answer will be treated as incorrect and will yield  $-\frac{1}{4}$  (negative  $\frac{1}{4}$ ) marks.

**7.2. Question Category 2:**

7.2.1. Only one option is correct.

7.2.2. Correct option will yield 2 (two) mark.

7.2.3. Incorrect option will yield  $-\frac{1}{2}$  (negative  $\frac{1}{2}$ ) marks.

7.2.4. For any combination of more than one option, the said answer will be treated as incorrect and will yield  $-\frac{1}{2}$  (negative  $\frac{1}{2}$ ) marks.

**7.3. Question Category 3:**

7.3.1. One or more options are correct.

7.3.2. Marking all correct options only will yield 2 (two) marks.

7.3.3. For any combination of answers containing one or more incorrect options, the said answer will be treated as incorrect and it will yield zero (0) mark.

7.3.4. For partially correct answers, i.e. when all correct options are not marked and also no incorrect options is marked, marks awarded =  $2 \times (\text{no of correct options marked}) / (\text{total no of actually correct options})$

**8. Ranking and tie breaking:**

In WBJEEM-2016, there will be three separate merit lists: (i) Engineering, (ii) Medical and (iii) Pharmacy (for Pharmacy colleges other than in Jadavpur University).

**8.1. Engineering:** 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:

8.1.1. Less negative marks in Mathematics, Physics and Chemistry taken together

8.1.2. More positive marks in Mathematics and Physics taken together

8.1.3. More positive marks in Mathematics and Chemistry taken together

8.1.4. Less negative marks in Mathematics and Physics taken together

8.1.5. Less negative marks in Mathematics and Chemistry taken together

8.1.6. More positive marks in Mathematics for only the 2 marks questions

8.1.7. More positive marks in Physics for only the 2 marks questions

8.1.8. More positive marks in Chemistry for only the 2 marks questions

8.1.9. Less negative marks in Mathematics for only the 2 marks questions

8.1.10. Less negative marks in Physics for only the 2 marks questions

**8.2. Medical:** Merit list for successful candidates in the **Medical 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.

- 8.2.1. Less negative marks in Biology, Physics and Chemistry taken together
- 8.2.2. More positive marks in Biology and Chemistry taken together
- 8.2.3. More positive marks in Biology and Physics taken together
- 8.2.4. Less negative marks in Biology and Chemistry taken together
- 8.2.5. Less negative marks in Biology and Physics taken together
- 8.2.6. More positive marks in Biology for only the 2 marks questions
- 8.2.7. More positive marks in Chemistry for only the 2 marks questions
- 8.2.8. More positive marks in Physics for only the 2 marks questions
- 8.2.9. Less negative marks in Biology for only the 2 marks questions
- 8.2.10. Less negative marks in Chemistry for only the 2 marks questions
- 8.2.11. Less negative marks in Physics for only the 2 marks questions

**8.3. Pharmacy other than in Jadavpur University:** Merit list for successful candidates For **Pharmacy** other than in Jadavpur University will be prepared by listing them in the descending order of the total marks scored by them in Physics & Chemistry from all types ('E', 'M', 'C'). However, there may be ties and such ties will be broken by sequentially applying the following set of rules:

- 8.3.1. Less negative marks in Physics & Chemistry
- 8.3.2. More positive marks in Chemistry
- 8.3.3. Less negative marks in Chemistry
- 8.3.4. More positive marks in Chemistry for only the 2 marks questions
- 8.3.5. Less negative marks in Chemistry for only the 2 marks questions
- 8.3.6. More positive marks in Physics for only the 2 marks questions
- 8.3.7. Less negative marks in Physics for only the 2 marks questions

**8.4. Pharmacy in Jadavpur University:** For Pharmacy course in Jadavpur University, the merit list of engineering will be considered.

**8.5. Final tie breaker:** If there are still ties even after applying above rules, same will be broken by the date of birth (DOB) of the candidates; the older candidate will be given preference over the younger one.

9. **Eligibility criteria for candidates:** If after examination or admission, or during any stage there of 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 WBJEEM-2016 and secured a position in the Merit List. Permission to appear in WBJEEM-2016 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 to any Engg/Tech, Pharmacy, Architecture, Medical or Dental course unless he/she fulfills all applicable criteria as described below.

**9.1. Citizenship:** Applicant must be a citizen of India.

**9.2. Age Restriction:**

**9.2.1. Engineering / Technology (other than Marine Engineering), Pharmacy and Architecture Courses:** Candidates **must be at least 17** (seventeen) years of age as on 31.12.2016. There is no upper age limit.

**9.2.2. Marine Engineering course:** Candidates **must be at least 17** (seventeen) years of age as on 31.12.2016 and **must not be above 25** (twenty five) years of age as on 31.07.2016.

**9.2.3. Medical/Dental Courses:** Candidates **must be at least 17** (seventeen) years of age as on 31.12.2016. There is no upper age limit.

**9.3. Residential/ Domicile requirement:** The Residential/Domicile requirement for admission to different degree level Medical, Dental, Engineering/Technology, Pharmacy & Architecture courses in West Bengal are listed below:

Type of institute	Category of Seats	Domicile Requirement
State-Aided Universities offering Engineering/ Technology/ Pharmacy /Architecture courses	General category	<b>NO</b>
	Reserved category	<b>YES</b>
Government Engineering & Technology Colleges	General category	<b>YES</b>
	Reserved category	<b>YES</b>
Government Pharmacy Colleges	General category	<b>YES</b>
	Reserved category	<b>YES</b>
Self Financing Universities/Colleges offering Engineering/ Technology/ Pharmacy /Architecture courses	General category	<b>NO</b>
	Reserved category	<b>YES</b>
Medical/Dental Colleges	General category	<b>YES</b>
	Reserved category	<b>YES</b>

**9.3.1. Requirement of domicile certificate:** Candidates seeking admission to (I) Government Engineering/Technology/ Pharmacy Colleges, (II) Medical/Dental Colleges, (III) Reserve category seats of any Institution, including TFW Category Seats must be domicile of West Bengal.

**Only those candidates will be treated as domicile of West Bengal who are either,**

I. Residing in West Bengal continuously at least for last 10 (ten) years as on 31.12.2015 (Applicable domicile certificate proforma A-I or A-II)

OR

II. Whose parent(s) is/are permanent resident(s) of West Bengal having permanent address within the State of West Bengal (Applicable domicile certificate proforma B).

### 9.3.2. Procedure for submission of domicile certificate:

The prescribed Proforma is available in the portal. The proforma as applicable to the candidate has to be downloaded and two copies are to be printed on A4 size white paper.

Get both copies of the Certificate filled in properly and duly authenticated/signed by a competent Authority as per the list provided in Section 9.3.3.

Upload a scanned copy of the filled-in and authenticated Domicile Certificate in document uploading stage of online application.

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

*The candidate must retain the Original Certificate and shall have to produce it at the Reporting Centre during counselling and admission.*

### 9.3.3. Competent authority to issue domicile certificate:

In order to become eligible for admission to any category of seat in Medical/ Dental College and Government Engineering/Technology Colleges OR any reserved category seat in Self financing Institution Residential/Domicile Certificate has to be submitted by the intending candidate in the **Proforma** given in **Appendices VII, VIII & IX** of this Brochure. The applicable **proforma** is to be downloaded and printed on an A4 size white paper and filled in properly.

#### 9.3.3.1. Proforma A-I or 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 (Proforma A-I) or his/her parents (Proforma B), as the case may be, viz.*

- I. District Magistrate, Additional District Magistrate, Deputy Magistrate, Deputy Collector, Sub – Divisional Officer, Block Development Officer.
- II. Superintendent of Police, Additional Superintendent of Police, Sub Divisional Police Officer, Deputy Superintendent of Police,
- III. Commissioner, Additional Commissioner, Joint Commissioner, Deputy Commissioner, Assistant Commissioner of Police Commissionerate.
- IV. Judicial Magistrate of any rank or position in the concerned district or Metropolitan locality or Hon'ble High Court at Calcutta or Hon'ble Supreme Court of India.
- V. Corporation Area - Commissioner, Additional Commissioner, Joint Commissioner, Assistant Commissioner.
- VI. Assistant Secretary or above in the Secretariat to the Government of West Bengal (including GTA) or Central Government.
- VII. Deputy Director or above in the Directorate to the Government of West Bengal or Central Government.

**Every official certifying the Domicile Status of the candidate or his/her parents, MUST provide his/her FULL NAME, DESIGNATION, PLACE OF POSTING WITH ADDRESS, LANDLINE/ MOBILE NUMBER. He/she should also provide his/her IDENTITY CARD NUMBER if available.**



***CERTIFICATION FROM ANY AUTHORITY OTHER THAN WHAT HAVE BEEN ENUMERATED ABOVE 'WILL NOT BE ACCEPTED.'***

***Note: Domicile certificates issued by any elected people's representative such as municipal commissioner, councillor of Municipal Corporation/ Municipality, member of three-tier Panchayat system or GTA, MLA or MP are not acceptable for WBJEEM-2016.***

**9.3.3.2. Proforma A-II:** Domicile certificate in this proforma is to be issued by the Head of the Institution from which the candidate has passed or will appear in 10+2 examination. Such certificate must be issued after verification of the school education record of the candidate.

**Note: Candidates claiming as domicile of West Bengal need to upload any one of the three types of certificates.**

## **10. Academic eligibility criteria:**

### **10.1. For Engineering/Technology courses other than Marine Engineering:**

#### **10.1.1. In Calcutta University (Other than Dept. of Jute & Fibre 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 in regular class mode with:

- a) Individual pass marks in **Physics, Chemistry and Mathematics** as compulsory subjects and
- b) Minimum of 60% marks in the above subjects taken together (55% for SC/ST/ PwD/OBC-A/OBC-B candidates) as well as pass in English with a minimum of 30% marks (for all categories of candidates) in the said qualifying examination.

#### **10.1.2. Dept. of Jute & Fibre Technology, Calcutta University**

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

- a) Individual pass marks in **Physics, Mathematics and Chemistry/Biotechnology/Biology** as compulsory subjects
- b) Minimum of 45% marks in the above subjects taken together (40% for SC/ST/PwD/OBC-A/OBC-B candidates) as well as pass in English with a minimum of 30% marks (for all categories of candidates) in the said qualifying examination.

#### **10.1.3. In Jadavpur University:**

Candidates must pass Higher Secondary (10+2) Examination in General Stream in regular class mode of **West Bengal Council of Higher Secondary Education** or equivalent examination from a recognized Council/ Board with:

- a) Individual pass mark in Physics, Chemistry and Mathematics as compulsory subjects.

- b) Minimum of 60% marks in above subjects taken together (45% for SC/ ST/ PwD candidates) having 60% marks in Mathematics (45% for SC/ ST/ PwD candidates) as well as pass in English with a minimum of 30% (for all categories of candidates) in the said qualifying examination.

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

#### **10.1.4. In other Institutes:**

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

- a) Individual pass marks in **Physics, Chemistry and Mathematics** as compulsory subjects and
- b) Minimum of 45% marks in the above subjects taken together (40% for SC/ST/ PwD/OBC-A/OBC-B candidates) as well as pass in English with a minimum of 30% marks (for all categories of candidates) in the said qualifying examination.

#### **10.2. For Marine Engineering:**

**As per the norms and standards of the Director General of Shipping, Gov. of India:**

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

- a) 60% marks in **Physics, Chemistry and Mathematics** taken together with individual pass marks in the said subjects
- b) Minimum of 50% marks in English as subject in either in '10' or in '10+2' standard.

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

#### **10.3. Architecture Course:**

##### **10.3.1. In Jadavpur University:**

Candidates must pass Higher Secondary (10+2) Examination in General Stream in regular class mode of **West Bengal Council of Higher Secondary Education** or equivalent examination from a recognized Council/ Board with:

- a) Individual pass mark in Physics, Chemistry and Mathematics as compulsory subjects.
- b) Minimum of 60% marks in above subjects taken together (45% for SC/ ST/ PwD candidates) having 60% marks in Mathematics (45% for SC/ ST/ PwD candidates) as well as pass in English with a minimum of 30% (for all categories of candidates) in the said qualifying examination.
- c) Candidate must qualify either in the NATA (National Aptitude Test in Architecture) **conducted by the Council of Architecture, New Delhi** or in Paper 2 of JEE Mains conducted by Central Board of Secondary Education.

Necessary document in the regards is to be produced at the time of counseling.

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

#### 10.3.2. In other institutes:

##### **As per the norms and standards of the Council of Architecture (COA):**

No candidate with less than 50% marks in aggregate shall be admitted to the architecture course unless he/she has passed an examination at the end of new (10+2) scheme of Senior School Certificate Examination or equivalent with Mathematics as a subject of Examination at the 10+2 level.

Candidate must also qualify either in the NATA (National Aptitude Test in Architecture) **conducted by the Council of Architecture, New Delhi** or in Paper 2 of JEE Mains conducted by Central Board of Secondary Education. Necessary document in the regards is to be produced at the time of counseling.

#### 10.4. For Pharmacy Course:

##### 10.4.1. In Jadavpur University

Candidates must pass Higher Secondary (10+2) Examination in General Stream in regular class mode of **West Bengal Council of Higher Secondary Education** or equivalent examination from a recognized Council/ Board with:

- a) Individual pass mark in Physics, Chemistry and Mathematics as compulsory subjects.
- b) Minimum of 60% marks in above subjects taken together (45% for SC/ ST/ PwD candidates) having 60% marks in Mathematics (45% for SC/ ST/ PwD candidates) as well as pass in English with a minimum of 30% (for all categories of candidates) in the said qualifying examination.

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

##### 10.4.2. In other institutes:

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

- a) Individual pass marks in **Physics, Chemistry and Mathematics/ Biotechnology/Biology** as compulsory subjects and
- b) Minimum of 45% marks in the above subjects taken together (40% for SC/ST/ PwD/OBC candidates) as well as pass in English with a minimum of 30% marks (for all categories of candidates) in the said qualifying examination.

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

### 10.5. Medical / Dental Courses:

**As per the norms and standards of the Medical Council of India:**

Candidates must pass Higher Secondary (10+2) Examination of **West Bengal Council of Higher Secondary Education** or equivalent examination recognized by the West Bengal University of Health Sciences in regular mode with:

Individual pass marks in **Physics, Chemistry, Biology and English**.

Minimum of 50% marks in **Physics, Chemistry, Biological Sciences** taken together (40% for SC/ST/OBC-A/OBC-B candidates, 45% for Pwd candidates) and

30% marks in English (for all categories of candidates) in the said qualifying examination.

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

**Admission to seats under "All India Quota":** Candidates will have to apply separately to the Central Board of Secondary Education, New Delhi, subsequent to their notification for the purpose.

**Medical Fitness:** Medical Certificate will have to be produced during counselling from a Registered Medical Practitioner regarding physical and mental fitness as per proforma to be provided at the time of counselling.

### 11. Availability of seats through WBJEEM-2016:

#### 11.1. List of Engineering/Technology /Pharmacy/Architecture/medical/dental Courses and colleges/Universities:

The tentative list of Engineering/Technology, Pharmacy, Architecture courses, as available for admission in the academic session of 2016-17, is given in **APPENDIX-IV**.

The tentative list of Universities, Government Colleges and Self Financed Engineering &Technology Colleges offering Engineering/Technology, Pharmacy, Architecture courses is given in **APPENDIX- V**.

**Note:** Two new Gov. Engineering Colleges are likely to be established in 2016 subject to final approval of AICTE.

The tentative list of different Medical and Dental colleges offering M.B.B.S. and B.D.S. courses is given in **APPENDIX-VI**

Final list will be available in this portal in due time.

#### 11.2. Engg/Tech, Pharmacy and Architecture courses in Universities and Government Colleges:

**11.2.1. State aided Universities / University Departments** except **University Institute of Technology, Burdwan University: 100% seats** shall be available through **WBJEEM-2016**

**11.2.2. University Institute of Technology, Burdwan University: 90% seats** shall be available through **WBJEEM-2016**.

**11.2.3. Self-financed Universities:** Availability of seats through WBJEEM-2016 is decided by the self-financed universities time to time. The final availability will be notified in this portal in due time.

**11.2.4. Government Engineering and Technology Colleges: 100% seats** shall be available for admission through **WBJEEM-2016**.

**11.3. Engg/Tech, Pharmacy and Architecture seats in Private Self Financed Colleges:**

**11.3.1. 80% to 90%** seats shall be available for admission through **WBJEEM-2016**.

**11.3.2. 10% Seats** shall be available for admission through the all India Entrance Examination (i.e. **JEE-Main-2016**).

**11.3.3.** Maximum of **10% seats** shall be available for admission through **Management Quota**, as may be desired by those Institutions.

**11.4. Government Medical/Dental Colleges:**

85% of seats shall be available for admission through **WBJEEM-2016**. Remaining 15% Seats shall be available for admission through All India Medical Entrance Examination.

**11.5. Private Medical/Dental Colleges:**

Availability of seats through WBJEEM-2016 is decided by the self-financed universities time to time. The final availability of seats will be notified in this portal in due time.

**12. Reserved Category Seats:****12.1. SC/ST/OBC-A/OBC-B/PwD:**

In respect of reservation in SC/ST/OBC-A/OBC-B/PwD categories, applicable acts/rules prevailing at the time of admission as briefed below will be followed. **SUCH RESERVATION IS AVAILABLE ONLY TO CANDIDATES DOMICED IN WEST BENGAL.**

<b>Nature of Institution</b>	<b>Applicable Reservation Rules</b>
University / University Departments	Concerned University Act / Rules.
Government Engineering/ Technology /Pharmacy/ Medical/ Dental Colleges	Reservation Rules of Government of West Bengal
Self Financed Engineering / Technology / Pharmacy/ Medical/ Dental Colleges	As notified by concerned Institution Authority.

**List of such reserved seats will be available in this portal before counselling.**

**Candidates seeking reserved seats need to upload SC/ST/OBC-A/OBC-B/PwD certificates issued by competent authority during document uploading stage. Admit card is issued after receipt of the certificate only. But the certificates are checked/verified during counseling. As such, just uploading the certificate does not ensure a reserved seat. If during counseling the certificate is found faulty (where decision of the counselor is final), the candidate can no more claim reservation.**

**12.1.1. SC/ ST Candidates.**

SC/ST certificates are to be issued by the any of the following authorities,

- a) (i) Deputy Collector of Land Revenue, Kolkata ii) Collector of Stamp Revenue, Kolkata iii) Metropolitan Magistrate, Kolkata iv) Additional Chief Metropolitan Magistrate, Kolkata v) Chief Metropolitan Magistrate, Kolkata vi) 1<sup>st</sup> Class Stipendiary Magistrate vii) Executive Magistrate viii) Sub-

divisional Magistrate ix) Sub-divisional Officer x) Deputy Collector xi) Additional District Magistrate xii) Collector and xiii) District Magistrate within their respective local jurisdictions - In case the candidate ordinarily resides within such jurisdictions.

- b) (i) Deputy Director, Backward Classes Welfare Directorate, W.B. (ii) Commissioner, Backward classes welfare W.B. - In case the candidate ordinarily resides in any part of West Bengal.

**THE CERTIFICATE UPLOADED AND SUBMITTED BY THE CANDIDATE FOR CLAIMING RESERVATION UNDER SC/ST QUOTA MUST HAVE BEEN ISSUED BY THE COMPETENT AUTHORITY AS SPECIFIED ABOVE ON A DATE PRIOR TO THE SUBMISSION OF THE ACTUAL ONLINE APPLICATION. CERTIFICATE ISSUED ON A LATER DATE BY ANY AUTHORITY WILL NOT BE ACCEPTED AT THE TIME OF ADMISSION THROUGH COUNSELLING.**

#### **12.1.2. OBC-A/ OBC-B Candidates**

As per Notification no. 374(71)-TW/EC/MR-103/94 dated 27/7/1994, read with memorandum no. 1204-SBCW/MR-67/10 dated 27/7/2015 issued by Backward Classes Welfare Department, Govt. of W.B., the Sub Divisional Officer of a Sub-Division in a District is certificate issuing authority. In Kolkata such certificate is issued by such an officer as the State Government by modification authorizes. Accordingly, the District Welfare Officer, Kolkata and Ex-officio Joint Director, BCW has been notified to act as the certificate issuing authority in respect of Kolkata covering the jurisdiction of the Kolkata Municipal Corporation.

**THE CERTIFICATE UPLOADED AND SUBMITTED BY THE CANDIDATE FOR CLAIMING RESERVATION UNDER OBC-A/ OBC-B QUOTA MUST HAVE BEEN ISSUED BY THE COMPETENT AUTHORITY AS SPECIFIED ABOVE, ON A DATE PRIOR TO THE SUBMISSION OF THE ACTUAL ONLINE APPLICATION. CERTIFICATE ISSUED ON A LATER DATE BY ANY AUTHORITY, WILL NOT BE ACCEPTED AT THE TIME OF ADMISSION THROUGH COUNSELLING.**

#### **12.1.3. PwD (Persons with Disabilities):**

##### **For Admission to B.E/B. Tech/B. Arch/B. Pharm Courses:**

Reservation will be available to candidates with a minimum of 40% disability with respect to Loco-motor disorder, Visual impairment, Speech & Hearing Impairment subject to the condition that the candidate is capable of carrying out all activities related to theory and practical work as applicable to B.E/B. Tech/B. Arch/B. Pharm courses without any special concession and exemption.

##### **For Admission to MBBS/BDS Courses:**

Reservation will be available to candidates with a minimum of 50-70% Loco-motor disability of lower limb only. However, in case any seat in the earmarked quota remains unfilled on account of non-availability of candidates with loco-motor disability between 50% - 70%, any such unfilled seat in the said quota shall be filled up by persons with loco-motor disability of lower limbs between 40% to less than 50%.

**Candidates with disabilities other than loco-motor disability will not be considered for reservation.**

PwD certificates are to be issued by the any of the following authorities,

Officer-in-Charge or Medical Head of Primary Health Centres, Block Primary Health Centres, State General Hospitals, Rural Hospitals, Sub-Divisional Hospitals or the District Hospitals run by the State Government or any hospital run by a statutory body or authority.

**The Medical Board constituted at IPGMR / SSKM Hospital will verify all certificates at the time of counselling.**

### 12.2. Reservation under Minority quota:

In higher Technical Education Institutes, which have been granted the Minority Status (denoted as type 'M' in **APPENDIX V** of the Information Brochure), 50% of the approved seats shall be available for admission through WBJEEM-2016.

However, candidates belonging to Minority Category may choose to get admitted in such minority Institutes as approved by the Government against specified MINORITY QUOTA notified by the State Government of West Bengal.

### 12.3. Reservation of seats for students under Defence Quota:

For consideration under Defence Quota, candidates will have to apply to the Rajya Sainik Board, Home Department, Government of West Bengal, Writers' Buildings, Kolkata – 700 001 through the concerned Zila Sainik Board, W.B. (for ex-servicemen) and Units (for serving soldiers) in the prescribed form with an attested copy of WBJEEM - 2016 Admit Card.

The certificate is not to be uploaded. It's to be produced at the time of offline counselling for defence quota.

**Allotment of seats under Defence Quota is not done through e-counselling.** Based on the recommendation of the said Rajya Sainik Board, a separate Merit List shall be published by the WBJEEM for subsequent offline counselling and allotment of seats.

Altogether 9 (nine) seats in Engg/Tech are reserved for students under Defence Quota. Out of them, 7 (seven) seats are reserved in different courses in Govt. Engineering & Technology Colleges and 2 (two) seats are reserved in Jadavpur University. The courses of such seats in Jadavpur University will be decided by the University Authority.

Name of the Govt. Engg./ Technology College	Course Name	No. of seats
Jalpaiguri Govt. Engineering College	Mechanical Engineering	1
	Information Technology	1
Govt. College of Engg. & Textile Tech., Serampore	Information Technology	1
Govt. College of Engg. & Textile Tech., Berhampore	Computer Science & Engineering	1
Govt. College of Engg. & Ceramic Tech., Kolkata	Information Technology	1
Govt. College of Engg. & Leather Tech., Kolkata	Leather Technology	1
Kalyani Govt. Engineering College, Kalyani	Electrical Engineering	1

**12.4. Reservation of seats in Engg/Tech for students Merit listed in JEE (Mains) 2016:**

Seats are available for students merit listed in **JEE (Mains) 2016 (erstwhile AIEEE)** up to the extent of 10% of the approved seats in all **Self Financed Engineering & Technology Colleges** of West Bengal. Allotment of seats shall be strictly on the basis of merit and preference of students through the e-counselling process conducted by the Board.

The eligibility and other criteria as stipulated for WBJEEM – 2016 candidates for admission to degree level Engineering / Technology / Pharmacy /Architecture courses, will also be applicable for JEE (Mains) 2016 merit listed candidates. **However, such candidates need not be domiciled in West Bengal.**

**12.5. Reservation of seats for admission under Management Quota:**

This is applicable only for Self Financing Colleges of the State offering B.E. /B.Tech./ B. Pharm / B. Arch. Courses. It is also applicable for courses running on self- financing basis under the University Institute of Technology, Burdwan University. However, Institutions may or may not opt for admission of students under such quota.

A Maximum of **10% of sanctioned seats** may be admitted under such management quota directly by the Concerned Management of those Institutions. The eligibility criteria in terms of academic qualification, citizenship, age restrictions, etc. as stipulated for **WBJEEM–2016** candidates for admission to degree level Engineering/Technology, Pharmacy, Architecture courses shall also be applicable for students to be admitted under the Management Quota. **However, such candidates need not be domiciled in West Bengal.**

**13. Application Procedure:**

Application has to be filled up ONLINE at the portal <http://www.wbjeeb.nic.in>.

The candidate need to visit the portal and CLICK the link <**ONLINE APPLICATION WBJEEM – 2016**> and thereafter will be directed to the actual application form. The form is interactive in nature. As soon as the cursor is pointed to a certain field, a cursor tip message will be shown to the candidate to assist in filling up. In case of difficulty, the HELP icon placed right next to the field will redirect the candidate to that section of the Brochure which deals with filling up of the said field. Further, please see **Appendix – III & XII** for detailed guidelines for online form filling.

**The fields super-scribed with \* MUST be filled up as they are MANDATORY, otherwise the application will NOT get submitted.**

There are four steps in application form submission.

**13.1. Online filling of application form:**

Candidates will be required to fill their personal details. After filling all details and successful submission, an Application number will be generated for the candidate's future reference. During form filling, candidate is also required to choose a **PASSWORD** and a security question and answer. Candidate has to remember this question-answer pair for prompt retrieval of password in case it is forgotten at later stage.

**The candidate will need the above Application No. and Password for all subsequent log-in.**

Please note that the applicant name, father's name, mother's name, domicile and date of birth taken together must be unique for each application.

Once an Application Number is generated and the password is chosen, the candidates may logout or continue to upload documents.



**13.2. Document uploading:**

Candidates need to upload the following documents as applicable for different categories (in JPG format) in one session. **Do not send any document to WBJEEB by post.** After uploading all documents candidates may logout or continue to payment page.

Document	Storage size
Recent coloured passport sized photograph	4 to 100 KB
Signature	1 to 30 KB
Left hand thumb impression (LTI)	1 to 30 KB
Admit card/ registration certificate/ mark sheet of 10 <sup>th</sup> standard, where date of birth is mentioned or birth certificate	50 to 300 KB
Domicile certificate	50 to 300 KB
SC/ST/OBC-A/OBC-B certificate	50 to 300 KB
PwD certificate	50 to 300 KB
Income certificate	50 to 300 KB

**Essential features of the photograph:**

- I. The photograph must be in colour taken after 31/12/2015.
- II. It should preferably be taken in a professional studio. Low quality photographs by mobile phones or self composed portraits may result in rejection of application.
- III. Background of the photograph must be of very light colour.
- IV. The face should occupy at least 50% area of the photograph with a full face view looking into the camera directly.
- V. Spectacles of dark or tinted glasses are not permitted.
- VI. Main feature of the face must not be covered by shadow, cloth or hair of the head. Forehead, eyes, nose and chin must be clearly visible.
- VII. The photograph must match with the candidate's appearance at the time of examination.

**On receipt of the documents online, admit card is issued to all those, who are found prima-facie eligible. But the certificates are checked/ verified during counseling. As such, just uploading the certificate does not guarantee a seat. If during counseling any document/ certificate is found faulty (where decision of the counselor is final), the candidate can no more claim a seat.**

**13.3. Application Fee Details:** The candidate will be directed to the page of fee payment and will have following two options:

**13.3.1. Payment by Debit/Credit card:**

The candidate has to select Debit / Credit Card option to pay the fee and follow the instruction to complete the payment process. After successful payment, candidate will be able to print the "Confirmation Page".

**13.3.2. Payment by Allahabad Bank Challan:**

The candidate has to select Allahabad Bank Challan mode to deposit the fee. As soon as he/she selects the option, a challan will be generated containing specific

details of the candidate along with amount (in Rs.) to be paid. The candidate has to take a printout of the same and logout. He/she has to take it to any core banking service (CBS) facility enabled Branch of the Allahabad Bank for making payment. The fee structure is as below:

Type	Fees
E	Rs. 500 + bank's service charges
M	Rs. 500 + bank's service charges
C	Rs. 600 + bank's service charges

Thereafter the "Confirmation Page" will be generated. The candidate can take a print of the confirmation page and logout. Alternately he can save a PDF copy and logout and take the print later. Also he can simply logout and login later to print the confirmation page.

**13.4. Confirmation Page:** Generation of the confirmation Page means that the candidate has been successfully **REGISTERED**. The candidate should take a printout and preserve the confirmation page for future reference.

**13.5. Discrepancy and correction:**

Normally, it is expected that the candidate has filled up all details correctly. But in case of any critical error in date of birth, gender, reservation category, PwD status, TFW status, or in any uploaded document, a window period before issue of admit card will be allowed for the candidate to make corrections. No other data are allowed to be changed by the candidate.

**The candidate need to login to know if there is any discrepancy needing correction. No further change is allowed beyond this stipulated window period.**

**14. Admit Card:**

Admit cards will be generated on the notified date for the student to download and take a print.

Candidate has to carry to the examination centre a printed hard copy of the admit card along with a photograph **identical** with the one uploaded earlier.

**Candidates must ensure that the admit card is not mutilated/ distorted/ soiled even by accident. Candidates with such mutilated/ distorted/ soiled admit cards will not be allowed to appear in WBJEEM-2016.**

Candidates are advised to retain their admit cards carefully in secured place in undamaged condition in all respects till completion of admission procedure.

All applicants who appear to be prima facie eligible will be issued admit cards and shall be provisionally permitted to sit for WBJEEM-2016. If, after scrutiny at any stage, it is found that an applicant is otherwise ineligible, his/her candidature shall be cancelled even if he/she has appeared in WBJEEM-2016 and secured a position in the merit list.

The candidature shall also be cancelled if he/she fails to produce any of the required documents in original as specified earlier or if any document is found to be faulty during counselling/ admission/ registration.

**15. Allocation of examination center:**

Allocation of examination centre will be based on the choices given by the candidate during online form fill-up. However, discretion of the Board in allocation of examination centre shall be final. No request for change of allocated centre will be entertained under any circumstances. List of district-wise examination zones is given in **Appendix-XI**.

- **Candidates from West Bengal, Assam and Tripura must select three zones in order of preference.**
- **Candidates from states other than the above must select Kolkata/Howrah/North 24 Pgs/ South 24 Pgs in order of preference.**

**Any examination zone may be dropped if adequate numbers of candidates are not available.**

**16. Evaluation and Declaration of Results:****A. Scrutiny/review of Answer Sheet:**

The West Bengal Joint Entrance Board takes series of steps to ensure fairness and correctness while framing Multiple Choice Questions and selecting appropriate answers in the examinations. Similarly, various layers of security measures are taken regarding scrutiny of answer sheets.

In view of the above facts and for compressed time lines caused due to unavoidable circumstances, the Board has been constrained to take a considered view that there will be no scope for pre-publication preview or post-publication review of results of WBJEEM-2016. As such, the Board will not be in a position to entertain such requests before or after the result publication this year.

However, the Board will take all possible steps, including best possible supervision and checks to ensure error-free publication of results.

- B. Declaration of results: Results** will be available in the website of the Board, and some other websites which will be announced in various electronic/print media before declaration of results.

**17. Legal Jurisdiction:**

- A. All matters pertaining to conduct of WBJEEM–2016 shall fall within the jurisdiction of Kolkata only.
- B. The Board will not be a party pertaining to any dispute arising in the process of admission to any course of study through WBJEEM – 2016.

**18. Procedure for conduct of Examination:**

Rules to be followed during the conduct of examination are given in **APPENDIX – II and III**.

**19. Counselling and Admission:****19.1 Counselling for Engg/Tech/Pharm/Arch courses:**

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

Codes for the courses in Engineering & Technology along with those for Pharmacy and architecture are listed in **Appendix IV** and the Universities/Institutions in West Bengal offering such courses are listed in **Appendix V**.

Course-wise availability of seats as provided by the competent authority shall be available in this portal before counselling and allotment.

### 19.2 Counselling for Medical/Dental courses:

Subsequent to the WBJEEM-2016 examinations, the West Bengal Joint Entrance Examinations Board will publish the eligible candidates' list and furnish the list to the Directorate of Medical Education, Department of Health & Family Welfare, West Bengal.

Counselling will be done by the Directorate of Medical Education, Department of Health & Family Welfare through online method.

All relevant information regarding Medical and Dental e-counselling will be published in due course in the websites [www.wbhealth.gov.in](http://www.wbhealth.gov.in) and [www.wbmcc.nic.in](http://www.wbmcc.nic.in).

Eligible candidates may contact **Directorate of Medical Education, Department of Health & Family Welfare at Swasthya Bhavan, GN-29, Sector-V, Saltlake, Kolkata-700 091** for any further information.

## 20. Scholarship Schemes:

### 20.1. Tuition Fee Waiver (TFW) Scheme:

The scheme has been implemented by the Govt. of West Bengal for **meritorious and economically backward students domiciled in West Bengal** for admission in to universities / university departments, government colleges and self financing universities/ colleges offering engineering/ technology /pharmacy/ architecture courses.

Selection of candidates for the **TFW** scheme shall be decided on the basis of merit and preference of eligible students in WBJEEM-2016.

The student must be **domiciled in West Bengal** and the domicile certificate has to be uploaded during online application.

Total annual Family Income of the student from **all sources** must be less than **Rs. 2.50 lakhs** (Rupees two lakhs and fifty thousand) only and the income certificate as detailed below has to be uploaded during online application.

The **waiver** is limited to the Tuition Fee only. All other fees will have to be paid by the beneficiary.

### 20.2. Availability of seats under TFW Scheme:

For Universities/University Departments, seats available for admission under TFW scheme shall be as per the decision of the concerned University Authority.

For govt. and self financed Engg/Tech/Pharma colleges, maximum 5% of sanctioned intake per course is available **on supernumerary basis (over and above the sanctioned seats)** for admission under TFW scheme.

In the event of non-availability of students in this category or in-case of any vacancy created due to non-reporting of any candidate, already selected under this scheme, the seats shall not be allotted to any other category of applicants.

### 20.3. Income Certificate:

Candidates must submit the 'Income Certificate' as per the proforma provided in APPENDIX-X of this Information Brochure. Download the same and print in duplicate.

Get two copies certificate filled in properly and duly authenticated/signed by a competent authority as per the list given below.

Upload a scanned copy during online application and retain the original for verification during counseling.

The duplicate copy is to be kept with the issuing authority for future reference/ verification.

**20.4. Competent Authority to issue 'Income Certificate':**

For students from rural region – i) an officer of the State Govt. in the rank of Block Development Officer ii) Sub-Divisional Officer iii) Additional District Magistrate iv) District Magistrate v) Group 'A' Gazetted Officer of State or Central Govt. **of similar rank or above.**

For students from urban region – i) Assistant Commissioner or above in **Municipal Corporation** ii) Group "A" Gazetted Officer of State or **Central Govt. of similar rank** or above

**Note: Income certificate issued by any elected people's representative such as municipal commissioner, councillor of Municipal Corporation/Municipality, member of three-tier Panchayat system or GTA, MLA or MP are not acceptable for WBJEEM, 2016.**

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## APPENDIX –I

### Syllabus for WBJEEM-2016

#### MATHEMATICS:

##### Algebra

A.P., G.P., H.P.: Definitions of A. P. and G.P.; General term; Summation of first n-terms of series  $\sum n$ ,  $\sum n^2$ ,  $\sum n^3$ ; Arithmetic/Geometric series, A.M., G.M. and their relation; Infinite G.P. series and its sum.

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. Solution of quadratic equation in complex number system.

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.

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.

Statistics and Probability:

Measure of dispersion, mean, variance and standard deviation, frequency distribution. Addition and multiplication rules of probability, conditional probability and Bayes' Theorem, independence of events, repeated independent trials and Binomial distribution.

##### Trigonometry

Trigonometric functions, addition and subtraction formulae, formulae involving multiple and submultiple angles, general solution of trigonometric equations. Properties of triangles, inverse trigonometric functions and their properties.

##### Coordinate geometry of two dimensions

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. 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.

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. Equation of tangent, normal and chord. Parametric equation of a circle. Intersection of a line with a circle. Equation of common chord of two intersecting circles.

Definition of conic section, Directrix, Focus and Eccentricity, classification based on eccentricity. Equation of Parabola, Ellipse and Hyperbola in standard form, their foci, directrices, eccentricities and parametric equations.

### **Co-ordinate geometry of three dimensions**

Direction cosines and direction ratios, distance between two points and section formula, equation of a straight line, equation of a plane, distance of a point from a plane.

### **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: Formation of ordinary differential equations, solution of homogeneous differential equations, separation of variables method, linear first order differential equations.

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.

Vectors: Addition of vectors, scalar multiplication, dot and cross products, scalar triple product.

## **PHYSICS:**

**Physical World, Measurements, Units & dimensions:** Physical World, Measurements, Units & dimensions Units & Dimensions of physical quantities, dimensional analysis & its applications, error in measurements, significant figures.

Kinematics: Scalars & vectors, representation of vectors in 3D, dot & cross product & their applications, elementary differential & integral calculus, time-velocity & relevant graphs, equations of motion with uniform acceleration.

Laws of motion: Newton's laws of motion, using algebra & calculus, inertial & non inertial frames, conservation of linear momentum with applications, elastic & inelastic collisions, impulse centripetal force, banking of roads, relative velocity, projectile motion & uniform circular motion Work, power, energy: Work, power, energy Work, work-energy theorem, power, energy, work done by constant & variable forces, PE & KE, conservation of mechanical energy, conservative and nonconservative forces, PE of a spring,

Motion of centre of mass, connected systems, Friction: Centre of mass of two-particle system, motion of connected system, torque, equilibrium of rigid bodies, moments of inertia of simple geometric bodies (2D) [without derivation] conservation of angular momentum, friction and laws of friction.

Gravitation: Kepler's laws, (only statement) universal law of gravitation, acceleration due to gravity ( $g$ ), variation of  $g$ , gravitational potential & PE, escape velocity, orbital velocity of satellites, geostationary orbits.

Bulk properties of matter: Elasticity, Hooke's law, Young's modulus, bulk modulus, shear, rigidity modulus, Poisson's ratio elastic potential energy. Fluid pressure: Pressure due to a fluid column, buoyancy, Pascal's law, effect of gravity on fluid pressure. Surface tension: Surface energy, phenomena involving surface tension, angle of contact, capillary rise,

Viscosity: Coefficient of viscosity, streamline & turbulent motion, Reynold's number, Stoke's law, terminal velocity, Bernoulli's theorem. Heat & Thermal Physics: Heat & temperature, thermal expansion of solids, liquids & gases, ideal gas laws, isothermal & adiabatic processes; anomalous expansion of water & its effects, sp. heat capacity,  $C_p$ ,  $C_v$ , calorimetry; change of state, specific latent heat capacity. Heat transfer; conduction, thermal and thermometric conductivity, convection & radiation, Newton's law of cooling, Stefan's law.

Thermodynamics: Thermal equilibrium (Zeroth law of thermodynamics), heat, work & internal energy. 1st law of thermodynamics, isothermal & adiabatic processes, 2nd law of thermodynamics, reversible & irreversible processes.

Kinetic theory of gases: Equation of state of a perfect gas, kinetic theory of gases, assumptions in Kinetic theory of gases, concept of pressure. & temperature; rms speed of gas molecules; degrees of freedom, law of equipartition of energy (introductory ideas) & application to specific heats of gases; mean free path, Avogadro number.

Oscillations & Waves: Periodic motion – time period, frequency, time-displacement equation, Simple harmonic motion (S.H.M) & its equation; phase; SHM in different systems, restoring force & force constant, energy in S.H.M. - KE & PE, free, forced & damped oscillations (introductory ideas), resonance wave motion, equation for progressive wave, longitudinal & transverse waves, sound waves, Newton's formula & Laplace's correction, factors affecting the velocity of sound in air, principles of superposition of waves, reflection of waves, standing waves in strings & organ pipes, fundamental mode, harmonics & overtones, beats, Doppler effect.

Electrostatics: Conservation of electric charges, Coulomb's law-force between two point charges, forces between multiple charges; superposition principle & continuous charge distribution. Electric field, & potential due to a point charge & distribution of charges, electric field lines electric field due to a dipole; torque on a dipole in uniform electric field; electric flux, Gauss' theorem & its simple applications, conductors & insulators, free charges & bound charges inside a conductor; dielectrics & electric polarisation, capacitors & capacitance, combination of capacitors in series & in parallel, capacitance of a parallel plate capacitor with & without dielectric medium between the plates, energy stored in a capacitor.

Current Electricity:

Electric current, & conductor, drift velocity' mobility & their relation with electric current; Ohm's law, electrical resistance, Ohmic and non-Ohmic conductors, electrical energy & power, carbon resistors, colour codes, combination of resistances, temperature dependence of resistances, electric cell, emf and internal resistance of an electric cell, pd, combination of cells, secondary cells, (introductory) Kirchoff's laws of electrical network, simple applications, principle of Wheatstone bridge, metre bridge and potentiometer and their uses, thermoelectricity; Seebeck effect; Peltier effect, thermo emf.

Magnetic effect of current: Concept of magnetic field, Oersted's experiment, Biot - Savart law & its application to current carrying circular loop; Ampere's law & its applications to infinitely long straight wire, straight and toroidal solenoids; force on a moving charge in uniform magnetic & electric fields, cyclotron frequency; force on a current-carrying conductor in a uniform magnetic field, force between two parallel current-carrying conductors-- definition of ampere. Torque experienced by a current loop in a uniform magnetic field; moving coil galvanometer-its current sensitivity & conversion to ammeter & voltmeter, Inter-conversion of voltmeter & ammeter & change of their ranges.

Magnetics: Current loop as a magnetic dipole & its magnetic dipole moment, magnetic dipole moment of a revolving electron, magnetic field intensity due to a magnetic dipole bar magnet along its axis & perpendicular to its axis, torque on a magnetic dipole (bar magnet) in a uniform magnetic field; magnet as an equivalent solenoid, magnetic field lines; Earth's magnetic field & its magnetic elements. para-, dia- & ferro- magnetic substances, with examples. Electromagnets & the factors affecting their strengths, permanent magnets.

Electromagnetic induction & alternating current: Electromagnetic induction; Faraday's laws, induced emf & current; Lenz's Law, eddy currents, self & mutual induction, alternating currents, peak and rms value of alternating current and voltage; reactance and impedance; LR & CR circuits, phase lag & lead, LCR series circuit, resonance; power in AC circuits, wattless current.



Electromagnetic waves: Electromagnetic waves and their characteristics (qualitative ideas only), transverse nature of electromagnetic waves, electromagnetic spectrum, applications of the waves from the different parts of the spectrum

Optics I (Ray optics): Reflection of light, spherical mirrors, mirror formula. Refraction of light, total internal reflection & its applications, optical fibres, refraction at spherical surfaces, lenses, thin lens formula, lensmaker's formula. Newton's relation: Displacement method to find position of images (conjugate points) Magnification, power of a lens, combination of thin lenses in contact, combination of a lens & a mirror refraction and dispersion of light through a prism; optical instruments, human eye, image formation & accommodation, correction of eye defects (myopia, hypermetropia) using lenses, microscopes & astronomical telescopes (reflecting & refracting) & their magnifying powers.

**Optics II (Wave Optics):** Scattering of light - blue colour of the sky, elementary idea of Raman effect; wave optics: wave front & Huygens' principle, reflection & refraction of plane wave at a plane surface using wave fronts. Proof of laws of reflection & refraction using Huygens' principle Interference, Young's double slit experiment & expression for fringe width, coherent sources, Fraunhofer diffraction due to a single slit,

Particle nature of light & wave particle dualism: Photoelectric effect, Hertz and Lenard's observations; Einstein's photoelectric equation - particle nature of light, matter waves; wave nature of particles, de Broglie relation.

Atomic Physics: Alpha-particle scattering expt Rutherford's nuclear atom model of atom; Bohr model of hydrogen atom, energy levels in a hydrogen atom, hydrogen spectrum, continuous & characteristic xrays.

Nuclear Physics: Composition & size of nucleus, atomic masses, isotopes, isobars; isotones, radioactivity - alpha, beta & gamma particles/ rays & their properties; radioactive decay law; massenergy relation, mass defect; binding energy per nucleon & its variation with mass number; nuclear fission & fusion.

Solid state Electronics: Energy bands in solids (qualitative ideas only), conductors, insulators & semiconductors; semiconductor diode – I-V characteristics in forward & reverse bias, diode as a rectifier;

I-V characteristics of LED, photodiode, solar cell & Zener diode; Zener diode as a voltage regulator, junction transistor (BJT), transistor action, characteristics of a BJT, BJT as an amplifier (CE configuration) & oscillator; logic gates (OR, AND, NOT, NAND & NOR).

## 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, Sommerfeld's 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. Dual nature of matter and light, de Broglie's relationship, Uncertainty principle; The concept of atomic orbitals, shapes of s, p and d orbitals (pictorial approach).

Radioactivity and Nuclear Chemistry:

Radioactivity  $\alpha$ -,  $\beta$ -,  $\gamma$  rays and their properties; Artificial transmutation; Rate of radioactive decay, decay constant, half-life and average age 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); Fajans 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 electronegativity, 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.

Coordination Compounds:

Introduction, Double salts and complex salts, coordination compounds (examples only), Werner's theory, coordination number (examples of coordination number 4 and 6 only), colour, magnetic properties and shapes, IUPAC nomenclature of mononuclear coordination compounds.

Solid State:

Classification of solids based on different binding forces: molecular, ionic, covalent and metallic solids, amorphous and crystalline solids (elementary idea). Unit cell in two dimensional and three dimensional lattices, calculation of density of unit cell, packing in solids, packing efficiency, voids, number of atoms per unit cell in a cubic unit cell, point defects, electrical and magnetic properties. Band theory of metals, conductors, semiconductors and insulators and n & p type semiconductors.

Liquid State:

Vapour pressure, viscosity and surface tension (qualitative idea only, no mathematical derivations).

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. Daltons Law of partial pressure, Grahams Law of gaseous diffusion. Deviations from ideal behavior. Liquefaction of gases, real gases, van der Waals 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 ( $\Delta E$ ) and Enthalpy change ( $\Delta H$ ) in a chemical reaction. Hess's Law and its applications (Numerical problems). Heat of reaction, fusion and vaporization; Second law of thermodynamics; Entropy; Free energy; Criterion of spontaneity. Third law of thermodynamics (brief introduction).

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  $\Delta G$  and  $\Delta G^\ominus$ .

Chemical Dynamics – Factors affecting the rate of chemical reactions (concentration, pressure, temperature, catalyst), Concept of collision theory. 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). Hydrolysis of salts (elementary idea), solubility product, 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 ( $E^\circ$ ), Electrochemical series, feasibility of a redox reaction. Significance of Gibb's equation:  $\Delta G^\circ = -nFE^\circ$  (without derivation), no numerical problems. Redox titrations with (examples); Nernst equations (Numerical problems).

Hydrogen:

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

Chemistry of Non-Metallic Elements and their Compounds:

Carbon – occurrence, isotopes, allotropes (graphite, diamond, fullerene); CO and CO<sub>2</sub> production, properties and uses. Nitrogen and Phosphorus – occurrence, isotopes, allotropes, isolation from natural sources and purification, reactivity of the free elements. Preparation, properties, reactions of NH<sub>3</sub>, PH<sub>3</sub>, NO, NO<sub>2</sub>, HNO<sub>2</sub>, HNO<sub>3</sub>, P<sub>4</sub>O<sub>10</sub>, H<sub>3</sub>PO<sub>3</sub> and H<sub>3</sub>PO<sub>4</sub>.

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).

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), inter-halogen 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. Preparation and properties of K<sub>2</sub>Cr<sub>2</sub>O<sub>7</sub> and KMnO<sub>4</sub>.

Lanthanoids – Electronic configuration, oxidation states, chemical reactivity and lanthanoid contraction and its consequences.

Actinoids – Electronic configuration, oxidation states and comparison with lanthanoids.

Chemistry in Industry:

Large scale production (including physicochemical principles where applicable, omitting technical details) and uses of Sulphuric acid (contact process), Ammonia (Haber's process), Nitric acid (Ostwald's process), sodium bicarbonate and sodium carbonate (Solvey process).

Polymers:

Natural and synthetic polymers, methods of polymerization (addition and condensation), copolymerization, some important polymers – natural and synthetic like polythene, nylonpolyesters, bakelite, rubber. Biodegradable and non-biodegradable polymers.

Surface Chemistry:

Adsorption – physisorption and chemisorption, factors affecting adsorption of gases on solids, catalysis, homogenous and heterogenous activity and selectivity; enzyme catalysis colloidal state distinction between true solutions, colloids and suspension; lyophilic, lyophobic multimolecular and macromolecular colloids; properties of colloids; Tyndall effect, Brownian movement, electrophoresis, coagulation, emulsion – types of emulsions.

Environmental Chemistry:

Common modes of pollution of air, water and soil. Ozone layer, ozone hole – important chemical reactions in the atmosphere, Smog; major atmospheric pollutants; Green House effect; Global warming pollution due to industrial wastes, green chemistry as an alternative tool for reducing pollution, strategies for control of environment pollution.

Chemistry of Carbon Compounds:

Hybridization of carbon:  $\sigma$  – and  $\pi$  – 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  $\beta$ -dicarbonyl compounds, acidity and basicity of simple organic compounds.

Compounds:

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

Alkenes and Alkynes – 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). 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.

Haloalkanes and Haloarenes:

Haloalkanes – Preparation from alcohols; Nomenclature, nature of C -X bond, physical and chemical properties, mechanism of substitution reactions, optical rotation. 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 ). Uses and environmental effects of - dichloromethane, trichloromethane, tetrachloromethane, iodoform, freons, DDT.

Alcohols:

Preparation of alcohols 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<sup>o</sup>, 2<sup>o</sup> and 3<sup>o</sup> amines (Hinsberg method); Reaction with HNO<sub>2</sub>; Carbyl amine reaction.

Aromatic Compounds:

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

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 NO<sub>2</sub>, diazocoupling and reduction.

Haloarenes – Nature of C -X bond, substitution reactions; Nucleophilic substitution, cine substitution (excluding mechanism, Directive influence of halogen in monosubstituted compounds only).

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<sup>-</sup>, S<sub>2</sub><sup>-</sup>, SO<sub>4</sub><sup>2-</sup>, NO<sub>3</sub><sup>-</sup>, CO<sub>3</sub><sup>2-</sup>. Basic Radicals: Cu<sup>2+</sup>, Al<sup>3+</sup>, Fe<sup>3+</sup>, Fe<sup>2+</sup>, Zn<sup>2+</sup>, Ca<sup>2+</sup>, Mg<sup>2+</sup>, Na<sup>+</sup>, NH<sub>4</sub><sup>+</sup>.

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 SCIENCE:**

Science of Life

Basic unit of life process; Cell Theory; prokaryotic and eukaryotic cells- structure and differences

Ultra structure and functions of cellular components

Cell wall, plasma membrane, plastids, endoplasmic reticulum, Golgi bodies, mitochondria, ribosomes, lysosomes, nucleus, nucleolus, centrosome, microbodies (peroxisomes and glyoxysomes), cytoskeleton, vacuole, centriole, cilia, flagella

Chemical constituents of living cells

Classification, components and structural properties of carbohydrates, lipids, proteins and nucleic acids; enzymes, enzymatic action (lock and key, allosterism, regulation)

Chromosome

Morphology of chromosomes; brief idea of polytene chromosomes; euchromatin and heterochromatin; nucleic acids as genetic material (viral transduction and bacterial transformation)

Cell division

Cell cycle; mitosis- definition and significance (process not required); meiosis- process, types and significance; difference between mitosis and meiosis

#### Genetics and Evolution

Mendelian inheritance (laws only); deviations from Mendelism- (i) incomplete dominance, (ii) codominance, (iii) multiple alleles and inheritance of blood groups (ABO, Rh); phylogenetic inheritance (elementary); chromosome theory of inheritance; chromosomes and genes; sex determination in humans, birds and honey bees; linkage and crossing over; sex-linked inheritance- haemophilia, colour blindness; Mendelian disorders in humans- (i) autosomal (a) Thalassaemia (b) Down syndrome; (ii) sex-linked (a) Turner's syndrome (b) Klinefelter's syndrome (cause and symptoms only)

#### Molecular basis of inheritance

DNA as the genetic material (Griffith, Avery-MacLeod-McCarty and Hershey-Chase experiments); structure of DNA and RNA; types of RNA- mRNA, rRNA and t-RNA; DNA packaging; central dogma (elementary); DNA replication; transcription; genetic code; translation; elementary knowledge of regulation of gene expression (lac operon); DNA finger printing (basic idea only)

#### Evolution

Origin of life- theories of origin of life; abiogenic origin/chemical origin of life- Oparin-Haldane hypothesis; biological evolution- evidences, theories of organic evolution, Darwin's contribution, synthetic theory; mechanism of evolution- variation and its sources of origin, mutation, recombination; gene flow and genetic drift; Hardy-Weinberg principle; human evolution- an outline

#### Morphological variations and structural organization

Plant tissue and tissue system- types, structure and functions; animal tissue- classification, structure and functions in brief

#### Physiology and Biochemistry

##### Plants

1. Movements of water, nutrients and gases: absorption of gases, water and nutrients; cell-to-cell transport, diffusion, active transport; plant-water relation- imbibitions, water potential, osmosis and plasmolysis; long distance transport- apoplastic, symplastic, root pressure, transpiration pull, uptake of minerals; transpiration and guttation; opening and closing of stomata; transport through xylem and phloem
2. Essential minerals: macro and micro nutrients and their functions; elementary idea of hydroponics; nitrogen metabolism; nitrogen cycle; biological nitrogen fixation
3. Respiration: cellular respiration- glycolysis, fermentation, TCA cycle and ETS (aerobic)- definition, process and significance; energy relation- number of ATP molecules generated in respiration; amphibolic pathways; respiratory quotients of nutrients
4. Photosynthesis: definition; site of photosynthesis; photosynthetic pigments (structure not required); photochemical and biosynthetic phases; photorespiration; C<sub>3</sub> and C<sub>4</sub> pathways; factors controlling photosynthesis
5. Growth and development: idea of growth, differentiation and development; various growth factors (light, temperature, water, nutrients, hormones only); growth rate; growth regulation- auxin, gibberellins, cytokinin, ethylene, ABA; seed germination, seed dormancy, vernalisation; photoperiodism- definition, types of plants on the basis of the length of photoperiod
6. Reproduction: mode of reproduction- sexual and asexual; asexual reproduction- definition, characteristics, modes (binary fission, sporulation, budding, gemmule formation, fragmentation, regeneration, vegetative propagation, cutting, grafting, layering and gootee); sexual reproduction flower structure; pollination (autogamy and geitonogamy); cross pollination (allogamy and xenogamy); agents of pollination- brief description with examples; significance; development of male gametophyte and female gametophyte; out breeding devices; pollen-pistil interaction, double fertilization; post-fertilization events- development of endosperm and embryo (in brief); formation of fruit and development of seed (elementary); special modes- apomixes, parthenogenesis, parthenocarpy and polyembryony (brief account); significance of fruit and seed formation

## Animals: Human

1. Digestion and absorption: Structure of human alimentary canal including dental arrangement and digestive glands (in brief); peristalsis; digestion, role of digestive enzymes and the Cr-I hormones in digestion; absorption, assimilation of carbohydrates, protein and fats; egestion; nutritional and digestive disorder- protein-energy malnutrition (PEM), indigestion, constipation, vomiting, jaundice, diarrhoea (brief idea)
2. Breathing and respiration: respiratory organs in animals (in brief); respiratory system in human (outline); mechanism of breathing and its regulation in human body; exchange of gases, transport of gases; regulation of respiration; respiratory volume; disorders related to respiration- asthma, emphysema, occupational respiratory disorders (e.g. Silicosis, asbestosis); definition of hypoxia, anoxia, apnoea, dyspnoea
3. Body fluids and circulation: composition of blood (in tabular form); blood grouping; coagulation of blood; lymph and its function; outline idea of human circulatory system; structure of human heart and blood vessels; cardiac cycle, cardiac output, stroke volume, minute volume, determination of cardiac output- Fick's principle; double circulation; regulation of cardiac activity (neural and hormonal) including factors regulating blood pressure; disorders of circulatory system- hypertension, coronary artery disease, angina pectoris, heart failure (brief idea only)
4. Excretory products and their elimination: modes of excretion- ammonotelism, ureotelism, uricotelism (definition and examples); human excretory system- structure and function (histology of nephron); urine formation and osmoregulation; regulation of kidney functions, rennin, angiotensin, antidiuretic factor (ADH) and diabetes insipidus; role of other organs in excretion- liver, skin, lung and salivary glands; disorders- uremia, renal failure, renal calculi, nephritis; dialysis and artificial kidney (brief idea only)
5. Locomotion and movement: types of movement-ciliary, flagellar and muscular; skeletal muscle contractile proteins and its function; joints; disorders of muscular and skeletal system- myasthenia gravis, tetany, muscular dystrophy, arthritis, osteoporosis, and gout (brief idea only)
6. Neural control and coordination: brief idea of neurons and nerves, neural control and coordination; nervous system of human- central, peripheral and visceral; brain and its major parts- cerebral cortex, thalamus, hypothalamus and limbic system; midbrain, pons, medulla, cerebellum and spinal cord (outline idea); distribution and function of peripheral nervous system and autonomic nervous system; generation and conduction of nerve impulse; reflex action and reflex arc; sense organs- sensory perception; outline structure and function of eye and ear
7. Chemical coordination and regulation: endocrine glands and hormones; human endocrine system- hypothalamus, pituitary, pineal, thyroid, parathyroid, adrenal, pancreas, gonads- location and function only; elementary idea of hormone action, role of hormones as messengers and regulators; hypo- and hyperactivity of endocrine glands and related diseases- dwarfism, acromegaly, cretinism, goitre, exophthalmic goitre, diabetes, Addison's disease (brief idea of cause and symptoms only)
8. Reproduction: male and female reproductive system (outline idea with diagram); microscopic anatomy of testis and ovary; gametogenesis (brief account); menstrual cycle; fertilization and development of embryo up to blastocyst formation; implantation, pregnancy and placenta formation; elementary idea of parturition and lactation

## Taxonomy, Systematics and Biodiversity

Definition; binomial nomenclature; Law of priority; need for classification; genetic diversity; species diversity, ecosystem diversity, biodiversity; five kingdom classification; salient features and classification of plants and animals

## Ecology and Environment

Concept of ecology, ecosystem, environment, habitat and niche; biome concept and distribution; major abiotic factors; response to abiotic factors and adaptation; population interaction- mutualism, competition, predation, parasitism; population attributes- growth, birth rate and death rate; trophic relationship, pyramids of number, biomass and energy; ecological succession

### Biodiversity and Conservation

Pattern of biodiversity; importance and loss of biodiversity; need of biodiversity conservation; hotspot; endangered species; extinction; Red Data Book and Green Data Book; biodiversity conservation biosphere reserve, national parks and sanctuaries (general idea)

### Environmental issues

Sound, air, water pollution and their control; agrochemical and their effects; green house effect and global warming; ozone depletion; deforestation; idea of success stories addressing environmental issues- 1) Chipko Movement, 2) Dasholi Gram Swarajya Mandal Movement (DGSM), Silent Valley or Amrita Devi Bishnoi Movement (Jaipur); concept and biomagnifications and bioaccumulation; cause of dyslexia, Minamata and itai-itai diseases; idea of BOD, COD, acid rain, ozone hole

### Microbes and human welfare

Morphological characteristics of bacteriophage (T2), plant virus (TMV), animal virus (influenza) and bacteria (E. coli), gram negative and gram positive bacteria (characteristics and examples)

### Health and diseases

Concept of immune system, antibody, antigen and its reactions; types of immunity, vaccine and vaccination (brief idea); pathogens and parasites causing human diseases (only causative agents, symptoms of diseases, modes of transmission and preventive measures)- malaria, kala azar, amoebiasis, filariasis, ascariasis, typhoid, pneumonia, common cold, ring worm, HIV, AIDS, cancer

### Biotechnology and its applications

Principle and process of genetic engineering (recombinant DNA technology); cloning of microbial genes (brief idea only); application of biotechnology in health and agriculture- in household food processing; industrial production, energy generation, sewage treatment; Rhizobium and other nitrogen fixing bacteria, biofertilizers and biopesticides, industrial production of curd; tanning and brewery, synthesis of antibiotics, vitamins, human insulin and vaccine production; gene therapy, transgenesis, transgenic animals and plants with examples (including BT cotton)



## APPENDIX –II

### Rules of the Examination

1. The Examination Hall will be opened 15 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.
2. Candidate must bring with them **i) Downloaded Admit Card of WBJEEM-2016, ii) One copy of photograph, same as the one uploaded; iii) Black / Blue Ball Point Pen.**
3. Candidates must show on demand the Admit Card (WBJEEM-2016) for admission to the Examination Hall. A candidate not possessing print out of the downloaded admit card along with the photograph shall not be allowed to enter in the Examination Hall by the Center-in-Charge.
4. A seat indicating Roll No. will be allocated to each candidate. Candidates must occupy their allocated seat.
5. **Candidates are not allowed to carry any textual material, printed or written, bits of papers or any other material except those listed above in sl. No.2 inside examination Hall.**
6. **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.**
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 to the invigilator on duty; this may otherwise lead to cancellation of his/her paper.
8. It is to be noted carefully that the candidates must write the "Question Booklet No." 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.
9. Candidates shall maintain silence during the examination. Any conversation or gesticulation or disturbance in the examination hall shall be deemed as misdemeanour. 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.
10. **If a candidate is found impersonating, his/her candidature will be cancelled outright and the concerned examinee will be handed over to the Police.**

### **APPENDIX – III**

#### **DOS AND DONTs**

#### **Dos**

1. Read the online instructions carefully before filling-in of the Application Form online.
2. Specify all personal information, address and date of birth correctly.
3. Remember your application number, security question/answer and password.
4. Choose the District and examination zones correctly.
5. Upload colour photograph, left thumb impression and signature with specified size only
6. Retain a copy of the Confirmation Page.
7. Enter the examination hall only with your Admit Card, one photograph and blue/black ball point pens.
8. Submit the OMR Answer Sheet to the Invigilator after completion of each session of Examination.
9. Write the Question Booklet No. in specified places on both the OMR Answer Sheet and Attendance Sheet.

#### **Don'ts**

1. Don't divulge your application number, security question/answer and password to anybody.
2. Don't give wrong/unused mobile number during form fill up.
3. Don't upload poorly scanned photograph and thumb impression.
4. Don't sign in capital letters, sign your full signature and upload as per specifications.
5. Don't claim any credentials/reservation for which supporting documents are not available.
6. Don't send any document to WBJEEB.
7. Don't spoil hard copy of your downloaded admit card.
8. Don't bring Mobile Phone, Calculator or any other electronic gadget inside the Examination Hall.

**APPENDIX –IV**  
**COURSES AND COURSE CODES**

Sl.No	Course Name	Course Code
1	Agricultural Engineering	AGR
2	Apparel Production Management	APM
3	Applied Electronics & Instrumentation Engineering / Electronics & Instrumentation Engineering/Instrumentation & Electronics Engg.	EIE
4	Architecture	ARC
5	Automobile Engineering	ATE
6	Bio Medical Engineering	BMD
7	Bio Technology	BOT
8	Ceramic Engineering/Technology	CRM
9	Chemical Engineering	CHE
10	Chemical Technology	CHT
11	Civil Engineering	CIV
12	Civil and Environmental Engineering	CEE
13	Computer Science & Engineering Technology / Computer Science & Technology	CSE
14	Construction Engineering	COE
15	Dairy Technology	DAT
16	Electrical & Electronics Engineering	EEE
17	Electrical Engineering	ELE
18	Electronics & Comm. Engineering/Electronics & Telecomm. Engineering	ECE
19	Food Technology	FET
20	Information Technology	INT
21	Instrumentation Engineering	INE
22	Instrumentation and Control Engineering	ICE
23	Jute & Fibre Technology	JFT
24	Leather Technology	LET
25	Marine Engineering	MRE
26	Mechanical Engineering	MEC
27	Metallurgical Engineering	MET
28	Optics and Optoelectronics	OOE
29	Pharmaceutical Engineering / Pharmaceutical Technology	PHE
30	Power Engineering	PWE
31	Polymer Science & Technology	PST
32	Printing Engineering / Printing Technology	PRT
33	Production Engineering	PRO
34	Textile Engineering / Textile Technology	TEX

**Updated (if any) list will be available before counseling.**

**APPENDIX – V****List of Universities & Colleges offering Engineering/Technology, Pharmacy & Architecture Courses.**

**Legend:**        **U – University/University Department,**  
                       **G – Govt. College,**  
                       **PU - Private (Self Financing) University**  
                       **P – Private (Self Financing) College,**  
                       **M – Minority Institutes**

<b>Sl. No.</b>	<b>Institute Name</b>	<b>Available courses (Tentative)</b>	<b>Institute Type</b>
1.	BIDHAN CHANDRA KRISHI VISWAVIDYALAYA,KALYANI	AGR	U
2.	JADAVPUR UNIVERSITY, KOLKATA	ARC, CHE, CIV, CSE, COE, ECE, ELE, FET, INT, EIE, MEC, MET, PWE, PRO, PRT	U
3.	MAULANA ABUL KALAM AZAD UNIVERSITY OF TECHNOLOGY, SALT LAKE	CSE, INT	U
4.	UNIVERSITY INSTITUTE OF TECHNOLOGY, BURDWAN UNIVERSITY, BURDWAN (Self Financing Courses)	EIE, CIV, CSE, ECE, ELE, INT	U
5.	UNIVERSITY OF CALCUTTA	JFT, CHE, CHT, CSE, ECE, ELE, INT, INE, OOE, PST	U
6.	UNIVERSITY OF KALYANI – SCIENCE INSTRUMENTATION CENTRE, KALYANI	EIE, INT	U
7.	UTTAR BANGA KRISHI VISWAVIDYALAYA,COOCHBEHAR	AGR	U
8.	WEST BENGAL UNIVERSITY OF ANIMAL AND FISHERY SCIENCES	DAT	U
9.	GOVERNMENT COLLEGE OF ENGINEERING AND LEATHER TECHNOLOGY, SALT LAKE	CSE, INT, LET	G
10.	GOVT. COLLEGE OF ENGG. & TEXTILE TECHNOLOGY-BERHAMPUR	CSE, ELE, MEC, TEX	G
11.	GOVT. COLLEGE OF ENGINEERING & CERAMIC TECHNOLOGY, KOLKATA	CRM, CSE, INT	G
12.	GOVT. COLLEGE OF ENGINEERING & TEXTILE TECHNOLOGY-SERAMPUR	APM, CSE, INT, TEX	G
13.	INSTITUTE OF PHARMACY, JALPAIGURI	PHE	G
14.	JALPAIGURI GOVERNMENT ENGINEERING COLLEGE	CIV, CSE, ECE, ELE, INT, MEC	G
15.	KALYANI GOVERNMENT ENGINEERING COLLEGE	CSE, ECE, ELE, INT, MEC	G
16.	COOCHBEHAR GOVERNMENT ENGINEERING COLLEGE	CIV, ECE, ELE, CSE, MEC	G
17.	PURULIA GOVERNMENT ENGINEERING COLLEGE	CIV, ECE, ELE, CSE, MEC	G
18.	SEACOM SKILLS UNIVERSITY, BOLPUR	CIV, CSE, ELE, MEC	PU
19.	TECHNO INDIA UNIVERSITY, SALT LAKE	BOT, CIV, CSE, ECE, ELE	PU
20.	UNIVERSITY OF ENGINEERING AND MANAGEMENT, RAJARHAT	CSE, ECE, EEE, EIE, ELE	PU
21.	ABACUS INSTITUTE OF ENGINEERING & MANAGEMENT,MOGRA,HOOGLY	EIE, CSE, ECE, ELE, INT	P
22.	ACADEMY OF TECHNOLOGY,BANDEL,HOOGLY	EIE, CSE, ECE, ELE, INT, MEC	P
23.	ADMAS INSTITUTE OF TECHNOLOGY,BARASAT	CIV, CSE, ECE, ELE, INT, MEC	P
24.	ARYABHATTA INSTITUTE OF ENGINEERING & MANAGEMENT,PANAGARH,BURDWAN	CIV, CSE, ECE, ELE, EEE, INT, MEC	P

25.	ASANSOL ENGINEERING COLLEGE,ASANSOLE	EIE, CIV, CSE, ECE, ELE, INT, MEC	P
26.	B.P. PODDAR INSTITUTE OF MANAGEMENT & TECHNOLOGY, VIP ROAD, KOLKATA	CSE, ECE, ELE, INT	P
27.	BANKURA UNNAYANI INSTITUTE OF ENGINEERING	EIE, CIV, CSE, ECE, ELE, INT, MEC	P
28.	BATANAGAR INSTITUTE OF ENGINEERING, MANAGEMENT & SCIENCE, BATANAGAR	CIV, CSE, ECE, ELE, MEC	P
29.	BCDA COLLEGE OF PHARMACY & TECHNOLOGY, HRIDAYPUR, BARASAT	PHE	P
30.	BENGAL COLLEGE OF ENGINEERING & TECHNOLOGY FOR WOMEN, DURGAPUR	CSE, ECE, ELE, EEE, INT	P
31.	BENGAL COLLEGE OF ENGINEERING & TECHNOLOGY, DURGAPUR	EIE, BOT, CIV, CSE, ECE, ELE, EEE, INT, MEC	P
32.	BENGAL COLLEGE OF PHARMACEUTICAL SCIENCE & RESEARCH, DURGAPUR	PHE	P
33.	BENGAL INSTITUTE OF TECHNOLOGY & MANAGEMENT, SHANTINIKETAN, BIRBHUM	EIE, CIV, CSE, ECE, ELE, INT, MEC	P
34.	BENGAL INSTITUTE OF TECHNOLOGY, BANTALA, KOLKATA	BOT, CSE, ECE, INT	P
35.	BENGAL SCHOOL OF TECHNOLOGY, CHINSURA, HOOGHLY	PHE	P
36.	BHARAT TECHNOLOGY, ULUBERIA, HOWRAH	PHE	P
37.	BIRBHUM INSTITUTE OF ENGINEERING & TECHNOLOGY, SURI	CIV, CSE, ECE, ELE, INT, MEC	P
38.	BRAINWARE GROUP OF INSTITUTIONS, BARASAT	CIV, CSE, ECE, ELE, INT, MEC	P
39.	BUDGE BUDGE INSTITUTE OF TECHNOLOGY, BUDGE BUDGE	CIV, CSE, ECE, ELE, MEC	P
40.	CALCUTTA INSTITUTE OF ENGINEERING & MANAGEMENT, TALLYGUNJ, KOLKATA	CIV, CSE, ECE, ELE, ICE, INT	P
41.	CALCUTTA INSTITUTE OF PHARMACEUTICAL TECH. AND ALLIED HEALTH SCIENCES, ULUBERIA, HOWRAH	PHE	P
42.	CALCUTTA INSTITUTE OF TECHNOLOGY, ULUBERIA, HOWRAH	CHE, CIV, CSE, ECE, ELE, MEC	P
43.	CAMELIA INSTITUTE OF ENGINEERING & TECHNOLOGY, BUD BUD, BURDWAN	CIV, CSE, ECE, ELE, MEC	P
44.	CAMELIA INSTITUTE OF TECHNOLOGY & MANAGEMENT, BAINCHI, HOOGHLY	CIV, CSE, ECE, ELE, MEC	P
45.	CAMELIA INSTITUTE OF TECHNOLOGY, BADU ROAD, MADHYAMGRAM, 24-PGS-NORTH	EIE, CIV, CSE, ECE, ELE, EEE, INT, MEC	P
46.	CAMELIA SCHOOL OF ENGINEERING & TECHNOLOGY, BARASAT, 24-PGS-NORTH	CIV, CSE, ECE, ELE, EEE, INT, MEC	P
47.	COLLEGE OF ENGINEERING AND MANAGEMENT, KOLAGHAT, EAST MIDNAPUR	EIE, CSE, ECE, ELE, INT, MEC	P
48.	DR. B. C. ROY COLLEGE OF PHARMACY AND ALLIED HEALTH SCIENCES, DURGAPUR	PHE	P
49.	DR. B. C. ROY ENGINEERING COLLEGE, DURGAPUR	EIE, CIV, CSE, ECE, ELE, INT, MEC	P
50.	DR. SUDHIR CHANDRA SUR DEGREE ENGINEERING COLLEGE, DUM DUM, KOLKATA	ATE, CIV, CSE, ECE, ELE, MEC	P
51.	DREAM INSTITUTE OF TECHNOLOGY, NAHAZARI, 24-PGS-SOUTH	EIE, CSE, ECE, ELE, MEC	P
52.	DUMKAL INSTITUTE OF ENGINEERING & TECHNOLOGY, DUMKAL, MURSHIDABAD	EIE, CIV, CSE, ECE, ELE, INT, MEC	P

53.	DURGAPUR INSTITUTE OF ADVANCED TECHNOLOGY & MANAGEMENT,PANAGARH	CHE, CSE, ECE, ELE, INT, MEC	P
54.	ELITTE COLLEGE OF ENGINEERING, MOHISPOTA, SODEPUR	CIV, CSE, ELE, MEC	P
55.	FUTURE INSTITUTE OF ENGINEERING & MANAGEMENT,SONARPUR, KOLKATA	EIE, CSE, ECE, ELE, INT, MEC	P
56.	FUTURE INSTITUTE OF TECHNOLOGY, BORAL, GARIA	CIV, CSE, ECE, ELE, MEC	P
57.	GARGI MEMORIAL INSTITUTE OF TECHNOLOGY, BARUIPUR, 24-PGS-SOUTH	CIV, CSE, ECE, ELE, MEC	P
58.	GLOBAL INSTITUTE OF MANAGEMENT AND TECHNOLOGY, KRISHNANAGAR,NADIA	CIV, CSE, ECE, ELE, MEC	P
59.	GREATER KOLKATA COLLEGE OF ENGINEERING & MANAGEMENT, BARUIPUR, 24-PGS-SOUTH	EIE, CSE, ECE, ELE, INT	P
60.	GUPTA COLLEGE OF TECHNOLOGICAL SCIENCE	PHE	P
61.	HALDIA INSTITUTE OF TECHNOLOGY, EAST MIDNAPUR	EIE, BOT, CHE, CIV, CSE, ECE, ELE, FET, INT, ICE, MEC, PRO	P
62.	HEMNALINI MEMORIAL COLLEGE OF ENGINEERING,HARINGHATA, NADIA	CEE, CIV, MEC, FET, CSE	P
63.	HERITAGE INSTITUTE OF TECHNOLOGY,KOLKATA	EIE, BOT, CHE, CIV, CSE, ECE, ELE, INT, MEC	P
64.	HOOGHLY ENGINEERING & TECHNOLOGY COLLEGE, HOOGHLY	CIV, CSE, ECE, ELE, MEC	P
65.	IDEAL INSTITUTE OF ENGINEERING,KALYANI,NADIA	CIV, CSE, ECE, ELE, MEC	P
66.	IMPS COLLEGE OF ENGINEERING & TECHNOLOGY, MALDA	CIV, CSE, ECE, ELE, INT	P
67.	INSTITUTE OF ENGINEERING & MANAGEMENT, SALT LAKE	CSE, ECE, ELE, INT, MEC	P
68.	INSTITUTE OF SCIENCE AND TECHNOLOGY, CHANDRAKONA, WEST MIDNAPUR	CIV, CSE, ECE, ELE, EEE, MEC	P
69.	JLD ENGINEERING AND MANAGEMENT COLLEGE, BARUIPUR	CSE, ECE	P
70.	KANAD INSTITUTE OF ENGINEERING & MANAGEMENT, MANKAR, BURDWAN	CIV, CSE, ECE, ELE, EEE, INT, MEC	P
71.	MALLABHUM INSTITUTE OF TECHNOLOGY, BISHNUPUR, BANKURA	CIV, CSE, ECE, ELE, MEC	P
72.	MCKV INSTITUTE OF ENGINEERING, LILUAH, HOWRAH	ATE, CSE, ECE, ELE, INT, MEC	P
73.	MEGHNAD SAHA INSTITUTE OF TECHNOLOGY, KOLKATA	CIV, CSE, ECE, ELE, INT, MEC	P
74.	MODERN INSTITUTE OF ENGINEERING & TECHNOLOGY, BANDEL, HOOGHLY	EIE, CIV, CSE, ECE, ELE, MEC	P
75.	MURSHIDABAD COLLEGE OF ENGINEERING & TECHNOLOGY, MURSHIDABAD	CIV, CSE, ECE, ELE, INT	P
76.	N.S.H.M. COLLEGE OF PHARMACEUTICAL TECHNOLOGY, TOLLYGUNJ, KOLKATA	PHE	P
77.	NATIONAL POWER TRAINING INSTITUTE-DURGAPUR UNDER MINISTRY OF POWER, GOVT. OF INDIA – SELF FINANCING	PWE	P
78.	NEOTIA INSTITUTE OF TECHNOLOGY MANAGEMENT & SCIENCES,D.H.ROAD,24-PGS(S)	BOT, CSE, ECE, EEE, INT, MEC, MRE	P
79.	NETAJI SUBHAS ENGINEERING COLLEGE, GARIA, KOLKATA	EIE, BME, CIV, CSE, ECE, ELE, INT, MEC	P

80.	NETAJI SUBHASH CHANDRA BOSE INSTITUTE OF PHARMACY, CHAKDAH, NADIA	PHE	P
81.	NSHM KNOWLEDGE CAMPUS, DURGAPUR	CIV, CSE, ECE, EEE, MEC	P
82.	OM DAYAL GROUP OF INSTITUTIONS, ULUBERIA, HOWRAH	ARC, CIV, CSE, ECE, MEC	P
83.	PAILAN COLLEGE OF MANAGEMENT & TECHNOLOGY, JOKA, 24-PGS-SOUTH	CSE, ECE, EEE, INT	P
84.	RCC INSTITUTE OF INFORMATION TECHNOLOGY, BELEGHATA, KOLKATA	EIE, CSE, ECE, ELE, INT	P
85.	REGENT EDUCATION AND RESEARCH FOUNDATION, TITAGARH, 24-PGS-NORTH	CIV, CSE, ECE, ELE, EEE	P
86.	SANAKA EDUCATION TRUSTS GROUP OF INSTITUTIONS, KANKSHA, BURDWAN	ARC, CIV, CSE, ECE, ELE, EEE, MEC	P
87.	SAROJ MOHAN INSTITUTE OF TECHNOLOGY, GUPTIPARA, HOOGHLY	EIE, CSE, ECE, ELE, INT, MEC	P
88.	SEACOM ENGINEERING COLLEGE, SANKRAIL, HOWRAH	CIV, CSE, ECE, ELE, INT, MEC, MRE	P
89.	SILIGURI INSTITUTE OF TECHNOLOGY, SILIGURI	EIE, CIV, CSE, ECE, ELE, INT	P
90.	ST. THOMAS COLLEGE OF ENGINEERING & TECHNOLOGY, KHIDIRPUR, KOLKATA	CSE, ECE, ELE, INT	P
91.	SUPREME KNOWLEDGE FOUNDATION GROUP OF INSTITUTIONS, MANKUNDU, HOOGHLY	EIE, CIV, CSE, ECE, ELE, MEC	P
92.	SURENDRA INSTITUTE OF ENGINEERING & MANAGEMENT, SILIGURI	CIV, CSE, ECE, ELE, MEC	P
93.	SWAMI VIVEKANANDA INSTITUTE OF SCIENCE & TECHNOLOGY, SONARPUR, 24-PGS-SOUTH	CSE, ECE, ELE, MEC	P
94.	TECHNI INDIA, DURGAPUR, KANKSA, PANAGAR	CIV, CSE, ECE, ELE, INT, MEC	P
95.	TECHNO GLOBAL-BALURGHAT, SOUTH DINAJPUR	CIV, CSE, ECE, ELE, INT	P
96.	TECHNO INDIA COLLEGE OF TECHNOLOGY, RAJARHAT, SALT LAKE	EIE, CIV, CSE, ECE, ELE, INT, MEC	P
97.	TECHNO INDIA, SALT LAKE	EIE, CIV, CSE, ECE, ELE, FET, INT, MEC	P
98.	TECHNO INDIA-BANIPUR, 24-PGS-NORTH	EIE, CSE, ECE, EEE, INT	P
99.	GURU NANAK INSTITUTE OF TECHNOLOGY, PANIHATI, 24-PGS-NORTH	EIE, CSE, ECE, ELE, FET, INT	P, M
100.	JIS COLLEGE OF ENGINEERING, KALYANI	EIE, BME, CIV, CSE, ECE, ELE, INT, MEC	P, M
101.	NARULA INSTITUTE OF TECHNOLOGY, AGARPARA, 24-PGS-NORTH	EIE, CIV, CSE, ECE, ELE, INT	P, M
102.	ST. MARYS TECHNICAL CAMPUS, BARASAT, 24-PGS-NORTH	CIV, CSE, ECE, EEE, MEC	P, M
103.	GURU NANAK INSTITUTE OF PHARMACEUTICAL SCIENCE AND TECHNOLOGY, PANIHATI, 24-PGS-NORTH	PHE	P, M

**Updated (if any) list will be available before counseling**

**APPENDIX – VI****List of Colleges offering M.B.B.S / B.D.S Courses**

<b>Sl. No.</b>	<b>Institute Name</b>	<b>Institute Type</b>
1	MEDICAL COLLEGE & HOSPITAL, KOLKATA	G
2	N.R.S. MEDICAL COLLEGE, KOLKATA	G
3	R.G. KAR MEDICAL COLLEGE, KOLKATA	G
4	CALCUTTA NATIONAL MEDICAL COLLEGE, KOLKATA	G
5	BANKURA SAMMILANI MEDICAL COLLEGE, BANKURA	G
6	BURDWAN MEDICAL COLLEGE, BURDWAN	G
7	NORTH BENGAL MEDICAL COLLEGE, DARJEELING	G
8	I.P.G.M.E.R., KOLKATA	G
9	MIDNAPUR MEDICAL COLLEGE, PASCHIM MEDINIPUR	G
10	MALDAH MEDICAL COLLEGE, MALDAH	G
11	MURSHIDABAD MEDICAL COLLEGE & HOSPITAL	G
12	COLLEGE OF MEDICINE & SAGAR DUTTA HOSPITAL, KOLKATA	G
13	ESI PGIMSR, JOKA, KOLKATA	G <sup>#</sup>
14	COLLEGE OF MEDICINE AND J.N. MEMORIAL HOSPITAL, KALYANI, NADIA	G
15	K.P.C. MEDICAL COLLEGE & HOSPITAL, KOLKATA	P
16	IQ CITY MEDICAL COLLEGE & NH HOSPITAL, DURGAPUR	P
17	I CARE MEDICAL COLLEGE & HOSPITAL, HALDIA	P
18	DR. R. AHMAD DENTAL COLLEGE, KOLKATA	G
19	NORTH BENGAL DENTAL COLLEGE, DARJEELING	G
20	GURUNANAK INSTITUTE OF DENTAL SCIENCE & RESEARCH, PANIHATI, KOLKATA	P
21	HALDIA INSTITUTE OF DENTAL SCIENCES AND RESEARCH, HALDIA, PURBA MEDINIPUR	P
22	BURDWAN DENTAL COLLEGE, BURDWAN	G

**#Central Government Institute**

**Fee structure of Private Institutes and Central Government Institutes are not at par with the same of the State Government Institutes.**

**Updated (if any) list will be available before counseling**



## APPENDIX – VII

**PROFORMA A-I****Residential/Domicile Certificate for candidates residing in the State of West Bengal  
continuously for at least last ten (10) years as on 31.12.2015**

Certified that \_\_\_\_\_

Son / daughter of \_\_\_\_\_ is a resident/permanent

Resident of West Bengal at Village/House No. \_\_\_\_\_

Street \_\_\_\_\_

Post Office \_\_\_\_\_ Police Station \_\_\_\_\_

In the District of \_\_\_\_\_ under Assembly Constituency

\_\_\_\_\_ and has been living in the State of West Bengal  
continuously / uninterruptedly at least for the last ten (10) years as on 31-12-2015.

Paste 2" x 1½" size  
recent colour  
photograph in this  
box

Candidate's signature

**Candidate must sign here in front of the certifying  
authority**

**(Candidate's photograph)**

Signature of Certifying Authority \_\_\_\_\_

Designation with Official Seal \_\_\_\_\_

Full Name of Certifying Authority \_\_\_\_\_

Office Address \_\_\_\_\_

Office Phone No. \_\_\_\_\_ Mobile No: \_\_\_\_\_ (optional)

ID No: \_\_\_\_\_ (optional)

*Note: Photograph is to be attested by the certifying authority.  
The Certifying Authority should preserve a duplicate copy of this Certificate.*

## APPENDIX – VIII

**PROFORMA A-II****Residential/Domicile Certificate for candidates residing in the State of West Bengal continuously for at least last ten (10) years as on 31.12.2015**

Certified that \_\_\_\_\_ son / daughter of \_\_\_\_\_ has passed the '10+2' Examination in the year \_\_\_\_\_ / will appear in the Final '10+2' Examination in 2016 from this Institution. It is also certified that the student is a resident/permanent resident of West Bengal at

Village/House No. \_\_\_\_\_

Street \_\_\_\_\_ Post Office \_\_\_\_\_

Police Station \_\_\_\_\_ in the District of \_\_\_\_\_

under Assembly Constituency \_\_\_\_\_ and has been living and studying in the State of West Bengal continuously / uninterruptedly at least for the last ten (10) years as on 30-12-2015.

Paste 2" x 1½" size  
recent colour  
photograph in this  
box

Candidate's signature

**Candidate must sign here in front of the certifying authority**

**(Candidate's photograph)**

Signature of Certifying Authority \_\_\_\_\_

Designation with Official Seal \_\_\_\_\_

Full Name of Certifying Authority \_\_\_\_\_

Office Address \_\_\_\_\_

Office Phone No. \_\_\_\_\_ Mobile No: \_\_\_\_\_ (optional)

ID No: \_\_\_\_\_ (optional)

*Note: Photograph is to be attested by the certifying authority.  
The Certifying Authority should preserve a duplicate copy of this Certificate.*

## APPENDIX – IX

**PROFORMA B**

**Residential/Domicile Certificate for candidates not residing in the State of West Bengal but whose parent(s) is (are) permanent resident(s) of West Bengal having their permanent home address within West Bengal.**

Certified that \_\_\_\_\_

Father/ mother of \_\_\_\_\_ (the applicant) is/ are permanent Resident of West Bengal at Village/House No. \_\_\_\_\_

Street \_\_\_\_\_

Post Office \_\_\_\_\_ Police Station \_\_\_\_\_

In the District of \_\_\_\_\_

Under Assembly Constituency \_\_\_\_\_

Paste 2" x 1½" size  
recent colour  
photograph of the  
candidate in this box

Paste 2" x 1½" size  
recent colour  
photograph of  
father/ mother of  
the candidate in this  
box

Candidate's Signature

**Candidate must sign here in front of  
the certifying authority**

Father's/ Mother's Signature

**(Candidate's Photograph) (Father's/ Mother's Photograph)**

Signature of Certifying Authority \_\_\_\_\_

Designation with Official Seal \_\_\_\_\_

Full Name of Certifying Authority \_\_\_\_\_

Office Address \_\_\_\_\_

Office Phone No. \_\_\_\_\_ Mobile No: \_\_\_\_\_ (optional)

ID No: \_\_\_\_\_ (optional)

*Note: Photographs are to be attested by the certifying authority.  
The Certifying Authority should preserve a duplicate copy of this Certificate.*

**APPENDIX – X****Proforma for Income Certificate**

Certified that the TOTAL ANNUAL FAMILY INCOME FROM ALL SOURCES of

\_\_\_\_\_ son/daughter of \_\_\_\_\_

residing at \_\_\_\_\_ Post Office \_\_\_\_\_

Police Station \_\_\_\_\_ in the district of \_\_\_\_\_

in the state of West Bengal for the year 2015-2016 is less than Rs. 2.50 lakhs ( Rupees two lakhs and fifty thousand only) and stands at Rs. \_\_\_\_\_ (Rupees

\_\_\_\_\_ )

Paste 2" x 1½" size  
recent colour  
photograph of the  
candidate in this box

Candidate's signature

**Candidate must sign here in front of the certifying  
authority**

**(Candidate's Photograph)**

Signature of Certifying Authority \_\_\_\_\_

Designation with Official Seal \_\_\_\_\_

Full Name of Certifying Authority \_\_\_\_\_

Office Address \_\_\_\_\_

Office Phone No. \_\_\_\_\_ Mobile No: \_\_\_\_\_ (optional)

ID No: \_\_\_\_\_ (optional)

*Note: Photographs are to be attested by the certifying authority.  
The Certifying Authority should preserve a duplicate copy of this Certificate.*

## APPENDIX – XI

**District-wise list of zones for choosing examination centre**

<b>District</b>	<b>Zone</b>				
Alipurduar	Alipurduar				
Bankura	Bishnupur	Bankura			
Birbhum	Suri	Bolpur			
Burdwan	Bardhaman	Durgapur	Asansol		
Coochbehar	Coochbehar				
Darjeeling	Siliguri	Kurseong			
Dinajpur Dakshin	Balurghat				
Dinajpur Uttar	Raiganj				
Hooghly	Chinsurah	Bandel	Srirampur	Arambagh	
Howrah	Uluberia	Bally	Shibpur	Central	Domjur
Jalpaiguri	Jalpaiguri				
Kolkata	College Street	Sealdah	Taratala	Ballygunje	Khidirpur
	Shyambazar	Park Circus	Esplanade	Tollygunje	Behala
Malda	Malda				
Medinipur Paschim	Kharagpur	Medinipur	Jhargram	Garbeta	
Medinipur Purbo	Tamluk	Haldia	Contai		
Murshidabad	Berhampur	Jiaganj	Raghunathganj		
Nadia	Krishnanagar	Kalyani			
Purulia	Purulia				
24 Pgs North	Barrackpur	Dum Dum	Barasat	Habra	Basirhat
	Salt Lake				
24 Pgs South	Budge Budge	Diamond Harbour	Jainagar	Sonarpur	Garia
<b>Other States</b>					
Tripura	Agartala				
Assam	Silchar				

***The candidates may not be allocated in his/her 1st Choice Zone, if sufficient candidates are not available. In such case, the 2nd Choice/ 3<sup>rd</sup> choice of Zone would be allocated.***

**APPENDIX – XII****Important dates**

	<b>Activity</b>	<b>Date (with time)</b>
1.	Publication of Information Brochure along with proforma for domicile and income certificates in the public domain <a href="http://www.wbjeeb.nic.in">www.wbjeeb.nic.in</a>	<b>24/12/2015</b>
2.	Start of Online form fill-up	<b>05/01/2016</b>
3.	Last date of online form fill-up and registration	<b>29/02/2016 (11:59 PM)</b>
4.	Last date of document uploading	<b>02/03/2016 (11:59 PM)</b>
5.	Last date of fee payment	<b>05/03/2016 (11:59 PM)</b>
6.	Last date of printing confirmation page	<b>31/03/2016 (11:59 PM)</b>
7.	Window for correction (based on Board's feedback and self-induced errors) along with uploading of correct certificates etc by candidates.	<b>07/03/2016 (10:30 AM) to 12/03/2016 (11:59 PM)</b>
8.	Publication of Downloadable Admit Card in <a href="http://www.wbjeeb.nic.in">www.wbjeeb.nic.in</a>	<b>04/04/2016 (10:30 AM)</b>
9.	Examinations:  Biological Sciences  Physics & Chemistry  Mathematics	<b>17.05.2016. (9 AM to 11.30 AM)</b>  <b>17.05.2016. (12.45 PM to 2.45 PM)</b>  <b>17.05.2016. (3.30 PM to 5.30 PM)</b>
10.	Publication of Results	<b>05/06/2016</b>

**Note: All schedules are subject to change under unavoidable circumstances.**