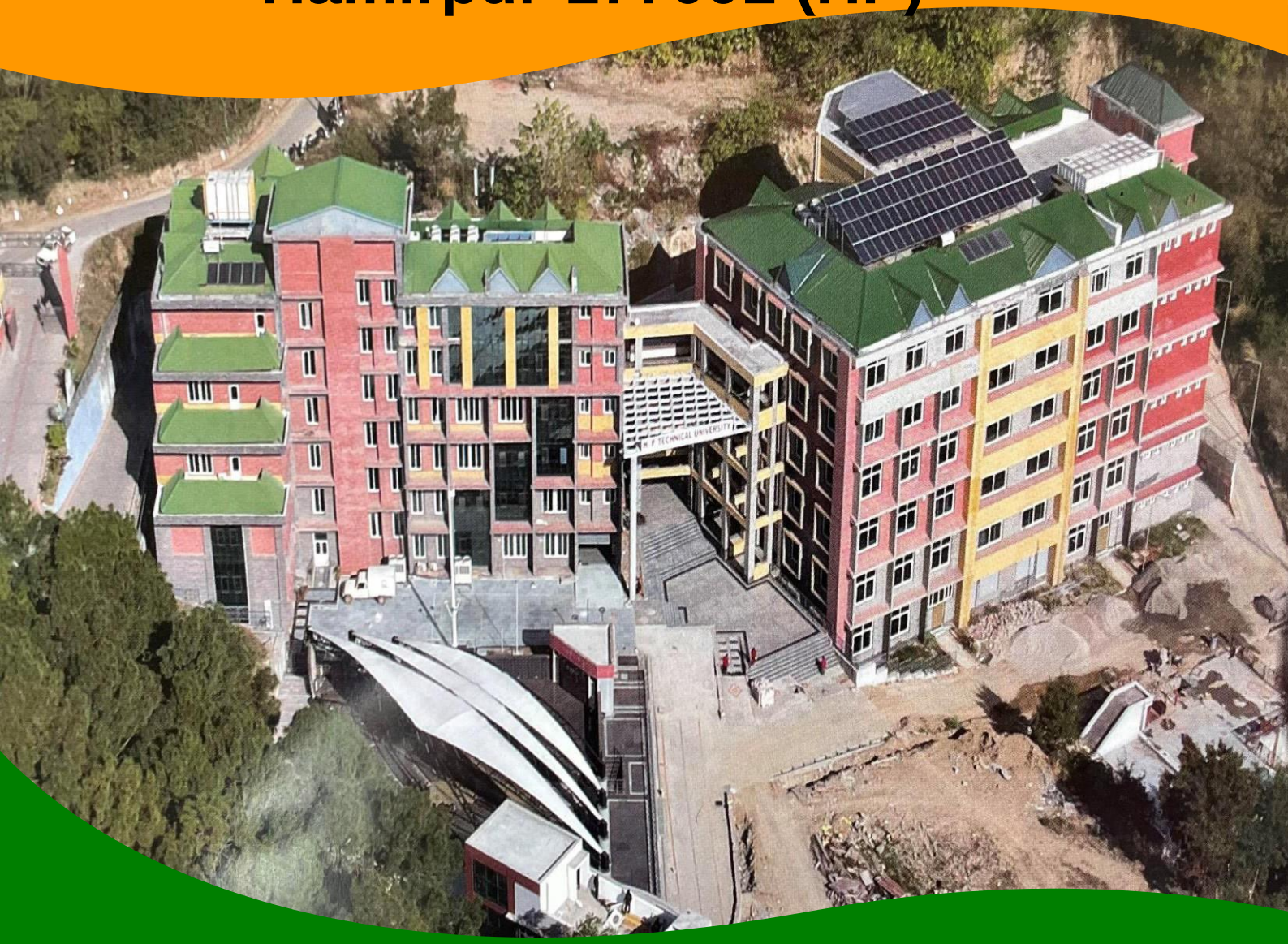
Himachal Pradesh Technical University
Hamirpur-177001 (HP)



Prospectus Part-I

INFORMATION BROCHURE

2025

Himachal Pradesh Common Entrance Test-2025

(HPCET–2025)

ENTRANCE TEST FOR ADMISSION TO
VARIOUS TECHNICAL & PROFESSIONAL COURSES
OF THE UNIVERSITY

THE UNIVERSITY

Preamble

The Himachal Pradesh Technical University (HPTU) was established in the year 2010 by an Act of Legislative Assembly of Himachal Pradesh with an objective for value creation and welfare of the society through technical education, training, research, innovation, entrepreneurship and continuing education programs. At the same time, the University is responsive to changing and exceptional requirements of our society and economy and contributes to find answers to global problems. The University offers both short-term and long-term programs leading to Advance Diploma and Degrees, which are conventional as well as innovative through public and private participation. Most of these programs have been developed after an initial survey of the demand for such Programs. The programs offered are designed to equip graduates and postgraduates with the necessary skills and expertise to be the leaders in their chosen professions. The key to success lies in the high premium it places on innovation, along with the work that is done by different players and stakeholders to promote the University achievements in the fields of Science, Engineering and Technology. This is being achieved through a benchmarking system, which ensures that training and research programs always meet the highest standards. National Education Policy – 2020 is being implemented in all the programs.

Vision

Our vision of autonomous Himachal Pradesh Technical University as dynamic, flexible institution promoting research led inter disciplinary learner-centric technical education which generates added value in teaching-learning, research and knowledge required for promoting integrated national development with global understanding.

Core Values

A primary core value of any university is academic freedom, which is enshrined in the Constitution of the Republic of India. This core value must be buttressed by institutional autonomy, but with in an environment where public accountability i s seen as a virtue. Principles and behaviors defined in the Charter must accord with these and the institutional core values below:

- **Customer Service; Integrity; Diversity and Innovation**

Queries related to **on-line filling of application form** HPCET 2025 may be addressed to:

The Dean-Academic,
Himachal Pradesh Technical University (HPTU),
VPO Daruhi, Distt. Hamirpur (H.P.), PIN-177 001

Email Id**: queryadmission@outlook.com**
Tel. No.: 01972 226914, 226911

Queries related to **examination centers/admit cards** of HPCET 2025 may be addressed to:

The Controller of Examinations,
Himachal Pradesh Technical University (HPTU),
VPO Daruhi, Distt. Hamirpur (H.P.), PIN-177 001

Email Id: **coehimtu@gmail.com**

Tel. No.: 01972 226908, 226910, 226999

Message of Hon'ble Vice Chancellor

Dear Students and Parents,

It is my privilege to welcome you to Himachal Pradesh Technical University which was established by the Government of Himachal Pradesh in the year 2010. The prime objective of this University is to disseminate advance knowledge, wisdom and understanding in the fields of education, research and training in Engineering, Technology, Pharmacy and Management, and imbibe all those qualities which are essential to make our students contribute effectively to the advancement of the society.

All are aware that the Engineers and Scientists can best be thought of as creators, innovators, problem solvers, builders and leaders in the World. Keeping this fact in mind, Himachal Pradesh Technical University provides quality technical education in different fields to prepare the students enrolled with it to become good contributors to the society in all respects. The degrees offered by this University in various streams are the gateway for the upward growth of the students to pursue their career.

To achieve Sustainable Developments Goals (SDGs) adopted by all United Nations Member States relating to education such as SDG-4 (quality education), SDG-5 (gender equality), SDG-1 (no poverty), and SDG-8 (decent work and economic growth)-In India, recent National Education Policy (NEP) envisions a transformative approach to inclusive education for diverse backgrounds of the students and emphasized to create an environment that enables, honours and promotes diversity. Accordingly, the University has designed a curriculum framework with multiple exit and multiple entry for dual degree programme (BS-MS), (BS-MBA) with honours, blended with STEM subject such as Computer Science/Management Sciences/Data Science/Business Analytics and Sustainability/Development Studies and Public Policy/Sciences/Engineering/Pharmacy. In the curriculum framework of UG and PG programmes, the provisions have been made for the students to undergo one semester industrial/research internship programmes under the ambit of University-industrial-interaction. These industrial/research internships are aimed to improve employability skills and can help in developing competency, capability, professional working skills, expertise and confidence among the students for employability and developing interest for research.

By encouraging inclusive education, the Technical University is committed to ensure that every student receive a quality education and is equipped with the skills required in the 21st Century, irrespective of their background or ability.

I invite all students and their parents who are seeking admission in institutions and main campus of Technical University to take up this opportunity and together we can create an education system that empowers minds, transforms lives and builds an equitable society.

Sd/-
(Prof. Shashi Kumar Dhiman)

Message of Dean - Academic

Dear prospective Students,

It is a matter of immense pleasure for me to be a part of the Himachal Pradesh Technical University (HPTU), Hamirpur family as its Dean (Academic). I take this opportunity of welcoming students coming from all parts of the world, joining the University in undergraduate as well as postgraduate programmes. In their quest for knowledge, most of such students shall be moving away from the folds of their family. One needs to realize that they are just moving away from one family fold to another. Their teachers, seniors and peers, all form an extended family to whom they can look up for any guidance, support and help to move ahead in life as professionals in their study programmes they have opted for.

All the programs offered by HPTU follow the Choice Based Credit System (CBCS) with Outcome Based Approach. The flexibility in the curriculum has been designed with industry-specific goals in mind and the educator enjoys complete freedom to appropriate the syllabus by incorporating the latest knowledge and stimulating the creative minds of the students. Bench marked with the course of studies of various institutions of repute, our curriculum is extremely contemporary and is a result of brainstorming efforts of great think-tanks: faculty members, experts from industries and research level organizations. The evaluation mechanism employs continuous assessment with grade point averages. We sincerely believe that it will meet the aspirations of all stakeholders – students, parents and the prospective employers. Special care is being taken to implement National Education Policy (NEP) – 2020 focusing on its various components including skill development, multiple entry – exit, etc.

You shall learn how to think logically, deal with uncertainty, apply technology in a socially and environmentally responsible manner, communicate effectively and collaborate with others. Always remember that knowledge, know-how (skill), entrepreneurship and hard work coupled with dedication, devotion, determination and discipline are the keys to success. We, at HPTU, lay special emphasis on nourishing and motivating our students to "… become job providers than becoming job seekers …" when they go out to serve the society and the nation.

I extend hearty welcome to all those who are desirous of seeking admission in our campuses and constituent affiliated institutions located throughout the state of Himachal Pradesh. I am confident and wish that it acts as a stepping stone for you towards a successful career in the fascinating world of professional education. I am sure, HPTU will prove to be a 'home away from home' to all of you.

Good Luck!

Sd/-
Prof Jai Dev

LIST OF ABBREVIATIONS USED IN THIS BOOKLET

HPTU	*Himachal Pradesh Technical University, Hamirpur 177001, HP*
HPCET	*Himachal Pradesh Common Entrance Examination*
MBA	*Master of Business Administration*
MCA	*Master of Computer Applications*
MBA (T&HM)	*Master of Business Administration in Tourism & Hospitality Management*
M.Sc. Physics	*Master of Science in Physics*
M.Sc. Environmental Sciences	*Master of Science in Environmental Sciences*
B. Tech	*Bachelor of Technology*
B. Pharmacy	*Bachelor of Pharmacy*
BHMCT	*Bachelor of Hotel Management & Catering Technology*
B.Sc. (HM & CT)	*Bachelor of Science in Hotel Management & Catering Technology*
AICTE	*All India Council of Technical Education*
PCI	*Pharmacy Council of India*
UGC	*University Grants Commission*
UG	*Undergraduate*
PG	*Postgraduate*
OMR	*Optical Mark Recognition*
GEN	*General*
SC	*Scheduled Caste*
ST	*Scheduled Tribe*
OBC	*Other Backward Classes*
BPL	*Below Poverty Line*
EWS	*Economically Weaker Section*

Himachal Pradesh Technical University (HPTU)

Himachal Pradesh Common Entrance Test–2025 [HPCET–2025]

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*IMPORTANT DATES AT A GLANCE: *For Entrance Test*

EVENT	DATE
Start date of filling-in online Application Form for HPCET-2025 for B. Tech (Direct Entry), B. Pharmacy (Direct Entry), MCA, MBA, MBA (T&HM), B.Sc. (HM & CT)/BHMCT , M.Sc. Physics and M.Sc. Environment Sciences courses	**31.01.2025**
Closing date of filling-in online form of above courses	**18.04.2025**
Date and time of Entrance Examination for B. Tech. (Direct Entry), B. Pharmacy (Direct Entry) courses	**10.05.2025** (09.00AM to12:15PM)
Date and time of Entrance Examination for M.Sc. Physics course	**10.05.2025** (09.00AM to11:00AM)
Date and time of Entrance Examination for MBA, MBA (T&HM), MCA & B.Sc. (HM & CT)/BHMCT courses	**10.05.2025** (02:00PM to 04:00PM)
Date and time of Entrance Examination for M.Sc. Environment Sciences course	**11.05.2025** (09.00AM to11:00AM)
Tentative Date of Declaration of HPCET-2025 Result	By **21.05.2025**

*Kindly keep visiting University's website i.e., **www.himtu.ac.in** for the latest updates

#IMPORTANT INFORMATION: *After Entrance Test*

- After declaration of HPCET-2025 result, the candidates shall be required to apply separately on the prescribed application form for counselling. The form will be made available on HPTU's website i.e. **www.himtu.ac.in.**
- The Prospectus Part-II, Admission Brochure 2025-26, containing instructions for filling online application-cum-counseling form and other related information, will be made available on the website of the University in the month of May, 2025.
- The applicants are required to attend centralized counseling to get admission in various UG & PG courses of the University as notified in due course. The tentative schedule of events is as follows:

EVENT	DATE (TENTATIVE)
Publication of the **Prospectus Part-II: Admission Brochure 2025-26** on University's official website	May,2025
Online Application Form for centralized counseling available on University's official website	May,2025
Centralized counseling for admission to UG & PG courses for The academic session 2025-26	June, 2025
Start of the classes of various UG & PG courses for the academic Session 2025-26	Last week of July/1st week of August, 2025

#Kindly keep visiting University's website i.e., **www.himtu.ac.in** for the latest updates

Chapter 1: Introduction

1.1 About Himachal Pradesh Technical University

a. The Government of Himachal Pradesh has established the Himachal Pradesh Technical University with the mandate to create excellent competent environment to impart the technical education across the State. The University has been established with the following objectives: -

b. To develop the knowledge of science, engineering and technology, management and environment by teaching, research, experimentation or practical training for the advancement of quality of life of the mankind.

c. To supply the required skilled manpower of appropriate kind and quality to meet the needs of society and national development plans.

d. To develop patterns of teaching and training at various levels of educational accomplishment so as to set high standards of education in science, engineering and technology.

e. To drive benefits from the ever growing scientific and technological knowledge in different parts of the world and to advance frontiers of knowledge by research, innovation, invention and product development.

f. To establish close linkage with Industry to make teaching, training and research in the University relevant to the needs of society and industry at national and international level.

g. To establish, maintain and manage colleges, University schools & departments, centres of research and other institutions necessary to carry out the objects of the University.

h. To affiliate or recognize colleges or institutions within and outside the State of Himachal Pradesh.

i. To function as a leading resource Centre for knowledge management and entrepreneurship development in the area of Science and Technology.

1.2 Admission to Technical and Professional Courses: About HPCET

a. Himachal Pradesh Technical University Hamirpur, was established by Government of Himachal Pradesh under the State Legislative Act-16 of 2010.

b. Under the provision of Section-5 of the Himachal Pradesh Private Technical and Vocational Educational Institutions (Regulation of Admission and Fixation of Fee) Act, 2008, the State Government notified the eligibility criteria for admission in technical and professional courses from academic session 2018-19 in respect of the institutions as specified under Section -2 of the Act 2008.

c. Accordingly, the Himachal Pradesh Technical University (hereafter called as HPTU) will conduct Himachal Pradesh Common Entrance Test (hereafter called HPCET-2025) for admissions to B. Tech., B. Pharmacy, MCA, MBA, MBA (T&HM), B.Sc. (HM & CT)/BHMCT, M.Sc. Physics and M.Sc. Environment Sciences offered by HPTU and its affiliated colleges, deemed to be University or other Universities established under the State Act or constituent units thereto.

d. Admission to all the courses shall be made on the basis of merit or rank/marks obtained in the National Level Entrance Test/HPCET-2025, subject to fulfillment of minimum educational qualification given under section 2.9.

Chapter 2: Entrance Test Scheme

2.1 Mode of conduct of HPCET-2025: It will be conducted Offline

2.2 Language of the question papers : English

2.3 Syllabus for Entrance Test: Course-wise syllabus is given in Appendix (A to E) as indicated:

Sr. No.	Name of Course	Appendix
1	B. Tech	**A**
2	B. Pharmacy (Allopathy)	
3	B.Sc. (HM & CT)/BHMCT	**B**
4	MCA, MBA and MBA(T&HM)	**C**
5	M.Sc. Physics	**D**
6	M.Sc. Environmental Sciences	**E**

2.4 Pattern for HPCET-2025 for UG Courses: B. Tech. and B. Pharmacy (Allopathy)

SN	Subject	Section	Number of Questions	Total Questions to be attempted	Marks (per question X total questions)	Total Marks	Type of Questions	Duration
1	Physics	Section A	20	All 20	4x20	80	MCQs (Multiple Choice Questions)	**3Hours & 15 Minutes**
		Section B	40	30	4x30	120		
2	Chemistry	Section A	20	All 20	4x20	80		
		Section B	40	30	4x30	120		
3	Mathematics or Biology	Section A	20	All 20	4x20	80		
		Section B	40	30	4x30	120		
Total		-	-	**150**	4x150	**600**	-	

Note: Correct option marked will be awarded four (4) marks and Incorrect option marked will be awarded minus one (-1) mark. Unattempted/Unanswered Questions will be awarded no mark (0).

Important Points to Note:

(a) The duration of examination will be 3 hrs. &15 minutes.

(b) **For Section A (MCQs):** All the given 20 questions are compulsory.
For Section B (MCQs): Candidates need to attempt any 30 Questions out of given 40 Questions. In the event of a candidate have attempted more than 30 questions, only the first 30 attempted questions will be considered for evaluation.

(c) To answer a question, the candidates need to choose one option corresponding to the correct answer or the most appropriate answer.

(d) **There will be negative marking for both the Sections.**

However, if any anomaly or discrepancy is found after the process of challenges of the key verification, it shall be addressed in the following manner:

(i) Correct answer or the most appropriate answer: Four marks (+4).
(ii) Any incorrect option marked will be given Minus one mark (-1).
(iii) Unanswered/unmarked question will be given no mark (0).
(iv) If more than one option is found to be correct, then four marks (+4) will be awarded to only those who have marked any of the correct options.
(v) If all options are found to be correct, then Four marks (+4) will be awarded to all those who have attempted the question.
(vi) If none of the options is found correct or a Question is found to be wrong or a Question is dropped, then all candidates who have appeared will be given four marks (+4) irrespective of the fact whether the question has been attempted or not by the candidate.
(vii) Candidates are advised to do the calculations with the constants given (if any) in the questions.

2.5 Pattern for HPCET-2025 for B.Sc. (HM & CT)/BHMCT

S N	Subject	Section	Number of Questions	Total Questions to be attempted	Marks (per question x total questions)	Total Marks	Type of Questions	Duration
1	General English	A	25	25	1 x25	25	MCQs (Multiple Choice Questions)	Two Hours
2	General Knowledge	B	25	25	1 x25	25		
3	Reasoning	C	25	25	1 x25	25		
4	Data Interpretation	D	25	25	1 x25	25		
Total		-	-	100	4x25	100	-	
Note: Correct option marked will be given one (1) mark and Incorrect option marked will be given minus one fourth (-1/4) mark i.e. -0.25. Unattempt/Unanswered Questions will be given no marks (0).								

Important Points to Note:

- The duration of examination will be 2 hours.
- All the questions are compulsory
- To answer a question, the candidates need to choose one option corresponding to the correct answer or the most appropriate answer.
- **There will be negative marking for all the Sections.**
- However, if any anomaly or discrepancy is found after the process of challenges of the key verification, it shall be addressed in the following manner:
- Correct answer or the most appropriate answer: one mark (+1).
- Any incorrect option marked will be given minus one fourth mark (-1/4) i.e. -0.25.

- Unanswered/Marked for Review will be given no mark (0).
- If more than one option is found to be correct, then one marks (+1) will be awarded to only those who have marked any of the correct options.
- If all options are found to be correct, then one mark (+1) will be awarded to all those who have attempted the questions.
- If none of the options is found correct or a Question is found to be wrong or a Question is dropped, then all candidates who have appeared will be given one mark (+1) irrespective of the fact whether the question has been attempted or not by the candidate.
- Candidates are advised to do the calculations with the constants given (if any) in the questions.

2.6 Pattern for HPCET-2025 for MCA, MBA and (MBA [T & HM])

S N	Subject	Section	Number of Questions	Total Questions to be attempted	Marks (per question x total questions)	Total Marks	Type of Questions	Duration
1	Verbal Ability & Reading Comprehension (VARC)	A	25	25	4 x25	100	MCQs (Multiple Choice Questions)	Two Hours
2	Data Interpretation & Logical Reasoning (DILR)	B	25	25	4 x25	100		
3	Quantitative Ability (QA)	C	25	25	4 x25	100		
Total		-	-	75	4 x75	300	-	
Note: Correct option marked will be awarded four (4) marks and incorrect option marked will be awarded minus one (-1) mark. Un-attempted / Un-answered Question will be awarded no marks (0).								

Important Points to Note:

- The duration of examination will be 2 hours.
- **There will be negative marking in all the Sections.**
  However, if any anomaly or discrepancy is found after the process of challenges of the key verification, it shall be addressed in the following manner:
- Correct answer 0r the most appropriate answer will be awarded Four marks (+4).
- Any incorrect option marked will be given Minus One mark (-1).
- Unanswered/unmarked question will be given No mark (0).
- If more than one option is found to be correct, then four marks (+4) will be awarded to only those who have marked any of the correct options.
- If all options are found to be correct, then Four marks (+4) will be awarded to all those who have attempted the question.
- If none of the options is found correct or a Question is found to be wrong or a Question is dropped, then all candidates, who have appeared, will be awarded four marks (+4) irrespective of the fact whether the question has been attempted or not by the candidate.
- Candidates are advised to do the calculations (if any) with the constants given (if any) in the questions.

2.7 Pattern for HPCET-2025 for M.Sc. Physics

S N	Subject	Section	Number of Questions	Total Questions to be attempted	Marks (per question x total questions)	Total Marks	Type of Questions	Duration
1	Mathematics methods, Classical mechanics and general properties of matter	A	25	25	1 x25	25	MCQs (Multiple Choice Questions)	Two Hours
2	Optics, Electricity and magnetism	B	25	25	1 x25	25		
3	Modern Physics, Nuclear and Particle Physics	C	25	25	1 x25	25		
4	Atomic and Molecular, Kinetic Theory of gases and Thermodynamics, Solid State Physics and Electronics	D	25	25	1 x25	25		
Total		-	-	100	4x25	100	-	
Note: Correct option marked will be given one (1) mark and Incorrect option marked will be given minus one fourth (-1/4) mark I.e. -0.25. Unattempt/Unanswered Questions will be given no marks (0).								

Important Points to Note:

- The duration of examination will be 2 hours.
- All the questions are compulsory
- To answer a question, the candidates need to choose one option corresponding to the correct answer or the most appropriate answer.
- **There will be negative marking for all the Sections.**
- However, if any anomaly or discrepancy is found after the process of challenges of the key verification, it shall be addressed in the following manner:
- Correct answer or the most appropriate answer: one mark (+1).
- Any incorrect option marked will be given minus one fourth mark (-1/4) i.e. -0.25.
- Unanswered/Marked for Review will be given no mark (0).
- If more than one option is found to be correct, then one marks (+1) will be awarded to only those who have marked any of the correct options.
- If all options are found to be correct, then one mark (+1) will be awarded to all those who have attempted the questions.
- If none of the options is found correct or a Question is found to be wrong or a Question is dropped, then all candidates who have appeared will be given one mark (+1) irrespective of the fact whether the question has been attempted or not by the candidate.
- Candidates are advised to do the calculations with the constants given (if any) in the questions.

2.8 Pattern for HPCET-2025 for M.Sc. Environmental Sciences

S N	Subject	Section	Number of Questions	Total Questions to be attempted	Marks (per question x total questions)	Total Marks	Type of Questions	Duration
1	Earth Sciences	A	25	25	1x25	25	MCQs (Multiple Choice Questions)	Two Hours
2	Physical and Chemical Sciences	B	25	25	1x25	25		
3	Life Sciences	C	50	50	1x50	50		
	Total			100	100	100		
Note: Correct option marked will be given one (1) mark and Incorrect option marked will be given minus one fourth (-1/4) mark i.e. -0.25. Unattempt/Unanswered Questions will be given no marks (0).								

Important Points to Note:

- The duration of examination will be 2 hours.
- All the questions are compulsory
- To answer a question, the candidates need to choose one option corresponding to the correct answer or the most appropriate answer.
- **There will be negative marking for all the Sections.**
- However, if any anomaly or discrepancy is found after the process of challenges of the key verification, it shall be addressed in the following manner:
- Correct answer or the most appropriate answer: one mark (+1).
- Any incorrect option marked will be given minus one fourth mark (-1/4) i.e. -0.25.
- Unanswered/Marked for Review will be given no mark (0).
- If more than one option is found to be correct, then one marks (+1) will be awarded to only those who have marked any of the correct options.
- If all options are found to be correct, then one mark (+1) will be awarded to all those who have attempted the questions.
- If none of the options is found correct or a Question is found to be wrong or a Question is dropped, then all candidates who have appeared will be given one mark (+1) irrespective of the fact whether the question has been attempted or not by the candidate.
- Candidates are advised to do the calculations with the constants given (if any) in the questions.

2.9 Eligibility Criteria

The candidates appearing in HPCET-2025 for seeking admission to a particular course must fulfill the eligibility criteria for the corresponding course as per norms of All India Council of Technical Education (AICTE) / PCI / UGC or as applicable. The minimum eligibility criteria for the different courses is given in Table 2.9.1 -

Table 2.9.1: Minimum eligibility criteria for appearing in HPCET-2025

Course	Minimum eligibility for appearing in HPCET-2025
B. Tech (Direct Entry)	Passed 10+2 examination with Physics / Mathematics / Chemistry / Computer Science / Electronics / Information Technology / Biology / Informatics Practices / Biotechnology / Technical Vocational subject / Agriculture / Engineering Graphics / Business Studies / Entrepreneurship (as per **Appendix-F**) Agriculture stream(for Agriculture Engineering) Obtained at least 45% marks (40% marks in case of candidates belonging to reserved category) in the above subjects taken together. **OR** Passed D. Voc. Stream in the same or allied sector.
B. Pharmacy Allopathy (Direct Entry)	Passed / appeared 10+2 examination from a recognized Board or University with Physics and Chemistry as compulsory subjects along with one of the Mathematics / Biology subject securing at least 45% marks (40% reserved category) in the these subjects taken together. Provided that a student should complete the age of 17 years on or before 31st December of the year of admission to the course.
B.Sc. (HM & CT) /BHMCT	All those candidates who have passed 10+2 examination in any stream from a Board recognized or established by Central/State Government through legislation shall be eligible to apply. Further the candidate should have obtained at least 45% marks (40% in case of candidate belonging to reserve category) in the qualifying examination
MBA and MBA (T&HM)	Passed Bachelor Degree of minimum 3years duration. Obtained at least 50% marks (45% marks in case of candidates belonging to reserved category) in the qualifying examination.
MCA	Passed any graduation degree (e.g.: B.E. / B. Tech. / B. Sc / B.Com. / B.A ./ B. Voc./ BCA etc.,) preferably with Mathematics at 10+2 level or at Graduation level. Obtained at least 50% marks (45% marks in case of candidates belonging to reserved category) in the qualifying examination. (For students having no Mathematics background, compulsory bridge course will be framed by the respective University/ Institution and additional bridge courses related to computer subjects as per the norms of the concerned University).
M.Sc. Physics	All those candidates who have passed bachelor degree in science, B.Sc. with Physics, Chemistry and Mathematics with a minimum 50% marks (45% in case of reserved categories) in aggregate in the three years of degree or Honors in the concerned subject. i.e. Physics.

M.Sc. Environmental Sciences	Candidates who have passed any Bachelor/UG Degrees in any branch/stream of basic/applied sciences examinations including Engineering/Medical Sciences, Pharmacy, Architecture from the recognized institution/University with a minimum of 50% Marks (45% in case of reserved categories)

Note:-

(i) The candidates who are appearing for their final examination of 10+2 or bachelor degree examination in March/April, 2025 shall be eligible to appear in HPCET-2025 but the final selection is subject to fulfilling the prescribed eligibility criteria.

(ii) In case the percentage of marks in the qualifying examination is in fractions, the same shall be rounded off to the nearest figure.

2.10 Admission Process

Admission to the aforementioned courses shall be made on the basis of merit (rank/marks) of HPCET-2025 and applicable National Level Entrance Tests subject to fulfillment of minimum educational qualification criteria as mentioned in Table 2.9.1. **The Admission criteria and procedure, including rules and regulations, shall be available in the Prospectus–II (Admission Brochure 2025-26)** which will be available on HPTU website: **www.himtu.ac.in** after declaration of HPCET-2025 result.

2.11 Seats Available

The seats available, in different affiliated Institutions in UG and PG courses for the academic year 2025-26, shall be specified separately in the **Prospectus–II (Admission Brochure 2025-26)**. However, the tentative seats available in colleges affiliated to Himachal Pradesh Technical University and University campus / Off-Campuses in UG & PG Programmes [**as per Previous Year 2024-25**] are given hereafter:

a. B. Pharmacy Institutions:

SN	Name of the Institutions	Sanctioned Intake
1	Govt. College of Pharmacy, Rohru, Distt. Shimla (HP) 171207	60
2	Govt. Pharmacy College Kangra at Nagrota Bagwan, Distt. Kangra (HP)	60
3	Govt. Pharmacy College Seraj, Bagsaid, Tehsil-Thunag, Distt. Mandi (HP)	60
4	HPTU off Campus Govt. Pharmacy College Rakkar,V.P.O-Kuhna, Tehsil Rakkar, Distt. Kangra (HP) 177043	60
5	Govt. Pharmacy College Sullah, Camp at Govt. Degree College Naura, Distt. Kangra, (HP)	40
6	Abhilashi College of Pharmacy, Ner Chowk, Tehsil Balh, Distt.Mandi–175008 (HP)	100
7	DDM College of Pharmacy, Gondpur Banehra (Upper), Tehsil Amb, Distt.Una (HP)	60
8	Dreamz College of Pharmacy, Village Khilra, PO Meramasit, Tehsil Sundernagar, Distt. Mandi (HP)	60
9	Himachal Institute of Pharmaceutical Education & Research (HIPER),VPO Bela, Tehsil Nadaun, Distt. Hamirpur (HP)	60
10	Himachal Institute of Pharmacy, Rampur Ghat Road, Paonta Sahib, Distt. Sirmour, (HP)	100
11	Himachal Pharmacy College, Village Majuali, Maganpura, Tehsil Nalagarh, Distt. Solan (HP)	60
12	Himalayan Institute of Pharmacy, Near Suketi Fossil Park Road, Kala Amb, Distt. Sirmour (HP)	100
13	KC Institute of Pharmaceutical Sciences, VPO. Pandoga uparla, Distt. Una. (HP)-177207	100
14	Laureate Institute of Pharmacy, VPO Kathog, Tehsil Dehra, Distt. Kangra, (HP)-177101	100
15	LR. Institute of Pharmacy, Vill. Jabli-Kyar, PO Ochghat, Sultanpur Road, Distt. Solan (HP)	100

16	Shiva Institute of Pharmacy, Village Luhnu Kanaitan, P.O. Chandpur, Tehsil Sadar, Distt.Bilaspur (HP)-174 004	100
17	Vinayaka College of Pharmacy, Village Bohoguna, P.O. Garsa, Distt. Kullu (HP) – 175146	100
18	Gautam College of Pharmacy, Hamirpur (H.P.)	100
19	Minerva College of Pharmacy, Village Changrara, P.O. Bhapoo, Teh. Indora, Distt. Kangra (HP)	60
20	Aakash Institute of Medical Sciences, Nalagarh, Distt. Solan (HP)	100
21	Shanti Niketan College of Pharmacy, Tehsil- Balh, Distt. Mandi (HP)	60
22	SIRDA Polytechnic, Vill-Naulakha, PO-Tarot, Tehsil-Sundernagar, Distt. Mandi (HP)	60
23	Shaheed Bhagat Singh College of Pharmacy, Palampur, Distt. Kangra (HP)	60

b. B. Pharmacy (Practice) Institution

SN	Name of the Institutions	Sanctioned Intake
1	Laureate Institute of Pharmacy, VPO Kathog, Tehsil Dehra, Distt. Kangra, (HP)-177101	40

c. Pharm. D Institution

SN	Name of the Institutions	Sanctioned Intake
1	Laureate Institute of Pharmacy, VPO Kathog, Tehsil Dehra, Distt. Kangra, (HP)-177101	30

d. B. Tech/B. Architecture Institutions

SN	Name of the Institutions	Name of Course	Sanctioned Intake
1	Department of Computer Science Engineering, Himachal Pradesh Technical University Campus at Daruhi Hamirpur (HP)	Computer Science Engineering	60
2	Atal Bihari Vajpayee College of Engg. Pragtinagar, Distt- Shimla, (HP)	Computer Science Engg.	48
		Electronics & Communication Engg.	48
		Electrical Engg.	48
3	Jawahar Lal Nehru Govt. Engineering College, Bechhandhar, Sundernagar, Distt. Mandi (HP)	Civil Engg.	60
		Computer Science Engg. (Artificial Intelligence & Machine Learning)	60
		Electronics & Communication Engg.	60
		Mechanical Engg.	60
		Textile Engg.	60

4	Rajiv Gandhi Govt. Engg. College, Kangra at Nagrota Bagwan, Kangra (HP)	Civil Engg.	60
		Electrical Engg.	60
		Electronics & Communication Engg.	60
		Mechanical Engg.	60
		B. Architecture	40
5	Mahatma Gandhi Govt. Engg. College Jeori (Kotla), Rampur Distt. Shimla (HP)	Civil Engg.	60
		Mechanical Engg	60
6	Govt. Hydro Engg. College, Bandla, Distt. Bilaspur (HP)	Civil Engg.	51+9*
		Electrical Engg.	51+9*
		Computer Science Engg. (Artificial Intelligence & Data Science)	51+9*
7	Govt. PG College Dharmashala, Civil Line, Dharmashala, Distt. Kangra, (HP)	Computer Science Engg.	60
8	Green Hills Engineering College, Gandhi Gram, Kumarhatti, Nahan Road, P.O. Bohli, Distt. Solan (HP)	Civil Engg.	60
		Electrical Engg.	60
		Computer Science Engg.	60
		Mechanical Engg.	60
9	Himachal Institute of Engg. & Technology, Vidyanagar, Shahpur, Kangra (HP)	Civil Engg.	60
		Electrical & Electronics Engg.	60
		Computer Science Engg.	30
		Mechanical Engg.	30
10	Himalayan Institute of Engineering & Technology, Near Saketi, Sadhaura Road, Kala Amb, Tehsil Nahan, Distt. Sirmour, (HP)	Civil Engg.	30
		Electrical Engg.	30
		Computer Science Engg.	120
		Mechanical Engg.	30
		Computer Science Engg. (Artificial Intelligence & Machine Learning)	60
11	K.C Educational and Social Welfare Society's Group of Research & Professional Institutes, VPO. Pandoga Uparla, Tehsil & Distt. Una (HP)	Civil Engg.	60
		Electrical Engg.	30
		Computer Science Engg.	60
		Mechanical Engg.	60
12	T.R. Abhilashi Memorial Institute of Engg. & Technology, Tanda, P.O Balt, Distt. Mandi (HP)	Civil Engg.	60
		Electrical Engg.	30
		Computer Science Engg.	30
13	Vaishno College of Engineering, Village Thapkour, P.O. Badhroya, Tehsil Nurpur, Kangra,(HP)	Civil Engg.	30
		Electrical Engg.	30
		Computer Science Engg.	30
		Mechanical Engg.	30
14	LR Engineering & Technology, Village Jabli-Kyar, PO-Oachghat, District- Solan (HP)	Civil Engg.	60
		Electrical Engg.	30
		Computer Science Engg.	30
		Computer Science Engg. (AI & ML)	30

*Nine (9) seats i.e.,15% of the sanctioned intake in each discipline shall be filled up through nomination from industry partners (NTPC and NHPC 7.5% each) as per the applicable admission norms.

e. M. Tech. Institutions

SN	Name of the Institutions	Name of Course	Sanctioned Intake
1	Department of Computer Science Engineering, Himachal Pradesh Technical University Campus At Daruhi (HP)	M. Tech. in Computer Science Engineering	24
2	Jawahar Lal Nehru Govt .Engineering College, Bechhandhar, Sundernagar, Distt. Mandi (HP)	M. Tech. in Civil Engineering (Construction Engineering & Management)	12

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f. MBA Institutions

SN	Name of the Institutions	Name of Course	Sanctioned Intake
1	Department of Management Studies, University Schools of Studies, Himachal Pradesh Technical University Campus at Daruhi (HP)	MBA	60
2	HPTU Business School, at Rajiv Gandhi Govt. Engineering College At Nagrota Bagwan, Distt. Kangra (HP)	MBA	40+5**
3	Government PG College, Dharamshala, Distt. Kangra (HP)–176215	MBA	60
4	Govt. PG Government College, Una, Distt. Una (HP)-174303	MBA	60
5	Himalayan Institute of Management, Kala Amb, Distt. Sirmour Sirmour (HP)-173030	MBA	90
6	K.C. Education and Social Welfare Society's Group of Research & Professional Institutes, VPO Pandoga Uparla, Tehsil & Distt. Una (HP)–177207	MBA	60
7	L.R Institute of Management, Village Jabli– Kyar, PO Oachghat, Sultanpur Road, Distt. Solan(HP) – 173223	MBA	60
8	Gautam Institute of Management & Technology, Hamirpur, (HP)	MBA	120

Five (5) Seats are under Sponsored Category for in-service persons. The candidates need not to pass the admission criteria and shall be admitted purely on the basis of merit of the qualifying examination provided they are duly sponsored by the employer. The candidates may send their applications along-with supporting documents through proper channel to **The Registrar, H.P. Technical University, Hamirpur 177701, HP by 15th July, 2025.

g. MBA (Tourism & Hospitality Management)

SN	Name of the Institutions	Name of Course	Sanctioned Intake
1	Department of Tourism & Hospitality Management, University Schools of Studies, Himachal Pradesh Technical University Campus at Daruhi (HP)	MBA (T&HM)	30

h. MCA Institutions

SN	Name of the Institutions	Name of Course	Sanctioned Intake
1	Department of Computer Application, Himachal Pradesh Technical University Campus at Daruhi (HP)	MCA	60
2	Government PG College Dharamshala, Distt. Kangra (HP)– 176215	MCA	60
3	Govt. PG Government College, Una, Distt. Una (HP)-174303	MCA	60

i. M.Sc. Physics, M.Sc. Environmental Sciences and PG Diploma in Yoga

SN	Name of the Institutions	Name of Course	Sanctioned Intake
1	Department of Basic Sciences, Himachal Pradesh Technical University Campus at Daruhi (HP)	M.Sc. Physics	30
2	Department of Environmental Sciences, Himachal Pradesh Technical University Campus at Daruhi (HP)	M.Sc. Environmental Sciences	30
3	Department of Yoga, Himachal Pradesh Technical University Campus at Daruhi (HP)	MA/M.Sc.in Yoga	30

j. M. Pharmacy Institutions

SN	Name of the Institutions	Name of Specialization	Sanctioned Intake
1	Laureate Institute of Pharmacy, VPO Kathog, Tehsil Dehra, Distt. Kangra (HP)-177101	M. Pharmacy in Pharmaceutics	15
		M. Pharmacy in Pharmaceutical Analysis	15
		M .Pharmacy in Pharmacology	15
2	LR. Institute of Pharmacy, Vill. Jabli- Kyar, PO Ochghat, Sultanpur Road, Distt. Solan (HP)– 173223	M. Pharmacy in Pharmaceutics	12
		M. Pharmacy in Pharmacology	09
3	Himachal Institute of Pharmacy, Rampur Ghat Road, Paonta sahib, Distt.Sirmour (HP)-173025	M. Pharmacy in Pharmaceutics	15
		M. Pharmacy in Pharmacology	6

4	Himalayan Institute of Pharmacy, Near Suketi Fossil Park Road, Kala Amb, Distt. Sirmour (HP)	M. Pharmacy in Pharmaceutics	15
5	Shiva Institute of Pharmacy, Village Luhnu Kanaitan, P.O.Chandpur, Tehsil Sadar, Distt. Bilaspur (HP)-174004	M. Pharmacy in Pharmaceutics	10
		M. Pharmacy in Pharmacognosy	10
		M. Pharmacy in Pharmacology	15
6	Himachal Institute of Pharmaceutical Education & Research (HIPER), VPO Bela, Tehsil Nadaun, Distt. Hamirpur (HP)	M. Pharmacy in Pharmaceutics	15
7	Gautam College of Pharmacy, Hamirpur (HP)	M. Pharmacy in Pharmaceutical Chemistry	15
		M. Pharmacy in Pharmaceutics	15
8	Dreamz College of Pharmacy, Village Khilra, PO Meramasit, Tehsil Sundernagar, Distt. Mandi (HP)	M. Pharmacy in Pharmaceutics	15
9	DDM College of Pharmacy, Gondpur Banehra (Upper), Tehsil Amb, Distt.Una (HP)	M. Pharmacy in Pharmaceutics	15

k. B.Sc. (HM & CT) and BHMCT

SN	Name of the Institutions	Name of Course	Sanctioned Intake
1	Department of Tourism & Hospitality Management, Himachal Pradesh Technical University Campus at Daruhi (HP)	BHMCT	30
2	HPTU Business School, at Rajiv Ghandi Govt. Engineering College, at Nagrota Bagwan, Distt. Kangra (HP)	B.Sc. (HM & CT)	60
3	K.C. Institution of Hotel Management & Catering Technology, VPO Pandoga Uparala, District Una (HP)	B.Sc. (HM & CT)	60
4	LR. Institute of Hotel Management & Catering Technology, Vill. Jabli-Kyar, PO Ochghat, Sultanpur Road, Distt. Solan (HP)–173223	B.Sc. (HM & CT)	60

Note:

(i) The status of seats shown against the respective institutions is tentative, based on the previous year's intake and seats may increase or decrease at the time of counseling/admissions for 2025-26.

(ii) Existing/New institutions offering the courses at UG and PG level offered by the H.P. Technical University may be added or deleted.

Chapter 3: Entrance Test Details and Instructions

3.1 Application Form

(a) All candidates have to apply online on the prescribed application form available on the University website *i.e.*, **www.himtu.ac.in** as per guidelines given in **Chapter 4**.

(b) The candidates must fill the application form in all respect carefully and check the same before submitting it.

(c) Incomplete application form shall not be considered and no correspondence shall be made in this regard.

(d) The application form once submitted can neither be taken back under any circumstances nor shall the application fee deposited be refunded in any case.

(e) Any application submitted after the prescribed last date will not be accepted.

(f) The applicants are required to pay the non-refundable entrance examination fee as mentioned under the following Section 3.2.

3.2 Entrance Test Fee

Non-refundable entrance examination fee for different categories is as under:

SN	Course	Fee(Rs.)		Remarks
		SC/ST/BPL	Others	
1	B. Tech.	800	1600	**Fee once paid shall not be refunded in any case**
2	B. Pharmacy (Allopath)	800	1600	
3	B. Tech. & B. Pharmacy **both**	1600	3200	
4	B.Sc.(HM & CT) / BHMCT	800	1600	
5	MCA	800	1600	
6	MBA	800	1600	
7	MBA(T&HM)	800	1600	
8	MBA & MBA(T&HM):**both**	1600	3200	
9	M.Sc. Physics	800	1600	
10	M.Sc. Environmental Sciences	800	1600	

3.3 Admit Card

(a) The e-admit card duly signed by the Controller of Examinations (CoE) will be made available to candidates on the University website, *i.e.*, **www.himtu.ac.in**. The candidates should download e-admit card by entering the application form number/ date of birth.

(b) The e-admit card will contain the e-admit card number, photograph of the student, address of the examination centre and examination date. Discrepancies, if any, must be brought to the notice of the Controller of Examinations, Himachal Pradesh Technical University, VPO Daruhi, Distt. Hamirpur (H.P.)-177001 immediately.

(c) Candidates should take a print of the e-admit card using the print option on A-4 size paper only. Please ensure that all information on the e-admit card including photograph is clearly visible on the print and e-admit card is duly signed by CoE.

(d) Candidates will not be permitted to appear for the written test without valid e-admit card.

(e) Candidates must not mutilate e-admit card or change any entry made there in after it has been authenticated and received by them. Impersonation is a legally punishable offence.

(f) The e-admit card is an important document and it must be preserved and produced at the time of entrance examination / test. **Candidate should report to the allotted examination centre along with e-admit card and ID proof like AADHAR card etc. at least half an hour before the commencement of examination**.

3.4 Schedule of Entrance Test

Sr. No.	Course	Date of Common Entrance Test (HPCET-2025)	Tentative Date(s) of Declaration of Result
1.	B. Tech. (Direct Entry)	10.05.2025: SATURDAY (09:00AM-12.15 PM)	By 21.05.2025
2.	B. Pharmacy (Direct Entry)	10.05.2025: SATURDAY (09:00AM-12.15 PM)	By 21.05.2025
3.	B.Sc. (HM & CT)/BHMCT	10.05.2025: SATURDAY (02:00 PM to 04:00 PM)	By 21.05.2025
4.	MCA	10.05.2025: SATURDAY (02:00PM-04.00 PM)	By 21.05.2025
5.	MBA and MBA(T&HM)	10.05.2025: SATURDAY (2.00PM-4.00 PM)	By 21.05.2025
6.	M.Sc. Physics	10.05.2025: SATURDAY (09:00AM-11.00 AM)	By 21.05.2025
7.	M.Sc. Environmental Sciences	11.05.2025: SUNDAY (09:00AM-11.00 AM)	By 21.05.2025

3.5 Test Centers of HPCET-2025

- **For Courses (B. Tech. & B. Pharmacy Direct Entry)**

The centers will be established in Bilaspur, Chamba, Hamirpur, Mandi, Kangra, Shimla, Solan, Kullu, Sirmour, Una districts of HP and at Chandigarh.

- **For Courses [MCA, MBA & MBA (T&HM)], [B.Sc. (HM&CT)]/BHMCT, M.Sc. Physics and M.Sc. Environmental Sciences**

The centers will be established in Hamirpur, Mandi, Kangra and Solan districts of HP.

However, creation of a center at a particular place will depend upon number of candidates opting for that place. The university reserves the right to change or cancel the center.

3.6 Display of Answer Key for Challenges

The answer key for the courses of HPCET-2025 will be made available on the H.P. Technical University website immediately after the conduct of HPCET-2025.

Candidates can forward their written complaints, *if any*, along with supporting documents / solution pertaining to question paper / answer key which must reach in the office of the Controller of Examinations, H.P. Technical University, Hamirpur (H.P.)-177001 within two days of conduct of respective examinations by 05:00 PM either personally or through e-mail at **coehimtu@gmail.com** and /or at **arconduct@gmail.com**. No complaint of any kind, in this regard, shall be entertained after the due date and time.

3.7 Procedure to Resolve a Tie, if any

To break the tie, if any, in ranking procedure if the candidates have scored the same aggregate marks in HPCET-2025 or qualifying examination, the following procedure will be adopted:

(a) B. Tech. and B. Pharmacy (Direct Entry):

(i) If two applicants have the same HPCET-2025 aggregate marks, the candidate with higher marks in Physics will be ranked above.

(ii) If the marks in Physics are same, the higher marks in Chemistry would break the tie.

(iii) If the marks in Physics and Chemistry are same, then the marks in third subject would eventually be same. The qualifying examination *i.e.*10+2 marks would break the tie and it will be done during counseling there and then if the qualifying examination marks are not available in the HPCET-2025 application form.

(iv) If the qualifying examination marks are also same then the date of birth of the applicants will be considered. Elder candidate shall get the benefit of being ranked above.

(b) B.Sc. (HM & CT)/BHMCT:

(i) If two applicants have the same HPCET-2025 aggregate marks, the candidate with higher marks in General English will be ranked above.

(ii) If the marks in General English are same, the higher marks in General Knowledge would break the tie.

(iii) If the marks in General English and General Knowledge are same, the higher marks in Reasoning would break the tie.

(iv) If the marks in General English, General Knowledge and Reasoning are same, the higher marks in Data Interpretation would break the tie.

(v) If the marks in General English General Knowledge Reasoning and Data Interpretation are same. The qualifying examination *i.e.*10+2 marks would break the tie and it will be done during counseling there and then if the qualifying examination marks are not available in the HPCET-2025 application form.

(vi) If the qualifying examination marks are also same then the date of birth of the applicants will be considered. Elder candidate shall get the benefit of being ranked above.

(c) MCA, MBA, MBA (T&HM) (Direct Entry):

(i) If two applicants have the same HPCET-2025 aggregate marks, the candidate with higher marks in Verbal Ability and Reading Comprehension will be ranked above.

(ii) If the marks in Verbal Ability and Reading Comprehension are same, then a higher Data

(iii) Interpretation and Logical Reasoning marks would break the tie.

(iv) If, the marks in Verbal Ability and Reading Comprehension, Data Interpretation and Logical Reasoning are same then a higher and Quantitative Ability marks would break the tie.

(v) If the marks in Verbal Ability & Reading Comprehension, Data Interpretation and Logical Reasoning and Quantitative Ability would be the same. Then the qualifying examination *i.e.*, graduation marks would break the tie and it will be done during counseling there and then if the qualifying examination marks are not available in the HPCET-2025 application form.

(vi) If the qualifying examination marks are also same then the date of birth of the applicants will be considered. Elder candidate shall get the benefit of being ranked above.

(d) M.Sc. Physics:

(i) If two applicants have the same HPCET-2025 aggregate marks, the candidate with higher marks in Mathematical methods, Classical mechanics and general properties of matter will be ranked above.

(ii) If the marks in Mathematical methods, Classical mechanics and general properties of matter are same, the higher marks in Optics, Electricity and magnetism would break the tie.

(iii) If the marks in Mathematical methods, Classical mechanics and general properties of matter and Optics, Electricity and magnetism are same, the higher marks in Modern Physics, Nuclear and Particle Physics would break the tie.

(iv) If the marks in Mathematical methods, Classical mechanics and general properties of matter, Optics, Electricity and magnetism, Modern Physics, Nuclear and Particle Physics are same, the higher marks in Atomic and Molecular, Kinetic Theory of gases and Thermodynamics, Solid state Physics and Electronics would break the tie.

(v) If the marks in Classical mechanics and general properties of matter, Optics, Electricity magnetism, Modern Physics, Nuclear and Particle Physics and Atomic and Molecular, Kinetic Theory of gases and Thermodynamics, Solid state Physics and Electronics are same, . The qualifying examination i.e. Graduation marks would break the tie and it will be done during counseling there and then if the qualifying examination marks are not available in the HPCET-2025 application form.

(vii) If the qualifying examination marks are also same then the date of birth of the applicants will be considered. Elder candidate shall get the benefit of being ranked above.

(e) M.Sc. Environmental Sciences:

(i) If two applicants have the same HPCET-2025 aggregate marks, the candidate with higher marks in Earth Sciences will be ranked above.

(ii) If the marks in Earth Sciences are same, the higher marks in Physical and Chemical Sciences would break the tie.

(iii) If the marks in Earth Sciences and 'Physical and Chemical Sciences' are same, the higher marks in Life Sciences would break the tie.

(iv) If the marks in Earth Sciences, 'Physical and Chemical Sciences' and Life Sciences are same. The qualifying examination *i.e.* Graduation marks would break the tie and it will be done during counseling there and then if the qualifying examination marks are not available in the HPCET-2025 application form.

(v) If the qualifying examination marks are also same then the date of birth of the applicants will be considered. Elder candidate shall get the benefit of being ranked above.

3. 8 Instructions for the Candidates to be adhered to during entrance test

(a) The Candidates are advised to bring with them a card board or a clipboard on which nothing should have been written) so that they have no difficulty in filling responses in the OMR sheet.

(b) Bring your own ball point pens (black/blue) of good quality.

(c) For aptitude test, candidates are advised to bring their own geometry box, pencils and erasers.

(d) Please check the e-admit card carefully for your name, centre allotted, place and category.

(e) The e-admit card is issued provisionally to the candidate subject to his/her fulfilling the prescribed eligibility conditions.

(f) The examination room / hall will be opened thirty minutes before the commencement of the examination/test. Candidates should take their seats immediately after opening of the 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.

(g) The candidate must show, on demand, the e-admit card and ID proof for admission in the examination room /hall. A candidate who does not possess the e-admit card duly electronically singed by Controller of Examinations shall not be permitted to appear in examination / test under any circumstances.

(h) Candidates shall maintain complete silence and attend to their question paper only. Any conversation or gesture or disturbance in the examination room/hall shall be deemed as misbehavior. If a candidate is found using unfair means or impersonating, his/her candidature shall be cancelled and he/she will be liable to be debarred for taking test either permanently or for a specified period according to the nature of offence.

(i) Candidates are not allowed to carry any textual material, calculators, document, slide rules, log tables, electronic watches with facilities of scientific calculator, printed or written material, bits of papers, mobile phone, pager or any other device, except the e-admit card, geometry box, pencils, erasers, card board or a clipboard and ball point pens (black/blue) inside the examination room / hall. If any candidate is in possession of any of the above items, his / her candidature will be treated as unfair means and his / her examination / test will be cancelled & he / she will also be debarred for future test(s) & the equipment will be seized.

(j) Candidates are advised to attempt only those subjects which he/she had filled in the application form. If a candidate attempts wrong subject combination, his/her candidature is liable to be cancelled and no correspondence shall be entertained in this regard.

(k) The candidate shall not remove any page(s) from the test booklet (in case of pen and paper based test) and if he/she is found to have removed any page(s) from his/her test booklet, he/she will be presumed to have used unfair means and shall be liable for criminal action.

(l) No candidate shall be allowed to carry any baggage inside the examination hall.

(m) No candidate, without the special permission of the Centre Superintendent or Invigilator concerned, will leave his/her seat or examination room until complete duration of examination.

(n) Use of electronic devices like mobile phone, calculator etc. is not permitted in the entrance examination. Materials like log table, book, notebook, etc. should not be brought in to the examination hall.

(o) The candidates are directed not to fold or mutilate the OMR sheet because these are to be checked by machine. Any OMR sheet, if found fold or mutilated, may not be scanned by the computer and result of such candidate shall not be declared.

(p) The candidate shall handover the OMR sheet to the Centre Supdt. /Assistant Superintendent/Invigilator on duty before leaving the examination hall. However, the candidates are allowed to carry question booklet along with them.

(q) For each question four alternate answers will be available. The candidate has to darken only one circle using black /blue ball pen as correct answer.

(r) The correct method of marking answers is indicated below:

(i) Each question will be followed by answers marked as (a), (b), (c) or (d).

Select the most appropriate answer. Then using ball point pens (black /blue) the circle bearing the correct answer index against the serial number of the question on the OMR sheet completely. For example, if the answer to question 2 is c, it is marked as follows:

Question 2: (a) (b) (c) (d)

(ii) Some wrong methods of marking an answer:

Please do not mark your answer or fill up information by using any of the following methods of marking

(Use of Tick Mark) ✓ (Use of Cross Mark)

(Half Filled Circle)  (Use of Dot) 

(iii) Please note that the mark should be dark enough and the circle should be filled in as completely as possible. You need not to make special efforts to darken any circle artistically.

Chapter4: Guidelines for Submission Of Online Application Form

Instructions for online submission

Steps to fill the HPCET-2025 Application Form:

1. Create your account by clicking on **create account** option available on the Login Page. HPCET-2025 Registration page will appear.

   (a) Fill all the required fields i.e. First Name, Last Name, email id, Date of Birth (DOB) and Mobile No.

   (b) After clicking on **Register** button, a new page having your credentials *i.e.,* User ID and Password will be displayed. The candidates are advised to note down their User ID and Password for future reference. The candidate will also get his/her login details on the registered email id.

2. The candidate must fill in the required information in the login page *i.e.,* User ID and Password received in their email id during registration process. After clicking on the login button, **"Basic Information"** page will open.
3. In the **"Basic Information"** Page fill all the required entries.
4. After clicking on **Next** button, "**Educational Information"** Page will open for opting the **Course, Examination City, Quota, Category, Subcategory** *etc.*
5. On the selection of **AIQ (All India Quota)** / **KM (Kashmiri Migrant)** under the option **Quota Under which Applied** dropdown list then only **GENERAL** Category will be displayed and if **HPSQ (Himachal Pradesh State Quota)** is selected then all Categories will be displayed *i.e.,* General/SC/ST/OBC/EWS as per State Govt. reservation policy. Additionally, for PG courses, the '**Kashmiri Migrant**' option will not be displayed in the **Quota Under which Applied** dropdown list.
6. After the selection of **Category** the applicable **Subcategory** options will be displayed.
7. On selection of subcategory, its pertaining subclass(s) list will be displayed. Candidate must click on the radio button displayed against the applicable subclass from the list.
8. Candidate has to fill the applicable Educational Qualification in ascending order *i.e.,* 10^{th}, 10+1, 10+2, Graduation as applicable.
9. After filling in the entire requisite details, the applicant must click on the **Next** button and he/she will be redirected to another page **"Documents"** for uploading Photograph, Signature and other required documents.
10. To upload Photograph, Signature and related documents, click on the **Browse** button. ***Note: The scanned images of Photograph, Signature and other related documents should be in .jpg/.jpeg /.png format only and their size must be less than 100 kb.***
11. After uploading all the required document, candidate must click on the **"I accept"** checkbox and then click on **Finish** button. Candidate will be redirected to the **"Application Preview"** page, where the candidate can view all the filled information/data.
12. By clicking on **"Edit"** button, the candidate can modify/change his/her information. If the data/information entered by the candidate are correct, click on the "**Pay"** button to make the fee payment of **"HPCET-2025 Application Form"**.

13. After this, the candidate will be redirected to the Payment Page, where he/she can make the fee payment through any payment option *i.e.*, Internet Banking, Credit/Debit Cards, UPI, *etc*. After successful payment, the candidate will be able to download/print the **"HPCET-2025 Application Form"**.
14. If the .PDF of the HPCET-2025 Application Form is not generated by the system after successful payment, the candidate has to wait for at least 2 working Days. After the verification of payment, the Candidate can download the .PDF of application form by login to their dashboard. After 2 working days, if .PDF is still not generated, the candidate may contact at technical helpline number: 01972-226914 or email at id: queryadmission@outlook.com along with the mandatory details including ***HPCET-2025 Application Form No, Transaction number, Transaction date and Payment proof.***
15. The multiple payments (if any) received by the University on the same HPCET-2025 application form number will be refunded at the end of the online form process. The candidate can download the refund form from the official website of H.P. Technical University and may send the filled refund form at email-id: finofficerhimtu@gmail.com. Candidate(s) can contact at 01972-226907 of HPTU finance branch for refund-related queries.
16. The admit cards for HPCET-2025 will be generated after the closure of HPCET-2025 Application Form.

Important Note:

- HPTU reserves the right to alter or modify the Information Brochure HPCET-2025.
- The Application Number printed on the computer-generated application form (PDF) must be mentioned in all the correspondence.
- For Technical queries, email at id: queryadmission@outlook.com or call at **01972-226914** up to the last date of closure of HPCET-2025 application form.
- Queries related to the Examination Centre, Admit Cards of HPCET-2025, conduct of the HPCET examination etc. should be addressed to the Controller of Examinations, Himachal Pradesh Technical University, Daruhi, Hamirpur (H.P.)–177001 at email-id: **arconduct@gmail.com**, **coehimtu@gmail.com** or call at **01972-226908/226910**.

HPCET-2025 Syllabus for B. Tech. and B. Pharmacy

PHYSICS

The syllabus contains two Sections – A and B. Section A pertains to the theory part having 80% weightage, while Section B contains the practical component (experimental skills), having 20% Weightage.

Unit 1: Physics and Measurement

Physics, technology, and society, S I Units, fundamental and derived units, least count, accuracy and precision of measuring instruments, Errors in measurement, Dimensions of Physics quantities, dimensional analysis, and its applications.

Unit 2: Kinematics

The frame of reference, motion in a straight line, Position- time graph, speed and velocity; Uniform and non-uniform motion, average speed and instantaneous velocity, uniformly accelerated motion, velocity-time, position-time graph, relations for uniformly accelerated motion, Scalars and Vectors, Vector. Addition and subtraction, zero vector, scalar and vector products, Unit Vector, Resolution of a Vector. Relative Velocity, Motion in a plane, Projectile Motion, Uniform Circular Motion.

Unit 3: Laws of Motion

Force and inertia, Newton's First law of motion; Momentum, Newton's Second Law of motion, Impulses; Newton's Third Law of motion. Law of conservation of linear momentum and its applications. Equilibrium of concurrent forces. Static and Kinetic friction, laws of friction, rolling friction. Dynamics of uniform circular motion: centripetal force and its applications.

Unit 4: Work, Energy and Power

Work done by a content force and a variable force; Kinetic and potential energies, Work-energy theorem, Power. The potential energy of spring conservation of mechanical energy, conservative and neoconservative forces; Elastic and inelastic collisions in one and two dimensions.

Unit 5: Rotational Motion

Centre of the mass of a two-particle system, Centre of the mass of a rigid body; Basic concepts of rotational motion; A moment of a force; Torque, Angular momentum, Conservation of angular momentumanditsapplications;Themomentofinertia,Theradiusofgyration. Values of moments of inertia for simple geometrical objects, Parallel and perpendicular axes theorems and their applications. Rigid body rotation equations of rotational motion.

Unit 6: Gravitation

The universal law of gravitation. Acceleration due to gravity and its variation with altitude and depth. Kepler's law of planetary motion. Gravitational potential energy; gravitational potential. Escape velocity, Orbital velocity of a satellite. Geo stationary satellites.

Unit 7: Properties of Solids and Liquids

Elastic behaviour, Stress-strain relationship, Hooke's Law. Young's modulus, bulk modulus, modulus of rigidity. Pressure due to a fluid column; Pascal's law and its applications. Viscosity. Stokes' law.

Terminal velocity, streamline and turbulent flow. Reynolds number. Bernoulli's principle and its applications. Surface energy and surface tension, angle of contact, application of surface tension – drops, bubbles and capillary rise. Heat, temperature, thermal expansion; Specific heat capacity, calorimetry; Change of state, latent heat. Heat transfer-conduction, convection and radiation. Newton's law of cooling.

Unit 8: Thermodynamics

Thermal equilibrium, Zeroth law of thermodynamics, The concept of temperature. Heat, work and internal energy. The first law of thermodynamics. The second law of thermodynamics: reversible and irreversible processes. Carnot engine and its efficiency.

Unit 9: Kinetic Theory of Gases

Equation of state of a perfect gas, work done on compressing a gas, Kinetic theory of gases – assumptions, the concept of pressure. Kinetic energy and temperature: RMS speed of gas molecules: Degrees of freedom. Law of equipartition of energy, Applications to specific heat capacities of gases; Mean free path. Avogadro's number.

Unit 10: Oscillations and Waves

Periodic motion – period, frequency, displacement as a function of time. Periodic functions. Simple harmonic motion (S.H.M.) and its equation; Phase: oscillations of a spring -restoring force and force constant: energy in S.H.M. – Kinetic and potential energies; Simple pendulum – derivation of expression for its time period: Free, forced and damped oscillations, resonance.

Wave motion. Longitudinal and transverse waves, speed of a wave. Displacement relation for a progressive wave. Principle of superposition of waves, a reflection of waves. Standing waves in strings and organ pipes, Fundamental mode and harmonics. Beats. Doppler Effect in sound.

Unit 11: Electrostatics

Electric charges: Conservation of charge. Coulomb's law-forces between two point charges, Forces between multiple charges: superposition principle and continuous charge distribution.

Electric field: Electric field due to a point charge, Electric field lines. Electric dipole, Electric field due to a dipole. Torque on a dipole in a uniform electric field.

Electric flux. Gauss's law and its applications to find field due to infinitely long uniformly charged straight wire, uniformly charged infinite plane sheet and uniformly charged thin spherical shell. Electric potential and its calculation for a point charge, electric dipole and system of charges; Equipotential surfaces, Electrical potential energy of a system of two point charges in an electrostatic field.

Conductors and insulators. Dielectrics and electric polarization, Capacitor, The combination of capacitors in series and parallel, Capacitance of a parallel plate capacitor with and without dielectric medium between the plates. Energy stored in a capacitor.

Unit 12: Current Electricity

Electric current. Drift velocity. Ohm's law. Electrical resistance. Resistances of different materials. V-l characteristics of Ohmic and non-ohmic conductors. Electrical energy and power. Electrical resistivity. Colour code for resistors; Series and parallel combinations of resistors; Temperature dependence of resistance.

Electric cell and its Internal resistance, Potential difference and emf of a cell, A combination of cells in series and parallel. Kirchhoff's laws and their applications. Wheatstone bridge. Metre Bridge. Potentiometer – principle and its applications.

Unit 13: Magnetic Effects of Current and Magnetism

Biot–Savart law and its application to current carrying circular loop. Ampere's law and its applications to infinitely long current carrying straight wire and solenoid. Force on a moving charge in uniform magnetic and electric fields. Cyclotron.

Force on a current-carrying conductor in a uniform magnetic field. The 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 and conversion to ammeter and voltmeter.

Current loop as a magnetic dipole and its magnetic dipole moment. Bar magnet as an equivalent solenoid, Magnetic field lines; Earth's magnetic field and magnetic elements. Para-, dia- and ferromagnetic substances. Magnetic susceptibility and permeability. Hysteresis. Electromagnets and permanent magnets.

Unit 14: Electromagnetic Induction and Alternating Currents

Electromagnetic induction: Faraday's law. Induced emf and current: Lenz's Law, Eddy currents. Self and mutual inductance. Alternating currents, peak and RMS value of alternating current/voltage: Reactance and impedance: LCR series circuit, resonance: Quality factor, power in AC circuits, wattless current. AC generator and transformer.

Unit 15: Electromagnetic Waves

Electromagnetic waves and their characteristics, Transverse nature of electromagnetic waves, Electromagnetic spectrum (radio waves, microwaves, infrared, visible, ultraviolet. X-rays. Gamma rays), Applications of e. m. waves.

Unit 16: Optics

Reflection and refraction of light at plane and spherical surfaces, mirror formula. Total internal reflection and its applications. Deviation and dispersion of light by a; prism; Lens formula. Magnification. Power of a lens. Combination of thin lenses in contact. Microscope and astronomical telescope (reflecting and refracting) and their magnifying powers.

Unit 17: Dual Nature of Matter and Radiation

Photoelectric effect, Hertz and Lenard's observations; Einstein's photoelectric equation- particle nature of light. Matter waves- wave nature of particles, de Broglie relation. Davisson-Germer experiment (experimental details should be omitted; only conclusion should be explained).

UNIT 18: Atoms and Nuclei

Alpha- particle scattering experiments; Rutherford's model of atom; Bohr model, energy levels, hydrogen spectrum. Composition and size of nucleus, atomic masses, isotopes, isobars; isotones. Radioactivity- alpha, beta and gamma particles/ rays and their properties decay law. Mass-energy relation, mass defect; binding energy per nucleon and its variation with mass number, nuclear fission and fusion.

UNIT 19: Electronic Devices

Energy bands in solids (qualitative ideas only), conductors, insulators and semiconductors; semiconductor diode- I-V characteristics in forward and reverse bias, diode as a rectifier; I-V characteristics of LED, photodiode, solar cell, and Zener diode; Zener diode as a voltage regulator. Junction transistor, transistor action, characteristics of a transistor; transistor as an amplifier (common emitter configuration) and oscillator. Logic gates(OR,AND,NOT,NAND and NOR). Transistor as a switch.

UNIT 20: Communication Systems

Propagation of electromagnetic waves in the atmosphere: Sky and space wave propagation, Need for modulation. Amplitude and Frequency Transmission medium, Basic Elements of a Communication System (Block Diagram only).

UNIT 21: Experimental Skill

1. Vernier calliper, its use to measure external and internal diameter and depth of a given vessel.
2. Screw gauge and its use to determine the diameter/thickness of thin sheet/wire.
3. Simple Pendulum-All the dissipation of energy by plotting a graph between square of amplitude versus time.
4. Metre Scale: Calculate the mass of the given object by principle of moments.
5. Young's modulus of elasticity of the material used in the metallic wire.
6. The surface tension of water by using capillary rise and effect of detergents on it.
7. Calculation of Coefficient of the viscosity of a given viscous liquid by measuring the terminal velocity of a spherical body.
8. Plotting a cooling curve between the temperatures of a hot body versus time.
9. Calculate the speed of sound in air at room temperature using a resonance tube.
10. Specific heat capacity of a given (i) solid and (ii) liquid by method of mixtures.
11. Find the resistivity of the material of a given wire using metre bridge.
12. Calculate the resistance of a given wire using Ohm's law.
13. Potentiometer-
    a) Comparison between emf of two primary cells.
    b) Determination of the internal resistance of the given cell.
14. Calculate the resistance and figure of merit of a galvanometer by half deflection method,
15. The focal length of the optical equipment by using the parallax method:
    a) Convex mirror
    b) Concave mirror, and
    c) Convex lens
16. Plot the graph between angle of deviation vs angle of incidence for a given triangular prism.
17. Calculate the refractive index of a glass slab using a traveling microscope.
18. Characteristic curves of a p-n junction diode in reverse and forward bias.
19. Characteristic curves of Zener diode and finding reverse break-down voltage.
20. Characteristic curves of the transistor and finding current gain and voltage gain.
2I. Identification of Diodes, Transistor, LED, IC, Capacitor, Resistor from mixed collection of such items.
22. Using a millimeter to:
    (i) Identify the base of a transistor.
    (ii) Distinguish between n-p-n and p-n-p type transistor
    (iii) See the unidirectional flow of current in case of a LED and a Diode.
    (iv) Check the correctness or otherwise of a given electronic component (Transistor, Diode or IC)

CHEMISTRY

Section-A: Physical Chemistry

Unit 1 Some Basic Concepts of Chemistry:

- Matter and its nature, Dalton's atomic theory, the concept of the atom, molecule, element, and compound.
- Physical quantities and their measurements in Chemistry, precision, and accuracy, significant figures, S.I. Units, dimensional analysis.
- Laws of chemical combination.
- Atomic and molecular masses, mole concept, molar mass, percentage composition, empirical and molecular formulae.
- Chemical equations and stoichiometry.

Unit 2 States of Matter:

- Classification of matter into solid, liquid and gaseous states.
- Gaseous State: Measurable properties of gases; Gas laws–Boyle's law, Charles's law, Graham's law of diffusion, Avogadro's law, Dalton's law of partial pressure.
- The concept of the absolute scale of temperature; Ideal gas equation, kinetic theory of gases (only postulates).
- The concept of average, root mean square and most probable velocities.
- Real gases, deviation from Ideal behaviour, compressibility factor, van der Waals equation, liquefaction of gases, critical constants.
- Liquid State: Properties of liquids –vapour pressure, viscosity and surface tension and effect of temperature on them (qualitative treatment only).
- Solid State: Classification of solids-molecular, ionic, covalent and metallic solids, amorphous and crystalline solids (elementary idea).
- Bragg's Law and its applications.
- Unit cell and lattices, packing in solids (fcc, bcc and hcp lattices), voids, calculations involving unit cell parameters, imperfections in solids.
- Electrical, magnetic and dielectric properties.

Unit 3 Atomic Structure:

- Thomson and Rutherford atomic models and their limitations.
- Nature of electromagnetic radiation, photoelectric effect.
- The spectrum of the hydrogen atom, Bohr model of hydrogen atom – its postulates, derivation of the relations for the energy of the electron and radii of the different orbits, limitations of Bohr's model.
- Dual nature of matter,de-Broglie relationship, Heisenberg uncertainty principle.
- Elementary ideas of quantum mechanics, the quantum mechanical model of an atom, its important features, the concept of atomic orbitals as one-electron wave functions.
- Variation of Ψ1 and Ψ2 with r for1s and 2s orbitals; various quantum numbers (principal, Angular momentum, and magnetic quantum numbers),and their significance.
- Shapes of s,p and d–orbitals, electron spin and spin quantum number.
- Rules for filling electrons in orbitals – Aufbau principle, Pauli exclusion principle and Hund's rule, electronic configuration of elements, the extra stability of half-filled and completely filled orbitals.

Unit 4 Chemical Bonding and Molecular Structure:

- Kossel– Lewis approach to chemical bond formation, the concept of ionic and covalent bonds.
- Ionic Bonding: Formation of ionic bonds, factors affecting the formation of ionic bonds; calculation of lattice enthalpy.
- Covalent Bonding: Concept of electronegativity, Fajan's rule, dipole moment; Valence Shell Electron Pair Repulsion (VSEPR) theory and shapes of simple molecules.
- Quantum mechanical approach to covalent bonding: Valence bond theory, Its important features, the concept of hybridization involving s, p, and d orbitals; Resonance.
- Molecular Orbital Theory: Its important features, LCAOs, types of molecular orbitals (bonding, anti bonding), sigma and pi-bonds, molecular orbital electronic configurations of homonuclear diatomic molecules, the concept of bond order, bond length and bond energy.
- Elementary idea of metallic bonding, Hydrogen bonding, and its applications.

Unit 5 Chemical Thermodynamics:

- Fundamentals of thermodynamics: System and surroundings, extensive and intensive properties, state functions, types of processes.
- First law of thermodynamics: Concept of work, heat internal energy, and enthalpy, heat capacity, molar heat capacity
- Hess's law of constant heat summation.
- Enthalpies of bond dissociation, combustion, formation, atomization, sublimation, phase transition, hydration, ionization, and solution.
- The second law of thermodynamics: Spontaneity of processes; Delta S of the universe and Delta G of the system as criteria for spontaneity, Delta G^o (Standard Gibbs energy change) and equilibrium constant.

Unit 6 Solutions:

- Different methods for expressing the concentration of a solution: molality, molarity, mole fraction, percentage (by volume and mass both), the vapour pressure of solutions and Raoult's Law.
- Ideal and non-ideal solutions, vapour pressure – composition, plots for ideal and non-ideal solutions.
- Colligative properties of dilute solutions, relative lowering of vapour pressure, depression of freezing point, elevation of boiling point and osmotic pressure.
- Determination of molecular mass using colligative properties.
- Abnormal value of molar mass, Hoff factor, and its significance.

Unit 7 Equilibrium:

- Meaning of equilibrium, the concept of dynamic equilibrium.
- Equilibria involving physical processes: Solid-liquid, liquid – gas and solid-gas equilibria, Henry's law, a general characteristic of equilibrium involving physical processes.
- Equilibria involving chemical processes: Law of chemical equilibrium, equilibrium constants (Kp and Kc) and their significance, the significance of Delta G and Delta Go in chemical equilibria, factors affecting equilibrium concentration, pressure, temperature, the effect of the catalyst.
- Le Chatelier's principle.
- **Ionic equilibrium:** Weak and strong electrolytes, ionization of electrolytes, various concepts

of acids and bases (Arrhenius, Bronsted-Lowry and Lewis) and their ionization, acid-base equilibria (including multistage ionization) and ionization constants, ionization of water, pH scale, common ion effect, hydrolysis of salts and pH of their solutions, solubility of sparingly soluble salts and solubility products, buffer solutions.

Unit 8 Redox Reactions and Electrochemistry:

- Electronic concepts of oxidation and reduction, redox reactions, oxidation number, rules for assigning oxidation number, balancing of redox reactions.
- Electrolytic and metallic conduction, conductance in electrolytic solutions, specific and molar conductivities and their variation with concentration.
- Kohlrausch's law and its applications.
- Electrochemical cells: Electrolytic and Galvanic cells, different types of electrodes, electrode potentials including standard electrode potential, half-cell and cell reactions, emf of a Galvanic cell and its measurement.
- Nernst equation and its applications; Relationship between cell potential and Gibbs' energy change.
- Dry cell and lead accumulator, fuel cells.

Unit 9 Chemical Kinetics:

- The rate of a chemical reaction, factors affecting the rate of reactions: concentration, temperature, pressure, and catalyst.
- Elementary and complex reactions, order and molecularity of reactions, rate law, rate constant and its units, differential and integral forms of zero and first-order reactions, their characteristics and half-lives, the effect of temperature on the rate of reactions.
- Arrhenius theory, activation energy and its calculation, collision theory of bimolecular gaseous reactions (no derivation).

Unit 10 Surface Chemistry:

- **Adsorption:** Physisorption and chemisorption and their characteristics, factors affecting the adsorption of gases on solids: Freundlich and Langmuir adsorption isotherms, adsorption from solutions.
- **Catalysis:** Homogeneous and heterogeneous, activity and selectivity of solid catalysts, enzyme catalysis, and its mechanism.
- **Colloidal state:** Distinction among true solutions, colloids, and suspensions, classification of colloids: lyophilic, lyophobic.
- Multimolecular, macromolecular and associated colloids (micelles), preparation and properties of colloids: Tyndall effect, Brownian movement, electrophoresis, dialysis, coagulation, and flocculation.
- Emulsions and their characteristics.

Section-B: Organic Chemistry

Unit 11 Classification of Elements and Periodicity in Properties:

- Modern periodic law and present form of the periodic table.
- s, p, d and f block elements.
- Periodic trends in properties of elements atomic and ionic radii, ionization enthalpy.
- Electron gain enthalpy, valence, oxidation states and chemical reactivity.

Unit 12 General Principles and Process of Isolation of Metals:

- Modes of occurrence of elements in nature, minerals, ores.
- Steps involved in the extraction of metals: concentration, reduction (chemical and electrolytic methods) and refining with special reference to the extraction of Al, Cu, Zn, and Fe.
- Thermodynamic and electrochemical principles involved in the extraction of metals.

Unit 13 Hydrogen:

- The position of hydrogen in periodic table, isotopes, preparation, properties, and uses of hydrogen.
- Physical and chemical properties of water and heavy water.
- Structure, preparation, reactions, and uses of hydrogen peroxide.
- Classification of hydrides :ionic ,covalent and interstitial.
- Hydrogen as a fuel.

Unit 14 S Block Elements (Alkali and Alkaline Earth Metals):

- **Group 1 and Group 2 Elements:** General introduction, electronic configuration and general trends in physical and chemical properties of elements, anomalous properties of the first element of each group, diagonal relationships.
- **Preparation and properties of some important compounds: S**odium carbonate, sodium chloride, sodium hydroxide and sodium hydrogen carbonate.
- Industrial uses of lime, limestone, Plaster of Paris and cement.
- The biological significance of Na, K, Mg and Ca.

Unit 15 P Block Elements:

- **Group 13 to Group 18 Elements:** General introduction, electronic configuration, and general trends in physical and chemical properties of elements across the periods and down the groups; unique behaviour of the first element in each group. Groupwise study of the p block elements.
- **Group 13:** Preparation, properties, and uses of boron and aluminium; Structure, properties and uses of borax, boric acid, diborane, boron trifluoride, aluminium chloride, and alums.
- **Group 14:** Tendency for catenation; Structure, properties, and uses of allotropes and oxides of carbon, silicon tetrachloride, silicates, zeolites, and silicones.
- **Group 15:** Properties and uses of nitrogen and phosphorus; Allotropic forms of phosphorus; Preparation, properties, structure, and uses of ammonia, nitric acid, phosphine and phosphorus halides, (PCl3, PCl5); Structures of oxides and oxoacids of nitrogen and phosphorus.
- **Group 16:** Preparation, properties, structures and uses of dioxygen and ozone; Allotropicformsofsulphur;Preparation,properties,structures,andusesofsulphurdioxide,sulphuricacid (including its industrial preparation); Structures of oxoacids of sulphur.
- **Group 17:** Preparation, properties, and uses of chlorine and hydrochloric acid; Trends in the acidic nature of hydrogen halides; Structures of Interhalogen compounds and oxides and oxyacids of halogens.
- **Group 18:** Occurrence and uses of noble gases; Structures of fluorides and oxides of xenon.

Unit 16 D and F Block Elements:

- **Transition Elements:** General introduction, electronic configuration, occurrence and characteristics, general trends in properties of the first-row transition elements: physical properties, ionization enthalpy, oxidation states, atomic radii, colour, catalytic behaviour, magnetic properties, complex formation, interstitial compounds, alloy formation.

- Preparation, properties, and uses of K2Cr2O7 and KMnO4.
- **Inner Transition Elements:** Lanthanides, Electronic configuration, oxidation states, chemical reactivity and lanthanoid contraction, and Actinoids: Electronic configuration and oxidation states

Unit 17 Coordination Compounds:

- Introduction to coordination compounds, Werner's theory.
- ligands, coordination number, denticity, chelation.
- IUPAC nomenclature of mononuclear coordination compounds, isomerism.
- Bonding-Valence bond approach and basic ideas of Crystal field theory, colour and magnetic properties.
- Importance of coordination compounds (in qualitative analysis, extraction of metals and in biological systems).

Unit 18 Environmental Chemistry:

- **Environmental pollution:** Atmospheric, water, and soil.
- **Atmospheric pollution:** Tropospheric and stratospheric.
- **Gaseous pollutants:** Oxides of carbon, nitrogen, and sulphur, hydrocarbons; their sources, harmful effects, and prevention.
- Greenhouse effect and Global warming, acid rain.
- **Particulate pollutants:** Smoke, dust, smog, fumes, mist; their sources, harmful effects, and prevention.
- **Stratospheric pollution:** Formation and breakdown of ozone, depletion of ozone layer its mechanism and effects.
- **Water Pollution:** Major pollutants such as pathogens, organic wastes, and chemical pollutants; their harmful effects and prevention.
- **Soil pollution:** Major pollutants such as pesticides (insecticides, herbicides and fungicides) their harmful effects and prevention.
- Strategies to control environmental pollution.

Section-C: Organic Chemistry

Unit 19: Purification and Characterisation of Organic Compounds

- **Purification:** Crystallization, sublimation, distillation, differential extraction, and chromatography principles and their applications.
- **Qualitative analysis:** Detection of nitrogen, sulphur, phosphorus, and halogens.
- Quantitative analysis (basic principles only): Estimation of carbon, hydrogen, nitrogen, halogens, sulphur, phosphorus.
- Calculations of empirical formula and molecular formulae; Numerical problems in organic quantitative analysis.

Unit 20: Some Basic Principles of Organic Chemistry

- Tetravalency of carbon; Shapes of simple molecules–hybridization (s and p).
- Classification of organic compounds based on functional groups: -C= C-and those containing halogens, oxygen, nitrogen, and sulphur; Homologous series.
- **Isomerism:** structural and stereoisomerism.
- Nomenclature (Trivial and IUPAC): Covalent bond fission Homolytic and heterolytic: free

radicals, carbocations, and carbanions; stability of carbocations and free radicals, electrophiles and nucleophiles.

- Electronic displacement in a covalent bond: Inductive effect, electromeric effect, resonance, and hyperconjugation.
- Common types of organic reactions: Substitution, addition, elimination, and rearrangement.

Unit 21: Hydrocarbons

- Classification, isomerism, IUPAC nomenclature, general methods of preparation, properties and reactions.
- **Alkanes:** Conformations; Sawhorse and Newman projections (of ethane); Mechanism of halogenation of alkanes.
- **Alkenes:** Geometrical isomerism.
- Mechanism of electrophilic addition: addition of hydrogen, halogens, water, hydrogen halides (Markownikoff's and peroxide effect); Ozonolysis, oxidation, and polymerization.
- **Alkynes:** Acidic character; Addition of hydrogen, halogens, water and hydrogenhalides; Polymerization.
- **Aromatic hydrocarbons:** Nomenclature, benzene structure and aromaticity.
- Mechanism of electrophilic substitution: halogenation, nitration, Friedel-Crafts alkylation and acylation, directive influence of the functional group in monosubstituted benzene.

Unit 22: Organic Compounds Containing Halogens

- General methods of preparation, properties, and reactions.
- Nature of C-X bond.
- Mechanisms of substitution reactions.
- Uses, Environmental effects of chloroform, iodoform, freons, and DDT.

Unit 23: Organic Compounds Containing Oxygen

- General methods of preparation, properties, reactions and uses.
- **Alcohols :** Identification of primary, secondary and tertiary alcohols; mechanism of dehydration.
- **Phenols:** Acidic nature, electrophilic substitution reactions: halogenation, nitration, and sulphonation, Reimer Tiemann reaction.
- **Ethers:** Structure.
- **Aldehyde and Ketones:** Nature of carbonyl group; Nucleophilic addition to >C=O group, relative reactivities of aldehydes and ketones.
- Important reactions such as nucleophilic addition reactions (addition of HCN, NH3 and its derivatives), Grignard reagent; oxidation; reduction (Wolff Kishner and Clemmensen); the acidity of hydrogen, aldol condensation, Cannizzaro reaction, Haloform reaction.
- Chemical tests to distinguish between aldehydesand ketones.
- **Carboxylic Acids:** Acidic strength and factors affecting it.

Unit 24: Organic Compounds Containing Nitrogen

- General methods of preparation, properties, reactions, and uses.
- **Amines:** Nomenclature, classification, structure, basic character and identification of primary, secondary and tertiary amines and their basic character.

- **Diazonium Salts:** Importance in synthetic organic chemistry.

Unit 25: Polymers

- General introduction and classification of polymers, general methods of polymerization addition and condensation, co-polymerization.
- Natural and synthetic rubber and vulcanization.
- Some important polymers with emphasis on their monomers and uses, polyethene, nylon, polyester, and bakelite.

Unit 26: Biomolecules

- General introduction and importance of biomolecules.
- **Carbohydrates:** Classification: aldoses and ketoses; monosaccharides (glucose and fructose), constituent monosaccharides or oligosaccharides (sucrose, lactose, maltose) and polysaccharides (starch, cellulose, glycogen).
- **Proteins:** Elementary Idea of amino acids, peptide bond, polypeptides; Proteins: primary, secondary, tertiary and quaternary structure (qualitative idea only), denaturation of proteins, enzymes.
- **Vitamins:** Classification and functions.
- Nucleic Acids – Chemical constitution of DNA and RNA. Biological functions of nucleic acids.

Unit 27: Chemistry in Everyday Life

- **Chemicals in medicines:** Analgesics, tranquillizers, antiseptics, disinfectants, antimicrobials, antifertility drugs, antibiotics, antacids, antihistamines their meaning and common examples.
- **Chemicals in food:** Preservatives, artificial sweetening agents–common examples.
- **Cleansing agents:** Soaps and detergents, cleansing action.

Unit 28: Principles Related to Practical Chemistry

- Detection of extra elements (Nitrogen, Sulphur, halogens) inorganic compounds.
- **Detection of the following functional groups:** hydroxyl (alcoholic and phenolic), carbonyl (aldehyde and ketone), carboxyl and amino groups in organic compounds.
- **The chemistry involved in the preparation of the following:** Inorganic compounds: Mohr's salt, potash alum, and organic compounds: Acetanilide, p-nitro acetanilide, aniline yellow, iodoform.
- **The chemistry involved in the titrimetric exercises:** Acids bases and the use of indicators, oxalic-acid vs KMnO4, Mohr's salt vs $KMnO_4$.
- **Chemical principles involved in the qualitative salt analysis:** Cations: Pb^{2+}, Cu^{2+}, AI^{3+}, Fe^{3+}, Zn^{2+}, Ni^{2+}, Ca^{2+}, Ba^{2+}, Mg^{2+}, NH_4^+, and Anions: CO_3^{2-}, S^{2-}, SO^{2-}_4 NO^{2-}, NO_3^-, CI^-, Br^-, I^-(Insoluble salt sexcluded).
- **Chemical principles involved in the following experiments:** Enthalpy of solution of CuSO4, Enthalpy of neutralisation of strong acid and strong base, Preparation of lyophilic and lyophobic sols, and Kinetic study of the reaction of iodide ion with hydrogen peroxide at room temperature.

MATHEMATICS

1. **Sets, Relations and Functions:**

   Sets and their representation; Union, intersection and complement of sets and their algebraic properties; Power set; Relation, Types of relations, equivalence relations, functions; one-one, into and onto functions, composition of functions,

2. **Complex Numbers and Quadratic Equations:**

   Complex numbers as ordered pairs of reals, Representation of complex numbers in the form a+b and their representation in aplane, Argand diagram, algebra of complex numbers, modulus and argument (or amplitude) of a complex number, square root of a complex number, triangle inequality, Quadratic equations in real and complex number system and their solutions. Relation between roots and co-efficients, nature of roots, formation of quadratic equations with given roots.

3. **Matrices and Determinants:**

   Matrices, algebra of matrices, types of matrices, determinants and matrices of order two and three. Properties of determinants, evaluation of determinants, area of triangles using determinants. Adjoint and evaluation of inverse of a square matrix using determinants and elementary transformations, Test of consistency and solution of simultaneous linear equations in two or three variables using determinants and matrices.

4. **Permutations And Combinations:**

   Fundamental principle of counting, permutation as an arrangement and combination as selection, Meaning of P (n,r) and C (n,r), simple applications.

5. **Mathematical Induction:**

   Principle of Mathematical Induction and its simple applications.

6. **Binomial Theorem and its Simple Applications:**

   Binomial theorem for a positive integral index, general term and middle term, properties of Binomial coefficients and simple applications.

7. **Sequences and Series:**

   Arithmetic and Geometric progressions, insertion of arithmetic, geometric means between two given numbers. Relation between A.M. and G.M. Sum upto n terms of special series: S n, S n2, Sn3. Arithmetico-Geometric progression.

8. **Limit, Continuity and Differentiability:**

   Real - valued functions, algebra of functions, polynomials, rational, trigonometric, logarithmic and exponential functions, inverse functions. Graphs of simple functions. Limits, continuityand differentiability. Differentiation of the sum, difference, product and quotient of two functions. Differentiation of trigonometric, inverse trigonometric, logarithmic, exponential, composite and implicit functions; derivatives of order up to two. Rolle's and Lagrange's Mean Value Theorems. Applications of derivatives: Rate of change of quantities, monotonic - increasing and decreasing functions, Maxima and minima of functions of one variable, tangents, and normals.

9. **Integral Calculus:**

   Integral as an anti-derivative, Fundamental integrals involving algebraic, trigonometric, exponential and logarithmic functions. Integration by substitution, by parts, and by partial fractions. Integration using trigonometric identities.

Integral as limit of a sum. Fundamental Theorem of Calculus. Properties of definite integrals. Evaluation of definite integrals, determining areas of the regions bounded by simple curves in standard form.

10 **Differential Equations:**

Ordinary differential equations, their order and degree. Formation of differential equations. Solution of differential equations by the method of separation of variables, solution of homogeneous and linear differential equations.

11 **Co-ordinate Geometry:**

Cartesian system of rectangular co-ordinates 10 in a plane, distance formula, section formula, locus and its equation, translation of axes, slope of a line, parallel and perpendicular lines, intercepts of a line on the coordinate axes.

Straight lines

Various forms of equations of a line, intersection of lines, angles between two lines, conditions for concurrence of three lines, distance of a point from a line, equations of internal and external bisectors of angles between two lines, coordinates of centroid, orthocentre and circumcentre of a triangle, equation of family of lines passing through the point of intersection of two lines.

Circles, conic sections

Standard form of equation of a circle, general form of the equation of a circle, its radius and centre, equation of a circle when the end points of a diameter are given, points of intersection of a line and a circle with the centre at the origin and condition for a line to be tangent to a circle, equation of the tangent. Sections of cones, equations of conic sections (parabola, ellipse and hyperbola) in standard forms, condition for $y = mx + c$ to be a tangent and point (s) of tangency.

12 **Three Dimensional Geometry:**

Coordinates of a point in space, distance between two points, section formula, direction ratios and direction cosines, angle between two intersecting lines. Skew lines, the shortest distance between them and its equation. Equations of a line and a plane in different forms, inter section of a line and a plane, coplanar lines.

13 **Vector Algebra:**

Vectors and scalars, addition of vectors, components of a vector in two dimensions and three-dimensional space, scalar and vector products, scalar and vector triple product.

14 **Statistics and Probability:**

Measures of Dispersion: Calculation of mean, median, mode of grouped and ungrouped data calculation of standard deviation, variance and mean deviation for grouped and ungrouped data. Probability: Probability of an event, addition and multiplication theorems of probability, Baye's theorem, probability distribution of a random variate, Bernoulli trials and Binomial distribution.

15 **Trigonometry:**

Trigonometrical identities and equations. Trigonometrical functions. Inverse trigonometrical functions and their properties. Heights and Distances.

16 **Mathematical Reasoning:**

Statements, logical operations and/or implies, implied by, if and only if. Understanding of tautology, contradiction, converse and contrapositive.

BIOLOGY

CONTENTS OF CLASS XI SYLLABUS

UNIT I: DIVERSITY IN LIVING WORLD:

What is living?; Biodiversity; Need for classification; Three domains of life; Taxonomy & Systematics; Concept of species and taxonomical hierarchy; Binomial nomenclature; Tools for study of Taxonomy – Museums, Zoos, Herbaria, Botanical gardens.

Five kingdom classification; salient features and classification of Monera; Protista and Fungi into major groups; Lichens; Viruses and Viroids.

Salient features and classification of plants into major groups-Algae, Bryophytes, Pteridophytes, Gymnosperms and Angiosperms (three to five salient and distinguishing features and at least two examples of each category); Angiosperms- classification up to class, characteristic features and examples).

Salient features and classification of animals- nonchordate up to phyla level and chordate up to classes level (three to five salient features and at least two examples).

UNIT II: STRUCTURAL ORGANISATION IN ANIMALS AND PLANTS:

Morphology and modifications; Tissues; Anatomy and functions of different parts of flowering plants: Root, stem, leaf, inflorescence- cymose and racemose, flower, fruit and seed (To be dealt along with the relevant practical of the Practical Syllabus).

Animal tissues; Morphology, anatomy and functions of different systems (digestive, circulatory, respiratory, nervous and reproductive) of an insect (cockroach). (Brief account only)

UNIT III: CELL STRUCTURE AND FUNCTION:

Cell theory and cell as the basic unit of life; Structure of prokaryotic and eukaryotic cell; Plant cell and animal cell; Cell envelope, cell membrane, cell wall; Cell organelles-structure and function; Endomembrane system-endoplasmic reticulum, Golgi bodies, lysosomes, vacuoles; mitochondria, ribosomes, plastids, micro bodies; Cytoskeleton, cilia, flagella, centrioles (ultra structure and function); Nucleus-nuclear membrane, chromatin, nucleolus.

Chemical constituents of living cells: Biomolecules- structure and function of proteins, carbodydrates, lipids, nucleic acids; Enzymes-types, properties, enzyme action.

B Cell division: Cell cycle, mitosis meiosis and their significance.

UNIT IV: PLANT PHYSIOLOGY:

Transport in plants: Movement of water, gases and nutrients; Cell to cell transport-Diffusion, facilitated diffusion, active transport; Plant–water relations–Imbibition, waterpotential, osmosis, plasmolysis; Long distance transport of water – Absorption, apoplast, symplast, transpiration pull, root pressure and guttation; Transpiration-Opening and closing of stomata; Uptake and translocation Of mineral nutrients-Transport of food, phloem transport, Mass flow hypothesis; Diffusion of gases (brief mention).

Mineral nutrition: Essential minerals, macro and micronutrients and their role; Deficiency symptoms; Mineral toxicity; Elementary idea of Hydroponics as a method to study mineral nutrition;

Nitrogen metabolism-Nitrogen cycle, bio logical nitrogen fixation.

Photosynthesis: Photosynthesis as a means of Autotrophic nutrition; Site of photosynthesis take place; pigments involved in Photosynthesis (Elementary idea); Photochemical and biosynthetic phases of photosynthesis; Cyclic and non cyclic and photophosphorylation; Chemiosmotic hypothesis; Photorespiration C3 and C4 pathways; Factors affecting photosynthesis.

Respiration: Exchange gases; Cellular respiration- glycolysis, fermentation (anaerobic), TCA cycle and electron transport system (aerobic); Energy relations- Number of ATP molecules generated; Amphibolic pathways; Respiratory quotient.

Plant growth and development: Seed germination; Phases of Plant growth and plant growth rate; Conditions of growth; Differentiation, dedifferentiation and re differentiation; Sequence of developmentalprocessinaplantcell;Growthregulators-auxin,gibberellin,cytokinin,ethylene, ABA; Seed dormancy; Vernalisation; Photoperiodism.

UNIT V: HUMAN PHYSIOLOGY:

Digestion and absorption; Alimentary canal and digestive glands; Role of digestive enzymes and gastrointestinal hormones; Peristalsis, digestion, absorption and assimilation of proteins, carbohydrates and fats; Caloric value of proteins, carbohydrates and fats; Egestion; Nutritional and digestive disorders – PEM, indigestion, constipation, vomiting, jaundice, diarrhea.

Breathing and Respiration: Respiratory organs in animals (recall only); Respiratory system in humans; Mechanism of breathing and its regulation in humans-Exchange of gases, transport of gases and regulation of respiration Respiratory volumes; Disorders related to respiration-Asthma, Emphysema, Occupational respiratory disorders.

Body fluids and circulation: Composition of blood, blood groups, coagulation of blood; Composition of lymph and its function; Human circulatory system-Structure of human heart and blood vessels; Cardiac cycle, cardiac output, ECG, Double circulation; Regulation of cardiac activity; Disorders of circulatory system -Hypertension, Coronary artery disease, Angina pectoris, Heart failure.

Excretory products and their elimination: Modes of excretion- Ammonotelism, ureotelism, uricotelism; Human excretory system-structure and fuction; Urine formation, Osmoregulation; Regulationofkidneyfunction-Renin-angiotensin,AtrialNatriureticFactor,ADHandDiabetes insipidus; Role of other organs in excretion; Disorders; Uraemia, Renal failure, Renal calculi, Nephritis; Dialysis and artificial kidney.

Locomotion and Movement: Types of movement- ciliary, fiagellar, muscular; Skeletal musclecontractile proteins and muscle contraction; Skeletal system and its functions (To be dealt with the relevant practical of Practical syllabus); Joints; Disorders of muscular and skeletal system- Myasthenia gravis, Tetany, Muscular dystrophy, Arthritis, Osteoporosis, Gout.

Neural control and coordination: Neuron and nerves; Nervous system in humans- central nervous system,peripheralnervoussystemandvisceralnervoussystem;Generationandconductionof nerve impulse; Reflex action; Sense organs; Elementary structure and function of eye and ear.

Chemical coordination and regulation: Endocrine glands and hormones; Human endocrine system-Hypothalamus, Pituitary, Pineal, Thyroid, Parathyroid, Adrenal, Pancreas, Gonads; Mechanism of hormone action (Elementary Idea); Role of hormones as messengers and regulators, Hypo-and hyperactivity and related disorders (Common disorders e.g. Dwarfism, Acromegaly, Cretinism, goiter, exopthalmic goiter, diabetes, Addison's disease).

(*Important: Diseases and disorders mentioned above to be dealt in brief.*)

CONENTS OF CLASS XII SYLLABUS

UNIT I: REPRODUCTION:

Reproduction in organisms: Reproduction, a characteristic feature of all organisms for continuation of species; Modes of reproduction – Asexual and sexual; Asexual reproduction; Modes-Binary fission, sporulation, budding, gemmule, fragmentation; vegetative propagation in plants.

Sexual reproduction in flowering plants: Flower structure; Development of male and female

gametophytes; Pollination-types, agencies and examples; Outbreeding devices; Pollen-Pistil interaction; Double fertilization; Post fertilization events- Development of endosperm and embryo, Development of seed and formation of fruit; Special modes-apomixis, parthenocarpy, polyembryony; Significance of seed and fruit formation.

Human Reproduction: Male and female reproductive systems; Microscopic anatomy of testis and ovary; Gametogenesis-spermatogenesis & oogenesis; Menstrual cycle; Fertilization, embryo development upto blastocyst formation, implantation; Pregnancy and placenta formation (Elementary idea); Parturition (Elementary idea); Lactation (Elementary idea).

Reproductive health: Need for reproductive health and prevention of sexually transmitted diseases (STD); Birth control-Need and Methods, Contraception and Medical Termination of Pregnancy (MTP); Amniocentesis; Infertility and assisted reproductive technologies – IVF, ZIFT, GIFT (Elementary idea for general awareness).

UNIT II: GENETICS AND EVOLUTION:

Heredity and variation: Mendelian Inheritance; Deviations from Mendelism- Incomplete dominance, Co-dominance, Multiple alleles and Inheritance of blood groups, Pleiotropy; Elementary idea of polygenic inheritance; Chromosome theory of inheritance; Chromosomes and genes; Sex determination-In humans, birds, honey bee; Linkage and crossing over; Sex linked inheritance- Haemophilia, Colour blindness; Mendelian disorders in humans- Thalassemia; Chromosomal disorders in humans; Down's syndrome, Turner's and Klinefelter's syndromes.

Molecular basis of Inheritance: Search for genetic material and DNA as genetic material; Structure of DNA and RNA; DNA packaging; DNA replication; Central dogma; Transcription, genetic code, translation; Gene expression and regulation- Lac Operon; Genome and human genome project; DNA finger printing.

Evolution: Origin of life; Biological evolution and evidences for biological evolution from Paleontology,comparativeanatomy,embryologyandmolecularevidence);Darwin'scontribution,

Modern Synthetic theory of Evolution; Mechanism of evolution-Variation (Mutation and Recombination) and Natural Selection with examples, types of natural selection; Gene flow and genetic drift; Hardy-Weinberg's principle; Adaptive Radiation; Human evolution.

UNIT III: BIOLOGY AND HUMAN WELFARE:

Health and Disease; Pathogens; parasites causing human diseases (Malaria, Filariasis, Ascariasis. Typhoid, Pneumonia, common cold, amoebiasis, ring worm); Basic concepts o immunology vaccines; Cancer, HIV and AIDS; Adolescence, drug and alcohol abuse. Improvement in food production; Plant breeding, tissue culture, single cell protein, Biofortification; Apiculture and Animal husbandry.

Microbes in human welfare: In household food processing, industrial production, sewag treatment, energy generation and as biocontrol agents and biofertilizers.

UNIT IV: BIOTECHNOLOGY AND ITS APPLICATIONS:

Principles and process of Biotechnology: Genetic engineering (Recombinant DNA technology).

Application of Biotechnology in health and agriculture: Human insulin and vaccine production, gene therapy; Genetically modified organisms-Bt crops; Transgenic Animals; Biosafety issues-Biopiracy and patents.

UNIT V: ECOLOGY AND ENVIRONMENT:

Organisms and environment: Habitat and niche; Population and ecological adaptations; Population interactions-mutualism, competition, predation, parasitism; Population attributes-growth, birth rate and death rate, age distribution. Ecosystem: Patterns, components; productivity an decomposition;

Energy flow; Pyramids of number, biomass, energy; Nutrient cycling (carbon and phosphorous); Ecological succession; Ecological Services-Carbon fixation, pollination, oxygen release. Biodiversity and its conservation :Concept of Biodiversity ;Patterns of Biodiversity; Importance of Biodiversity; Loss of Biodiversity; Biodiversity conservation; Hotspots, endangered organisms, extinction, Red Data Book, biosphere reserves, National parks and sanctuaries.
Environmental issues: Air pollution and its control; Water pollution and its control; Agrochemicals and their effects; Solid waste management; Radioactive waste management; Greenhouse effect and global warning; Ozone depletion; Deforestation; Any three case studies a success stories address in environmental issues.

APPENDIX-B

Syllabus of BHMCT/B.Sc. (HM & CT)

Section A: General English
Comprehension of Passage, Verbal Reasoning, Syllogisms, Antonyms, Fill in the Blanks, Jumbled Paragraphs with 4 or 5 sentences, Sentence Correction, Sentence completion, Sentence Correction, odd man out, idioms, one-word substitution, Different usage of same word etc.

Section B: General Knowledge
Current National and International Affairs, Business, Punch line of companies, Top officials of big companies, Major corporate events, Trade and Commerce, Famous award and prizes Science, Scientific Inventions, Social Science, Geography, International organizations History, Social issues, Culture, Entertainment, Polities etc. Sports, Finance, Automobiles, Travel and Tourism.

Section C: Reasoning
Critical reasoning, Visual reasoning, Assumption- Premise- Conclusion, Assertion and reasons, Statements and assumptions, identifying valid inferences, identifying Strong arguments and Weak arguments, Statements and Conclusions, Cause and Effect, Identifying Probably true, Probably false, definitely true, definitely false kind of statement, Linear arrangements, Matrix arrangements.
Puzzles, Syllogisms, Functions, Family tree- identifying relationship among group of people, Symbol Based Problems, Coding and Decoding, Sequencing, identifying next number in series, etc.

Section D:
Data Interpretation: There will be questions of data interpretation which will be mostly based of various graphs.

Graphs: Column graphs, Bar Graphs, Line charts, Pie Chart, Graphs representing Area, Venn diagram etc.

APPENDIX-C

HPCET-2025 Syllabus for MCA, MBA, MBA (T&HM)

Section A: HPCET syllabus for VARC (Verbal Ability & Reading Comprehension- 25 questions, 100 marks). The VARC section will be the first section of HPCET question paper, comprising two sub parts: **Verbal Ability & Reading Comprehension (VARC)**

(Q. No.: 1 to 25)

HPCET VARC SYLLABUS		
Fill in the blanks	Para completion and inference	Verbal logic
Verbal reasoning	Subject-verb agreement	Parajumbles
Sentence completion	Foreign language words used in English	Different usage of same word
Grammar	Reading comprehension	Idioms
Syllogisms	Analogies	Antonyms
Jumble paragraphs	Sentence correction	One word substitution
Parts of speech	Preposition	Type of clauses
Phrases modifiers	Error in tenses	Articles usage

Section B: HPECT syllabus for DILR (Data Interpretation & Logical Reasoning-25 questions, 100 marks) Data Interpretation & Logical Reasoning (DILR) comprises the second section of this question paper and is to be solved after the VARC section. It consists of two sub parts: **Data Interpretation and Logical Reasoning (DILR)**

(Q. No.: 26 to 50)

HPCET DILR SYLLABUS		
Blood Relations	Clock sand Calendars	Syllogism
Series	Statements	Venn Diagram
Propositions	Data Arrangement	Data Structures
Direction Sense	Family Tree	Tables
Coding-Decoding	Binary Logic	Pie Charts
Assumptions	Seating Arrangement	Data Sufficiency
Puzzles	Sets & Caselets	Bars & Line Graphs

Section C: HPCET syllabus for QA (Quantitative Ability- 25 questions, 100 marks) **Quantitative Aptitude** will be the third & last section of this question paper.

(Q. No.: 51 to 75)

HPCET QA SYLLABUS		
Geometry	Ratios and Proportion	Inequalities
Trigonometry	In-equations Quadratic and linear equations	Work and Time
Algebra	Surds and Indices	Percentages
Mensuration	Time-Speed-Distances	Logarithms
Partnership(Accounts)	Number System	Square root and Cube root
Profit &Loss	Geometric Progression	Probability
Mean, mode, median	Binomial theorem	Simple interest and Compound interest

APPENDIX-D

Syllabus of M.Sc. Physics

Section-A

Mathematical methods

Infinite sequences and series- convergence and divergence, conditional and absolute convergence, ration test for convergence. Calculus of single and multiple variable, partial derivatives, Jacobian, Imperfect and perfect differentials. Taylor Expansion, Vector algebra, Vector Calculus, Multiple integrals, Divergence theorem, Green's theorems, Stokes' theorem, Orthogonal coordinate systems. First order equations and linear second order differential equations with constant coefficients. Linear vector spaces, linear independence, basis. Matrices and determinants, Hermitian adjoint and inverse of a matrix; Hermitian, orthogonal and unitary matrices; Eigenvalue and eigenvectors. Fourier expansion- statement of Dirichlet's condition, analysis of simple waveforms and Fourier series. Probability distributions and error analysis.

Classical mechanics and general properties of matter

Newton's laws of motion and applications, Velocity and acceleration in Cartesian, Polar and cylindrical coordinate systems. Uniformly rotating frame, Centrifugal and Coriolis forces, System of particles. Center of mass, Equation of motion of the CM, Conservation of linear and angular momentum, Conservation of energy, Variable mass systems Motion under a central force, Kepler's laws Gravitational Law and field, Conservative and nonconservative forces Elastic and inelastic collisions. Differential equation for simple harmonic oscillator and its general solution, Superposition of two or more simple harmonic oscillators, Lissajous figures, Damped and forced oscillators, resonance, Wave equation, travelling and standing waves in one dimension, Energy density and energy transmission in waves, Group velocity and phase velocity, Sound waves in media, Doppler Effect. Rigid body motion, Euler angles, Fixed axis rotations. Moments of Inertia and products of Inertia, Parallel and perpendicular axes theorem, Principal moments and axes. Kinematics of moving fluids, Equation of continuity, Euler's equation, Bernulli's theorem.

Section-B

Optics

Fermat's principle, General theory of image formation, Thick lens, Thin Lens and lens combinations. Huygen's Principle, Interference of light, Optical path retardation, interferometers. Fraunhofer diffraction, Rayleigh criterion and resolving power, Diffraction gratings. Linear, Circular and elliptic polarization, Double refraction and optical rotation. Lasers, principle and working.

Electricity and magnetism

Electricity and Magnetism: Coulomb's law, Gauss's law, Electric field and potential Electrostatic boundary conditions, Solution of Laplace's equation for sample cases. Conductors, Capacitors, Dielectrics, Dielectric polarization Volume and surface charges, energy stored in Electromagnetic field Biot-Savart law, Ampere's law, Faraday's law of electromagnetic induction, Self and mutual inductance. Alternating currents, Simple DC and AC circuits with R, L and C components. Displacement current, Maxwell's equations and plane electromagnetic waves, poynting's theorem. Lorentz Force and motion of charged particles in electric and magnetic fields. Reflection and refraction at a dielectric interface, Transmission and reflection coefficients.

Section-C

Modern Physics

Inertial frames and Galilean invariance, Postulates of special relativity, Lorentz transformations, length contraction, Time dilation, Relativistic velocity addition theorem, Mass energy equivalence. Blackbody radiation, Planck's law, Rayleigh-Jeans and Wein's Law, Photoelectric effect, Compton Effect. Bohr's atomic model, Sommerfeld's correction, X-rays. Wave-particle duality, Uncertainty principle. Wave function and it's interpretation, wave packets, Dynamical variables as operators, measurement of observables, expectation values. Commutation relations between operators and compatibility, observables and simultaneous measurements, Ehrefest's theorem. Schrodinger equation and its solution for one, two and three dimensional boxes, Solution of Schrodinger equation for the one dimensional harmonic oscillator, Reflection and transmission at a step potential.

Nuclear and Particle Physics

General properties of Nuclei, Nuclear Models: liquid drop model, condition of nuclear stability. Experimental evidence for nuclear magic numbers, elementary accounts of nuclear shell model and its predictions, Radioactivity, qualitative account of the theory of alpha decay and beta decay, Interaction of Nuclear Radiation with matter; Energy loss due to ionization energy loss of electrons, Cerenkov radiation, Rutherford scattering, Multiple coulomb scattering, passage of gamma-rays through matter. Compton scattering, pair production radiation loss by fast electrons, Radiation length and electrongamma showers, position a annihilation, Relativistic Kinematics. Particles Accelerators and Detectors, classification of elementary particles, Types of interactions and its features, Mass spectra and major decays of elementary particle; leptons, mesons, baryons, Weak and electromagnetic Decays of Strange mesons and Hyperons. Classification of weak decays and selection rules.

Section-D

Atomic and Molecular

Spectroscopy Good quantum numbers and selection rules. Stern-Gerlach experiment, Fine structure, Magnetic moment of the electron, Lande g factor, Vector model-Space quantization. Zeeman effect. Explanation from vector atom model. Pauli exclusion principle, shell structure. Hund's rule, spectroscopic terms of many electron atoms in the ground state, Spectra of alkali and alkaline earth atoms. Rotational and vibrational spectra, Raman effect, Stokes and anti-stokes lines, complimentary character of Raman and Infrared spectra, experimental arrangements for Raman spectroscopy.

Kinetic Theory of Gases and Thermodynamics

Elements of Kinetic theory of gases. Velocity distribution and Equipartition of energy. Specific hear of Mono-, di-and tri-atomic gases. Ideal gas, van-der-Waals gas and equation of state. Mean free path. Laws of thermodynamics. Zeroth law and concept of thermal equilibrium. First law and its consequences. Isothermal and adiabatic processes. Reversible, irreversible and quasi-static processes. Second law and entropy. Carnot cycle. Maxwell's thermodynamic relations and simple applications. Ideas of ensembles, Maxwell-Baltzmann, Fermi-Dirac and Bose-Einstein distributions.

Solid State Physics and Electronics

Basics of Crystal Structure: Lattice and basis, primitive and unit cell, Wigner Seitz cell, symmetry operations, lattice types, paeking fraction, Miller indices, simple structures NaCL, diamond. Diffraction Methods: Bragg's Law, experimental arrangements. Laue equation, reciprocal lattice, atomic scattering factor, geometrical structure factors. Crystal bonding: potential between a pair of atoms, LennardJones potential, Ionic, Covalent, Vander- Wall's cohesive energy, Lattice Vibration, specific heat Einstein and Debye's models of specific heat. Free electron theory of metals, Band Theory of Metals: Kronig Penny model, Brillouin zones, electrons in

periodic structure, energy bands, energy gaps, effective mass of electrons and holes, metals, insulators, semiconductors, Magnetism, Curie-Weiss law, Langevin theory, basics of superconductivity. Junction Diodes, Transistors their characteristics and simple circuit design: Thevnim's Theorem, Norton Theorem, Constant Voltage and current generator, idea of equivalent circuits, low frequency equivalent circuits, low frequency equivalent circuits, h-parameters, bias stability, thermal runaway, BIJ, FET' s and MOSFETS: Structure and working FET amplifier. Oscillators: Tuned Collector, Hartley and Colpitts oscillators, phase shift oscillators. Operational Amplifier, Inverting noninverting amplifier, OP-Amp as adder subtractor, comparator, integrator and differentiator. Modulation and detection, Digital electronic fundamentals, various number systems, Basic logic gates, de-Morgan's law.

APPENDIX-E

Syllabus of M.Sc. Environmental Sciences

Section A

Earth Sciences: Structure and composition of Environment- Atmosphere, Hydrosphere and Lithosphere, Earth Processes, Mineral and Power Resources in India, Biogeochemical Cycles, Meteorology, Climate Change, Origin and evolution of earth, Mineral and Power Resources in India.

Section B

Physical and Chemical Sciences: Fundamentals, Atmospheric Chemistry, Water Chemistry, Geochemistry, Green Chemistry, Water-Physics characterstics, buffering capacity, Essential and trace elements in living systems, Bio-molecules-chemical components of cell, Bio-geochemical cycles-carbon, nitrogen and phosphorus, Hydrological cycle and global water balance, Toxicity of Heavy metals.

Section C :

Life Sciences
Origin of life: Theories of evolution, genetic drift, speciation , cell organelles, cell division, modes of reproduction, principles of inheritance, epistasis, mutations, chromosomal aberrations, extra-chromosomal inheritance.

Genetic Material: DNA structure and replication, transcription and translation, chromosome structure, protein structure, mutability and repair of DNA, reverse genetics.
Photosynthesis, Plant growth hormones, Dormancy and seed germination, Respiration.

Plant and Animal Systematics: Bryophytes, Tracheophytes, Gymnosperms, Angiosperms. Membrane structure and Ion transport, ATPase- structure and function, Photosynthesis, Photoperiodism, Vernalization, RUBISCO.

Animal systematic, physiology and diseases: Cnidaria, Echinodermata, Chordata, Protostomia; Anatomy and physiology of humans; major classes of bacterial and viral pathogens, Apoptosisand cancer, inherited diseases, animal cell culture.

Eclology and Environment: Biosphere, Organizational level of biosphere, Ecosystem: Structure and Types, Food Chain and Energy Flow, Population and community Ecology, Biodiversity andits Conservation.
Microbiology and Biotechnology: Principles of Microbiology, Microbiology of Air, Water, Soil, Sewage, Recombinant DNA technology, principles of gene cloning, transposition, applications of biotechnology in medicine, industry, agriculture and environment.

Natural resources and Management: Natural Resources-Forest, Water, Minerals Marine, Energy (Renewable and Nonrenewable)- Sources, Threats, Conservation and Management.
Global Environmental issues: Ozone depletion and Global warming, Acid rain and Smog, Sustainable Development.

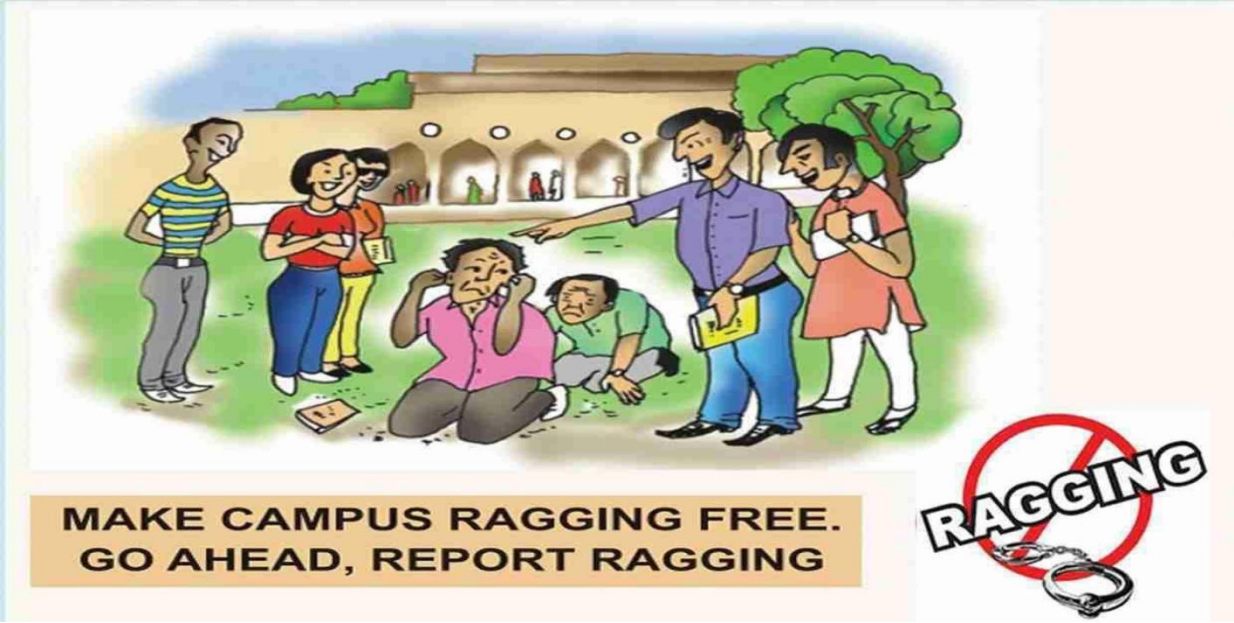
Environmental Pollution: Air, Water, Soil, Noise Pollution- Sources, Causes, Effects, Consequences.
Waste Management: Solid waste- Disposal, Management; Waste of energy conservation.
Instrumentation: Principles and applications of microscopy, spectrophotometer, centrifugation, radioisotope techniques, electrophoresis and chromatographic separation techniques, Blotting and hybridization techniques.

APPENDIX-F

Under Graduate Engineering Entry level qualification: 10+2 level

SN	Major Disciplines	Mandatory courses At 10+2 Level	Other relevant course(s) for This discipline
1	Civil Engineering	Phy, Chem, Maths	NA
2	Computer Science & Engineering / Computer Science &Engineering (Artificial Intelligence & Machine Learning) / Computer Science & Engineering(Artificial Intelligence & Data Science)	Phy, Maths	#For remaining single course, select any courses out of 14
3	Electrical Engineering/Electrical & Electronics Engineering / Electronics and communication Engineering	Phy, Maths	#For remaining single course, select any courses out of 14
4	Mechanical Engineering	Phy, Chem, Maths	NA
5	Architecture	As per Norms of Council of Architecture (CoA)	

Physics/ Mathematics / Chemistry/ Computer Science/Electronics/Information Technology/ Biology/ Informatics Practices/Biotechnology/Technical Vocational subject/Agriculture/Engineering Graphics/ Business Studies/Entrepreneurship.



Punishment for Participation in/or Abetment of Ragging:

- Cancellation of admission.
- Suspension from attending classes.
- Withholding/withdrawing scholarship/fellowship and other benefits.
- Debarring from appearing in any test/examination or other evaluation process.
- Withholding results.
- Debarring from representing the institution in any National or International meet, tournament, youth festival, etc.
- Suspension/expulsion from the hostel.
- Rustication from the institution for period varying from 1to 4 semesters or equivalent period.
- Expulsion from the institution and consequent debarring from admission to any other institution.