10. SPECIAL INSTRUCTIONS TO THE CANDIDATES APPEARING FOR THE ENGINEERING ENTRANCE EXAMINATION 2022

Note: Read the following instructions carefully. Failure to observe instructions may affect the candidate's performance.

10.1 Reporting for the Examination:

(i) Candidates should bring Admit card, ballpoint pen (either blue or black ink) and a card board/clip board for the Examination.

(ii) Candidates will not be permitted to take items such as pencil, eraser, correction fluid, calculator, logarithm table, electronic gadgets, mobile phones etc. into the examination hall.

(iii) Candidate should be present at the examination hall, 30 minutes before the prescribed time for the commencement of the examination.

(iv) No candidate will be permitted to enter the examination hall, 30 minutes after the commencement of the examination.

(v) Candidates will be permitted to leave the examination hall only after completion of the examination.

10.2 Question Paper

10.2.1 The question papers will be given in the form of a question booklet. A candidate will be given the question booklet before the actual time prescribed for the commencement of the examination, to enable him/her to acquaint himself/herself with the instructions to be followed.

FACING PAGE LAYOUT OF QUESTION BOOKLET (*Engineering*)

WARNING :	**Any malpractice or any attempt to commit any kind of malpractice in the Examination will DISQUALIFY THE CANDIDATE.**	
PAPER		
Version Code	Question Booklet Serial Number	
Time : 150 Minutes	Number of Questions : 120	Maximum Marks : 480
Name of Candidate		
Roll Number		
Signature of Candidate		
INSTRUCTIONS TO THE CANDIDATE		

10.2.2 Each question paper will have 4 versions as detailed below:

Engineering Entrance Examination:
Paper I - Physics & Chemistry   **Versions - A1, A2, A3 & A4.**
Paper II - Mathematics   **Versions - B1, B2, B3 & B4.**

10.2.3   The question booklet version will be printed on the top left margin of the facing sheet of the question booklet.

10.2.4   If the Roll Number ends in an odd number, then the candidate should get a question booklet marked A1/B1/A3/B3. If the Roll Number ends in an even number, then the candidate should get a question booklet marked A2/B2/A4/B4.

10.2.5   On receipt of the question booklet the candidate should ensure that the Version Code printed in the Admit Card and in the question booklet are the same.

10.2.6   If the candidate gets a question booklet where the version does not match the Roll Number as stipulated in 10.2.4, he/she should draw the attention of the invigilator immediately, and get it replaced by a version that matches the Roll Number.

10.2.7   The question booklet serial number is printed on the top right margin of the facing sheet. If the question booklet does not bear a serial number, get it replaced by a new question booklet of the same version having a booklet number printed.

10.2.8   Candidate must write his/her name and roll number in the space provided in the Question booklet. The Roll Number should be written carefully. The column for the signature of the candidate should also be filled in (The signature should be identical with the signatures in the admit card and in the attendance sheet).

10.2.9   The question booklet will be sealed at the middle of the right margin. The candidate should not open the question booklet, until an indication is given by the invigilator to start answering at the scheduled time.

10.3   **Answer Sheet:**

10.3.1   Separate answer sheet (OMR Answer Sheet) having a copy of the original OMR sheet attached to it, will be given to mark the answers. **Candidates should not detach the copy of the OMR sheet from the original during the course of Examination**. All impressions made in the original OMR sheet will be carried over to the copy attached. Hence candidates, while making entries in the OMR sheet and while answering, should ensure that the copy of the OMR is always aligned with the original OMR sheet. Any change in alignment can result in variation of the position of the entries in the original and copy of OMR sheets. If any candidate detaches the copy before the conclusion of the examination, his/her candidature is liable to be cancelled.

10.3.2   The evaluation of the answer sheet of objective type papers will be done using the **OPTICAL MARK READING (OMR)** System. Hence the answer sheet (OMR answer sheet) is designed to suit this system.

10.3.3   A specimen copy of the OMR answer sheet is included in the Prospectus (Annexure XXIII). Each answer sheet will be having a unique pre-printed 'BARCODE' that will be used as a secret code against which the evaluation takes place. Candiates should not tamper with the BAR CODE. If a candidate tampers, mutilates or damages the barcode, it will be treated as malpractice as per Clause 10.10 and he/she will be liable for punishment as per Clause 10.10.2. The answer sheet in respect of such candiates will not be subjected to valuation.

10.3.4 **IMPORTANT**: Extra care is needed while handling the OMR Answer sheet in the following respects.

DO NOT: (i) Pin or staple (ii) Punch or tag (iii) Make holes anywhere (iv) Wet or soil (v) Tear or mutilate (vi) Wrinkle or fold the OMR Answer Sheet.

10.4 **Filling in the OMR Answer Sheet**:

10.4.1

> ### IMPORTANT
>
> All entries in OMR answer sheet are to be made with blue or black ink BALL POINT PEN only.
> Marking with fountain pen, gel pen, sketch pen or pencil is not permitted.
> Use of any ink of colour other than blue or black is not permissible.

10.4.2 The answer sheet has two parts – 'CANDIDATE'S DATA PART' on the left side and 'ANSWER PART' on the right side with a thin perforation in between, length-wise. Fill in all the entries on the left side (Candidate's Data part) before beginning to answer questions.

(a) **CANDIDATE'S DATA PART**: (Left side of the sheet)

Fill in the boxes and the appropriate bubbles with blue or black ink ballpoint pen.

- **Version Code:** Fill in and mark the Version Code as given in the Question Booklet with blue or black ink ballpoint pen. The Version Code should be entered without any corrections or overwriting.
- **Roll Number**: Fill in and mark the Roll No. as given in the admit card with ballpoint pen. The Roll number should be entered without any corrections or overwriting.
- **Question booklet Sl. No**. has to be entered as given in the top right side of the question booklet.
- **Name**: Fill up the item correctly and legibly. Name is to be entered as given in the admit card with ballpoint pen.
- **Fill up the Roll Number again**.
- **Name of subject**: Enter name of the subject.
- **Signature of the Candidate**: The candidate has to sign in the box provided and the signature should be identical with the signature affixed in the admit card and attendance sheet. The item for signature of the invigilator will be filled in by the person concerned.

(b) **ANSWER PART OF THE OMR SHEET**: (Right side of the sheet)

> Do not write your roll number or name or make any stray marks on this part of the sheet. Do the marking for answers only in the spaces provided (bubbles).

10.4.3 **Method of marking**:

(a) The Answer part of the OMR sheet (right side) consists of ovals, known as 'bubbles'. USE ONLY BALLPOINT PEN (BLUE OR BLACK INK) for filling (marking) these bubbles. Marking with any other colour or with sketch/gel pen is not permitted.

(b) Each question will have five answers marked (A), (B), (C), (D) and (E).The most appropriate answer will have to be selected. Thereafter, using ballpoint pen (blue or black ink) mark the bubble corresponding to the most appropriate answer. For example if the answer to question 2 is C, bubble C has to be darkened as shown:
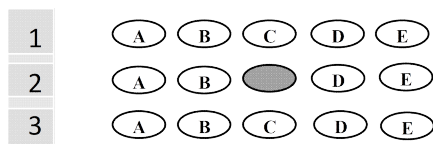
(c) Mark only one bubble for each question. The bubble should be filled completely and must be dark.

(d) Here are some **wrong methods** of marking answers, such as
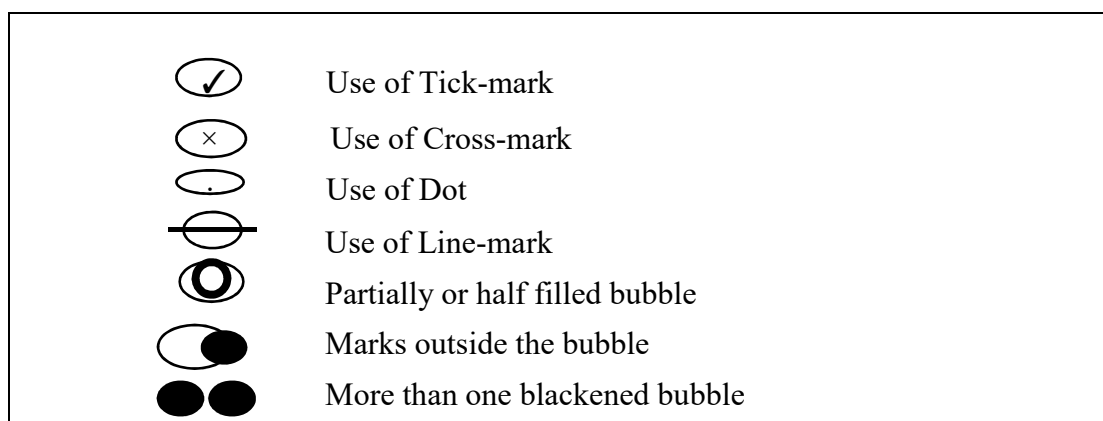
In all these cases mentioned above, though the candidate may have given the correct answer, it may not be read by the scanner because of the wrong method of marking the answer.

(e) The bubble should be filled completely. Candidates are advised not to make any special effort to mark bubbles artistically.

(f) Warning: Marking once made will be final.

(g) Any attempt to erase the mark once made will leave smudges or marks on the bubble, which will be treat as a valid mark.

(h) Any fresh mark made after attempting erase of an already marked bubble will lead to multiple marks with the consequent penalty leading to Negative Mark.

10.5 The question booklet for each paper will be supplied to the candidate only five minutes before the actual time prescribed for the commencement of the examinations. The candidates should take care to mark the necessary entries, in the question booklet

as well as on the OMR answer sheet immediately before beginning to answer the questions.

10.6 Immediately after the commencement of the examination, the candidate should check that the question booklet supplied is of the correct version and that it contains all the 120 questions in serial order. The question booklet should not have unprinted or torn or missing pages in it. If the question booklet does not agree with the above, the matter should be brought to the immediate attention of the invigilator. In such cases the invigilator should take immediate action to rectify the same by issuing the candidate a fresh question booklet of the same version. The question booklet initially issued will be taken back only after the replacement is made.

10.7 Candidates are warned that they should enter only the necessary information as required in the OMR answer sheet (on the left part). Any additional information, which is not required and which may help to identify the candidate (made in any part of the OMR sheet), will be treated as malpractice as per Clause 10.10 and will be dealt with as per Clause 10.10.2.

10.8 Candidates will get the copy of the OMR sheet after the completion of the examination. The copy which is attached to the Main OMR sheet will be detached by the Invigilator in the presence of the candidate after the completion of the examination. The candidates will be permitted to carry this copy with them after the Examination.

10.9 Any mistake in filling up the data part of the OMR sheet or in marking the answers will affect the valuation of the script adversely.

10.10 **WARNING AGAINST MALPRACTICE**

Malpractice is an activity that allows a candidate to gain an unfair advantage over other candidates. It includes, but not limited to:

a) Having in possession of papers, books, notes, correction fluid, whitener, correction pen, blade, pencil, eraser, electronic devices or any other material or information relevant to the examination concerned;

b) Paying someone to write examination (impersonation) or prepare material;

c) Breaching examination rules;

d) Assisting another candidate to engage in malpractice or attempting to do so;

e) Contacting or communicating or trying to do so with any person, other than the Examination Staff, during the examination time in the examination hall;

f) Taking away the answer sheet out of the examination hall;

g) Threatening any of the officials connected with the conduct of the examination or threatening any of the candidates;

h) Using or attempting to use any other undesirable method or means in connection with the examination;

i) Manipulation & fabrication in online documents viz. Admit card, Allotment letter, Data sheet etc;

j) Forceful entry in Examination Hall with malafide intentions;

k)   Possession of Calculators, Slide Rules, Log Tables, Geometry Box, Pencil box, Electronic Digital Watches with facilities of calculators, mobile phones or any other electronic gadget which are not allowed inside the Examination Hall;

l)   Tampering of Barcode in the OMR sheet or mutilation of OMR sheet or marking unnecessary information on OMR.

m)   Fabricated photograph uploaded to the online application:

Note: Parents/Guardians are advised to ensure that their ward does not indulge in unfair activities/malpractices which breach the examination rules. If any candidate is found to indulge in any such activity he/she shall be liable for punishment as per Clause 10.10.2.

10.10.1 GUIDELINES TO CHIEF SUPERINTENDENT

In the event of observing malpractice in the examination hall by a candidate, the candidate shall not be allowed to continue to write the examination. The examination Question Booklet, OMR and Admit Card of the candidate who indulges in the malpractice along with the materials in possession at examination hall which the candidate used for malpractice at the examination hall such as Calculators, Electronic Digital Watches with facilities of calculators, mobile phones or any other electronic gadget etc. shall be confiscated and reported to the CEE with a report signed by the Invigilator, Chief superintendent and Observer in a sealed cover through the CEE representative/Liaison Officer.

10.10.2 PUNISHMENT FOR MALPRACTICE

If a candidate is found to have indulged in any malpractice or similar practices, during the course of Kerala Engineering Entrance Examination, before or later on, shall be deemed to have committed malpractice at examination and his/her candidature in the entrance examination will be cancelled. **Such candidates shall be debarred from appearing in the entrance examination conducted by CEE for not less than two years and shall also be liable for criminal action and /or any other action as deemed fit by CEE. Decision of the CEE in this regard shall be final.**

10.11   IMPERSONATION

If during the Kerala Engineering Entrance Examination or at any stage of allotment/admission process of KEAM 2022 it is found that candidates appearing in the Kerala Engineering Entrance Examination or in the admission process of KEAM 2022 at the allotted College have indulged in any case of impersonation i.e. not matching the photograph/signature/documents of the candidates etc. he/she shall be handed over to the Police by the Chief superintendent/Liaison Officer /Principal as the case may be and the cases shall be dealt with as per the Indian Penal Code in this matter for further investigation. The matter shall also be reported to the CEE by the Chief Superintendent/Liaison Officer /Principal in writing.

Such candidates will be debarred permanently from appearing for the KEAM Entrance Examination conducted by the CEE in future in addition to the cancellation of his/her candidature in the KEAM entrance examination of the year.

11. **CENTRALISED ALLOTMENT PROCESS (CAP) & ONLINE SUBMISSION OF OPTIONS**

The Centralised Allotment Process will be done through the **Single Window System** (SWS) to give allotments to the various courses and colleges under the Engineering/ Architecture/ Pharmacy/Medical streams in the State, based on the options submitted by the candidates who have been included in the rank list of the Engineering/Architecture/B.Pharm/ Medical & Medical Allied/Ayurveda courses for the year 2022, prepared by the Commissioner for Entrance Examinations (CEE), Kerala. This is a system of 'Allotments through Online Submission of Options'. The options are willingness of a candidate who qualified with a rank in the rank lists of KEAM-2022 to join a course-college combination prioritised as per his/her aspiration and desire subject to the conditions specified in Clauses 6 and 9.7.5. The CAP through which the Options are registered is a simple and transparent process of allotment to the Professional Degree Courses and it gives the candidate opportunity to exercise his/her options for courses and colleges of his/her choice conveniently in the order of his/her preference considering all those available to be chosen from. The allotments will be strictly based on the options exercised, the rank obtained and eligible reservations of the candidate. **Candidates should register options only to those courses/colleges which they are sure to join on allotment. If the candidate fails to remit fee/join the college, he/she will lose the allotment as well as all the existing options in the stream to which the allotment belongs. The options once lost will not be available in the subsequent phases. When an allotment is given to a candidate, the previous allotments, if any, shall automatically be cancelled.**

11.1 The online Centralized Allotment Process 2022 will be done by the Commissioner for Entrance Examinations (CEE), Kerala, with the technical support of the National Informatics Centre (NIC).

11.2 Seats in Government/Aided/KAU/KVASU/KUFOS/Govt. Cost sharing/ Private Self Financing/Autonomous Colleges to be allotted by the Commissioner for Entrance Examinations, will be included in the CAP and will be done as per the provisions of allotment.

11.3 (a) Seats for the Engineering, Architecture, B.Pharm, MBBS, BDS, Ayurveda, Homoeo, Siddha, Unani courses and seats for the Agriculture, Forestry, Co-operation & Banking, Climate Change & Environmental Science, B.Tech Biotechnology (under KAU), Agricultural Engineering and Food Technology Courses under the Kerala Agricultural University, Fisheries and Food Technology course under Kerala University of Fisheries & Ocean Studies, and Veterinary& AH, Dairy Technology and Food Technology

courses under Kerala Veterinary & Animal Sciences University will be available for allotments by CEE through the CAP.

(b) The courses for Option Registration under CAP are classified as Engineering Stream, Medical Stream and Pharmacy Stream. All courses listed in Clauses 1.3.1 and 1.3.2 are included in Engineering Stream. All courses listed in Clauses 1.3.3, 1.3.4, 1.3.5 and 1.3.6 are included in Medical Stream. B.Pharm course under clause 1.3.7 is included in Pharmacy Stream.

(c) The candidates are eligible to register option to the courses of any stream or all streams provided they are qualified with a rank in the respective rank lists of KEAM-2022 as per the conditions specified in Clauses 5, 6 and 9 of the KEAM-2022 Prospectus.

(d) Only female candidates can register options to the courses in Women's Colleges under CAP if they are otherwise qualified as per various Clauses of the KEAM-2022 Prospectus.

11.4 Rules and regulations governing allotments through submission of options:

11.4.1 **Candidate to register options**: Candidates included in the Rank lists for Engineering, Architecture, B.Pharm, MBBS/BDS/ BHMS/BSMS/BUMS, Agriculture/Forestry/Co-operation & Banking, Climate Change & Environmental Science, B.Tech Biotechnology (under KAU), Veterinary, Fisheries and Ayurveda courses 2022, will have to register their options in the stream(s) concerned as prescribed under Clause 11.5, for being considered for allotments to the courses and colleges under the respective stream(s).

11.4.2 **Registering Options**: Options can be registered only through the website, 'www.cee.kerala.gov.in'. Candidates will have to register their options in single stream or multiple streams (based on their eligibility) in the 'Option Registration Page' accessible through the 'Candidate Portal' within the stipulated period of time. Candidates should access the 'Option Registration Page' and follow the instructions given therein and as described in Clause 11.5, to register their options for courses and colleges. **Options submitted to the CEE by Fax, Post, Hand delivery etc., will not be processed or considered on any account for allotment of seats.**

11.4.3 **Facility for Registering Options**: Candidates can register their options within the time schedule specified, using any computer having internet facility. Candidates who do not have access to Internet facility can use the facility provided free of cost, by the Government at various centres across the state. **'Facilitation Centres'** (FC) will be opened across the state during a specified period for the candidates who need assistance for registering their options. The list of FCs will be published in the website of the Commissioner for Entrance Examinatins. <u>The Facilitation Centres will be functioning only during the option registration period which will be notified later.</u>

11.4.4 **Time schedule for registering options**: The facility for registering options will be available only during the period specified in the notifications to be issued by the CEE.

Wide publicity will be given through electronic and print media regarding the schedule and related matters. The facility will be withdrawn once the time period is over and candidates will not have access to this facility after this time period. **A candidate, not registering his/her options as per the time schedule announced, will not be considered for allotments under his/her eligible streams against any of the seats available then, irrespective of his/her rank.** Requests for extension of time will not be entertained under any circumstances for registering options under any of the streams.

11.4.5 **Registering of options in respect of candidates included in different Rank Lists:** A candidate included in different rank lists, can register options of different streams simultaneously based on his/her order of priority of courses and colleges. All options available to the candidate, based on the streams he/she is eligible for, can be registered in a single registration. For example, a candidate included in the Engineering and Medical rank lists can register his/her options in the two streams together, within the specified period of time.

There is no separate time schedule for registering options under each of the streams. All options to all eligible streams will have to be registered as per the time schedule. No extension of time will be granted under any circumstances for registering options under any of the streams.

11.4.6 **Eligibility for registering options**: Only those candidates included in the different Rank Lists prepared and published by the CEE for 2022 are eligible to register their options in the stream concerned. Moreover, the candidates registering their options should satisfy all the eligibility conditions with regard to Nativity (Clause 6.1), Academic qualifications (Clause 6.2), Age (Clause 6.3), etc., of the Prospectus for admission to Professional Degree Courses 2022. **Academic eligibility should be satisfied on the date of admission for various Courses. Principal/Head of the Institution will be personally responsible for verification of eligibility condition as prescribed in the Prospectus, when the candidate reports for admission.** Only those candidates who are found to be qualified as prescribed shall be admitted to the college/institution irrespective of the fact that he/she has an allotment through the CAP.

11.4.7 **Essentials for registering options**: Candidates should have particulars such as Roll Number, Application Number and Password of KEAM-2022 in order to register their options in the website

(i) **Roll number:** This is the six-digit Number allotted by CEE to the candidate which is given in the Admit Card of KEAM-2022.

(ii) **Application number:** This is the seven-digit number printed on the left top part of the Application Acknowledgement page of the Online Application submitted by the candidate for KEAM 2022. This is also printed in the Admit Card issued by the CEE to the candidate.

(iii) **Password:** The Password to be used is the same as the one created and used during the online application submission stage.

11.5 **Procedure for Registering Options:**

Any candidate, who wishes to register his/her options, should have the 'Application number' and 'Password' readily available with him/her. The candidate must also have access to internet facility. For Assistance, candidates can contact the facilitation centres. The list of facilitation centres will be available on the web site. The candidate should follow the procedure given below for registering options:

(i) Log on to the 'Candidate Portal' through the website www.cee.kerala.gov.in using Application Number and Password.

(ii) Proceed to the Option Registration Page by clicking on the 'Option Registration' Link.

(iii) Register Options.

(iv) Save the Options registered

(v) View and Print the List of Options registered.

(vi) Log off from the 'Candidate Portal'.

11.5.1 **Accessing the website**: The candidate can access the website, '**www.cee.kerala.gov.in**' from any computer having internet facility. The platform can be Windows or Linux based and a recent version of Mozilla Firefox is the recommended browser to be used.

11.5.2 **Logging on to the 'Candidate Portal':** In order to log on to the 'Candidate Portal', click the link **'KEAM 2022-Candidate Portal'** given in the startup page of the website, and submit the Application number and Password correctly.

11.5.3 **Accessing the 'Option Registration Page'**: In order to access the 'Option Registration Page', click the link **'Option Registration'** given in the Candidate Portal.

Failure to provide the correct password will stop the candidate from proceeding to the Option Registration Page. It is the responsibility of the candidate to keep the password safe and secure. In case assistance is necessary for logging on to and accessing the Option Registration Page, the candidate may contact a Facilitation Centre (FC). If the candidate cannot remember the password, he/she can reset it through the 'Forgot Password' link, given in the Candidate Portal.

> Application number is candidate specific and hence is usable for the concerned candidate only. Disclosure of the Password to others who may misuse them can result in tampering of the options made by the candidate. The CEE/Government will not be responsible for any such eventuality.

11.5.4 **Courses and Colleges available for registering options**: A list of Course-College combinations available for allotments through the CAP will be displayed on the Option Registration page of the candidate based on the stream(s) the candidate is eligible for. For example, a candidate included only in the Engineering stream will see the

Engineering courses together with the corresponding two-letter codes (Eg:- AE - Applied Electronics and Instrumentation, EC - Electronics and Communication Engineering etc.). Similarly, a candidate in the Medical Stream will see the Medical courses together with the corresponding two-letter codes (Eg:- MM-MBBS, MD-BDS, BA-BAMS etc.). A candidate eligible for both Engineering and Medical streams will see both Engineering and Medical courses. All the Colleges under the stream(s) applicable to the candidate will be shown with their respective three-letter codes (Eg:- TVE-College of Engineering, Thiruvananthapuram, TVM-Government Medical College, Thiruvananthapuram etc.).

11.5.5 **Procedure for registering options in his/her Option Registration Page**: By entering the option number for a course-college combination the candidate can fix his/her preference numbers for the course-college combinations displayed in the Option Registration Page. Here all the eligible options of the candidate will be displayed course-wise and the candidate is expected to enter his/her preference number for a particular combination.

11.5.6 **Registering of the Options and saving/revising the Options registered**:

All eligible options of the candidate will be displayed on the Option Registration Page. The candidate may follow the directions given therein to register the options. The data entered may be saved regularly by clicking the 'Save' button, so that the data already entered is not lost due to unexpected reasons. The candidate should enter only those options in which he/she is interested. Candidates should also note that he/she will be considered for allotment only to those courses and colleges opted by him/her. So, a candidate who has not opted for a course-college combination will not be considered for allotment for that combination. Existing options, registered by the candidate which is available in the Option Registration Page, can be cancelled by clicking on the corresponding 'Delete' button. Changes (including deletions) made in the option list must be saved (by clicking on the SAVE button) before leaving the option registration page. All the valid options registered by the candidate will be processed. If a candidate gets allotted to a particular seat, based on his/her option, he/she is bound to accept it, failing which, he/she will lose that allotment as well as all the existing options in the stream to which the allotment belongs. The options once lost will not be available in the subsequent phases.

11.5.7 **Viewing and Printing of the Option List based on the options registered:** Once the candidate completes the option entry, he/she can view his/her options by clicking on the link provided. An option list will be generated and the candidate can take a printout of the same and keep it for future reference. If the candidate wants to change his/her options already registered, he/she may revise the options as desired and ensure that the option list has come as per his/her preferences.

11.5.8 **Logging off from the Option Registration Page**: Once the candidate is satisfied with the options registered, he/she may 'Log off' the system by clicking on 'logout' link. The

process of 'Registration of Options' is complete upto the last saved option list when the candidate logs off. **This action is compulsory for preventing the misuse of his/her Option Registration Page by strangers.**

11.5.9   **Rearranging option priority**: A candidate may change his/her option priority any number of times within the time schedule permitted. The priority of options registered and saved at the time of closing of the facility for registering options alone will be considered for processing. No candidate will be allowed to register options afresh to any stream at any stage after the stipulated time as notified by the CEE. The option list once finalized cannot be augmented after the stipulated time for registering options. But the modification of the option list will be allowed only for cancellation/deletion and for re-arrangement of priority of options at the time specified in the notification by the CEE.

11.5.10   **Trial Allotments**: The CEE will conduct Trial Allotment before the closure of the time fixed for registering options during the 1st Phase of allotment to give an idea about the chances of getting allotment to a course and college based on options and rank of the candidate. **The trial Allotment does not guarantee that the candidate will get allotment in a college or course.**

11.6   **Processing of Options and Allotment:**

11.6.1   **Allotment Schedule**: After the period earmarked for registering options, they will be processed and the allotment for all courses will be published on the website, 'www.cee.kerala.gov.in', on the date notified by the CEE. The allotment memo, the printout of which can be taken from the website, will show the college to which the candidate is allotted and the fee to be remitted for the course allotted.   Necessary notifications in this regard will be issued by the CEE.

11.6.2   **Remittance of Fee**: The fee prescribed in the Allotment Memo will have to be remitted by the candidate to the   CEE by way of Online Payment or by making remittance at the designated Post Offices in Kerala to be notified by the CEE.   After the candidate remits the fee in the first allotment, a fee receipt will be issued by the Post Office/can be printed from the Online Payment page, as token of remittance of fee. **Those candidates who do not remit the fee on or before the date prescribed for the same will lose their allotment as well as all the existing options in the stream to which the allotment belongs. Similarly, if candidates who are instructed to join a course based on allotment do not remit the fee and join the college / course, they will lose their allotment as well as all the existing optons in the stream to which the allotment belongs. The options once lost will not be available in the subsequent phases.** The second allotment will be published on the date specified. Candidates who have not received any allotment in the first allotment and who have received an allotment in the second allotment will have to remit the prescribed fee for the course allotted. If a candidate has a different allotment than the one received in the first allotment, the fee for which is higher than that remitted as per the first allotment, he/she will have to remit the difference in fee. The amount to be

remitted in this manner will be shown in the allotment memo of the candidate. If the fee for the course allotted in the second allotment is less than or same as the fee remitted as per the first allotment, no further remittance is to be made by the candidate. The same process will be repeated in the subsequent allotments.

11.6.3 **Admission for all courses**: Candidates allotted to courses, and who remit the fee as prescribed, should take admission in the college allotted as per the schedule prescribed by the CEE. Candidates who do not take admission will lose their allotment as well as all the existing options in the stream to which the allotment belongs. The options once lost will not be available in the subsequent phases. The candidates are liable to pay admission fee as prescribed by the University concerned at the time of admission. If a candidate who got admission in any course, in any allotment of any phase under CAP conducted by the CEE, discontinues the course by taking TC to join another college or course which is not the part of CAP or for any other reasons not related to CAP will lose their allotment as well as all the existing options in the stream to which the allotment belongs. The options once lost will not be available in the subsequent phases.

11.6.4 **Online Option confirmation for participating in subsequent phases of allotment:**
Candidates who are having valid options and who are willing to participate in the second allotment/subsequent allotment have to log in to his/her Option Registration Page and confirm their options by clicking the '**Confirm**' button available in his/her Option Registration Page. Candidates can delete their unwanted options or alter the priority of existing options only after the online option confirmation.

> Online Option confirmation is mandatory before each phase of allotment for participating in that particular phase of allotment. The facility for Online Option confirmation will be made available in the website before each phase of allotment. A candidate who does not confirm the higher order options by clicking the' Confirm' button available in his/her Option Registration Page, his/her higher order options belonging to the course(s) included in that phase will not be available in subsequent phases also. However, his/her existing allotment shall be retained, subject to the conditions of Clauses 11.6.2 and 11.6.3.

(i) After each allotment, the options below the 'allotted one' of the candidate will automatically be removed from the option list of the candidate. For example, if a candidate had registered 45 options in all, and if he/she is allotted his/her 34th option, all options from 35 to 45 will be removed from the option list. Since the 34th option is the allotted one, it will not be seen in the option list. Options from 1 to 33 only will remain valid and will be considered for future allotments.

(ii) If a candidate is satisfied with an allotment and does not want to be considered against his/her remaining options, he/she will have the facility to cancel all the remaining options. He/she may cancel options in a particular stream alone. He/she may also

cancel specific options among the remaining options as per his/her desire. The candidate will also have the facility to alter the priority of the remaining options. But the candidate will not be permitted to register any fresh options to the existing ones.

(iii) The facility for confirmation and cancellation/ deletion/re-arrangement will be available for a specified period of time as notified, after which the facility will be withdrawn. A candidate retaining all or any of the options after each allotment is **bound to accept the next allotment, if any**, given to him/her. If the candidate fails to accept the allotment, he/she will lose all the allotments/ admission and will lose the existing options in the stream to which the latest allotment belongs.

(iv) Forfeiture of the claims in CAP: The claims in Centralised Allotment Process conducted by the CEE will be cancelled under the following reasons.

(a) Non payment of tuition fee as specified in the allotment memo.

(b) Non joining of the course/college within the stipulated time as specified by the CEE.

(c) Discontinued with TC to join courses other than the courses allotted by the CEE or for any other reason.

11.6.5 **Further Allotments**: Details regarding further allotments will be notified by the Commissioner for Entrance Examinations.

11.6.6 **Last Rank Details:** The last rank details of the allotment will be published after each allotment and will be made available on the website. **The last rank given will be the rank of the candidate and not the position in the category list.**

11.6.7 **General Rules related to registering of Options**:

(i) Candidate can register all the available options if he/she desires so. However, it is not compulsory that the candidates should exercise all the options.

(ii) A candidate will not be allotted a seat in a course of a college if he/ she has not opted the course-college combination during option registration process of CAP-2022.

(iii) A candidate is bound to accept an allotment as per the priority registered in the Option list and he/she has to surrender the seat already occupied by him/her, if he/she is allotted based on options furnished against arising/future vacancy. Request to retain the existing admission after an allotment is made, based on the option registered, will not be considered under any circumstances.

(iv) Failure to report for admission in the allotted institution, after remitting the required fee within the stipulated time will result in the forfeiture of his/her allotment to that course and cancellation of all the existing options in the stream to which that allotment belongs.

(vi) For each phase of CAP 2022 subsequent to the initial phase, confirmation of the higher order options by logging in to the Option Registration Page and clicking the '**confirm**' button is mandatory to participate in that phase of allotment even if no cancellation/re-

arrangement of options is desired. Non-confirmation of higher order options for a particular phase of CAP will lead to automatic deletion of higher order options belonging to the course(s) included in that phase, making them unavailable for the subsequent phases also.

11.6.8 **Allotments as per Guidelines**:

Allotment to Engineering, Architecture, B.Pharm, MBBS/BDS, BAMS, BHMS, BSMS, BUMS courses will be regulated in conformity with the guidelines of the Central councils concerned (NMC, DCI, AICTE, Central AYUSH, PCI and CoA).

11.6.9 **Mop-Up Counseling :**Commissioner for Entrance Examinations is authorized to prepare and publish detailed guidelines and conditions of the Mop-up counseling and the subsequent stray vacancy filling phases, depending on the mode of the Mop-up phase (whether online or offline). In case, the mop-up phase is to be conducted offline, there can be strict constraints on the kinds of moves from one course to another course or from one college to another college because of the time constraints on completing the allotment process. The guidelines will be drafted so as to conform to the corresponding guidelines of the central councils concerned (NMC/MCC, Central AYUSH, AICTE, PCI and CoA) as far as possible.

11.7 **Post Allotment Activities:**

11.7.1 **Reporting at the College:** Candidates who get allotment will have to report before the Principal/Head of the Institution concerned for admission on the dates notified with the following documents:

(a) Certificate to prove date of birth.

(b) Transfer Certificate from the Institution last attended and Conduct Certificate.

(c) Original mark list of the qualifying examination (Higher Secondary or equivalent) and the Pass certificate of the qualifying examination (if issued).

(d) Eligibility certificate from any University* in Kerala, in the case of candidates who have passed a qualifying examination other than Higher Secondary Examination/ Vocational Higher Secondary Examination conducted by Government of Kerala or the examination conducted by CBSE and CISCE.

* *Eligibility certificate from Kerala Univeristy of Health Sciences in the case of candidates who have passed a qualifying examination other than Kerala HSE/VHSE/CBSE/CISCE for admission in KUHS affiliated colleges.*

(e) Migration Certificate, if applicable.

(f) Physical Fitness Certificate in the relevant format given in Annexure XVII (a) or XVII (b) of the Prospectus 2022.

(g) Receipt of fee remitted.

(h) Data sheet of KEAM 2022.

(i) Admit card of NEET-UG-2022(if applicable)

(j) Allotment Memo issued by the CEE.

(k)   Any other documents required in the allotment Memo/Notification.

(l)   Originals of all the documents and certificates uploaded with the online application.

Note: Fee/balance fee of the course should be paid at the time of admission to the college itself.

> **The candidate is specifically instructed not to share his/her Password with the institutions concerned.**

11.7.2 **Verification of Documents**: The Principal/Head of the College or Institution shall be personally responsible for verification and satisfaction of the correctness of the documents/Certificates produced by the candidate at the time of seeking admission in the college/institution. The University concerned shall also verify the records produced by the candidate who got admission in the college/institution by deputing special teams and submit a report to Government within 10 days from the last date fixed for final allotment of seats.

11.7.3 **Failure to pay the tuition fee/report for Admission**: Candidates who do not pay the tuition fee or do not take admission on the prescribed date will lose their allotment as well as all the existing options in the stream to which that allotment belongs.

11.7.4 **Cancellation of Higher Options after joining a College**: Candidates who join the college on the dates specified can cancel their remaining options fully or partially or change the priority of their remaining options before the dates prescribed and as specified in clause 11.6.4. A candidate interested in subsequent allotment must login to his/her Option Registration Page and click the '**confirm**' button available therein and can delete their unwanted options or re-arrage the priority of existing options.

11.8   **Seat allotment protocol in Government/Aided/KAU/KVASU/KUFOS Colleges:**

11.8.1 **Admission & Allotment**: A distinction will be made between 'Admission' to a course and seat 'Allotment' to a college. Admissions are offered through allotment of seats under CAP. Allotments will be first offered under State Merit (SM) even to candidates having eligible reservation benefits as per mandatory reservation so long as vacancies are available under the same, statewide. Only after all the 'State Merit' vacancies are exhausted across the State, seats will be offered under the candidate's eligible reservation quotas under mandatory reservation. (Refer Clause 5)

11.8.2 **State-wide Principle of Allotment in Government/Aided/KAU/KVASU/KUFOS Colleges**:
Allotment of seats in Government/Aided/KAU/KVASU/KUFOS Colleges is governed by a 'state-wide' principle of selection approved by the Government of Kerala in G.O.(MS) No.122/98/H.Edn. dated 07.10.1998. According to the G.O., 'Candidates of the reserved category who will otherwise come in the open merit list will be allotted to the college of his choice provided he would have been eligible for allotment to that

college if he was treated as candidate coming under reservation quota. While a reserved category candidate entitled to admission on the basis of his merit will have the option of taking admission to the colleges where a specified number of seats have been kept reserved for reserved category but while computing the percentage of reservation he will be deemed to have been admitted as an open category candidate and not as a reserved category candidate'. As per the above principle, all seats available for allotment by CEE in Government/Aided/KAU/KVASU/KUFOS Colleges for a particular course (Eg:- BAMS under Medical stream or Electronics & Communication under Engineering stream) available in all the Government and Aided colleges put together will be computed state-wide and the total seats so obtained for each course in these Colleges together, will be distributed statewide for the different categories by applying the mandatory reservation principle as mentioned in Clause 4.1.5. While following the above principle of allotment, the institution-wise break-up of seats that is earmarked under each category as per the mandatory reservation principle will be changed in certain colleges.

11.8.3 **Allotment in Government/Aided/KAU/KVASU/KUFOS Colleges to Candidates with multiple Claims under Mandatory Quota:** All candidates included in the Rank Lists are eligible for allotment under State Merit (SM). Candidates might be entitled for other reservation quotas also under Mandatory Reservation. For example, a candidate may have the benefit of SEBC reservation (EZ/MU/BH/LA/DV/VK/KN/BX/KU) or Scheduled Caste (SC) or Scheduled Tribe (ST)/EWS claim. The seats will be offered on the hierarchy of quotas.

The hierarchy in order is as follows:

(i) State Merit (SM) - All candidates included in the Rank Lists are eligible for allotment under State Merit.

(ii) A candidate without SEBC/SC/ST/EWS reservation benefit will be considered only against the 'State Merit' seats wherever available at the time of allotment. Such candidates will be allotted a seat as per the availability of seats.

11.8.4 **Allotments under Special Reservations**: Candidates may be eligible for Special Reservations and/or reservation benefits under 'Persons with Disabilities'. Such allotment will be only to the colleges where the seats have been identified. Allotment under these categories will not be governed by the provisions of the GO referred to in clause 11.8.2. The allotment of seats under Special reservation will be taken up along with the General Allotment. However such candidates will also be considered for allotments as per the Clauses 11.8.2 and 11.8.3, if they are eligible for SEBC/SC/ST/EWS reservation benefits.

11.9 **Seat allotment protocol in Self-financing Colleges:** Allotment of seats in Self-financing colleges will be college/institution wise. Details will be notified separately.

11.10 In case, candidates are directed to appear for a personal counseling at any stage of allotment process and a candidate is not able to attend the allotment process on genuine grounds, the parent/guardian or any authorized person can act as a proxy at the risk of the candidate, on production of authorization letter in the form given in **Annexure XIX**. Authorization letter once received will be considered valid for the entire allotment process, unless the candidate revokes it in writing.

12. FEES

12.1 Fees for the various courses in Govt./Aided Colleges will be as fixed by the Government, from time to time. Fees for the various courses in Self-financing Institutions will be notified separately. The details of fee structure for various courses will be published before the commencement of the CAP 2022. The list of Private Self Financing Institutions which offer additional fee concessions will be published in the official website of the Commissioner for Entrance Examinations, **www.cee.kerala.gov.in** before the commencement of CAP 2022.

12.1.1 Candidates belonging to SC/ST communities allotted against merit seats or against the seats reserved for them are exempted from payment of fees. Candidates belonging to OEC admitted against merit seats or against the un-availed seats of SC/ST are exempted from payment of fee (G.O.(MS) No.14/2005/SCSTDD dated 5.4.2005 & G.O.(Ms) No.36/07/SCSTDD dated 03.07.2007). Candidates belonging to OEC admitted to Government seats through SEBC reservation are also exempted from payment of fee (G.O.(Ms) No. 50/2006/SCSTDD dated 22.09.2006).

(a) **Claim for fee concession to OEC candidates**: Candidates belonging to Other Eligible Communities are exempted from payment of fee at the time of allotment to professional Degree Courses under Government/Community quota as per G.O. (MS) No. 36/07/SCSTDD dated 03.07.2007. Those OEC candidates who have submitted the Non-Creamy Layer Certificate for availing the applicable reservation will be granted the fee concession based on the Non-Creamy Layer Certificate. But those OEC candidates who do not come under Non-Creamy Layer Category should upload the Community Certificate obtained from the village officer to the online application for availing the fee concession. If the community is correctly recorded in SSLC/Educational Certificate of the candidate it can be considered instead of the Community Certificate isuued by the Village Officer.

(b) **Claim for fee concession to the candidates belonging to communities listed in Annexure X (a)**: Candidates belonging to the communities listed in Annexure X (a) whose annual family income is up to Rs.6 lakhs are exempted from payment of fee at the time of allotment to Professional Degree Courses under Government/Community Quota as per G.O.(MS) No. 10/2014/BCDD dated: 23.05.2014. They should upload Community / Non Creamy layer Certificate and Income Certificates from the Village Officer in the prescribed format to the online application. (See Annexure XXVII for proforma). If the community is correctly recorded in SSLC/Educational Certificate of

the candidate it can be considered instead of the Community Certificate isuued by the Village Officer.

12.1.2 Candidates who are children of Inter-Caste married couple of which one is SC/ST, will be eligible for educational and monetary benefits admissible to SC/ST as per GO (MS) No.25/2005/SCSTDD dated 20.6.2005 if they upload the 'Inter-Caste Marriage Certificate' issued by Thahsildar to the online application. (See Annexure XV for proforma)

12.1.3 **Claim for fee concession to the Children of Fishermen (FM)**: Candidates who are children of Registered Fishermen allotted against Merit seats or against the seats reserved for them are exempted from payment of fees to Professional Degree Courses as per G.O.(Ms) No. 47/14/FPD dated: 09.06.2014, if they upload a Certificate in the prescribed format given in Annexure XXXIV from Fisheries Officer concerned of Kerala Fishermen Welfare Fund Board to the online application

12.1.4 **Claim for fee concession to the inmates of Sri Chitra Home, Nirbhaya Home, Juvenile Home:** Candidates who are inmates of Sri Chitra Home, Nirbhaya Home, Juvenile Homes and other institutions run by Government allotted against Merit seats are exempted from payment of fees to Professional Degree Courses as per G.O.(Ms) No. 130/90/H.Edn dated: 31.05.1990. A certificate in this regard from the authority concerned is to be uploaded to the online application for availing the fee concession.

12.2 **Payment of Fees:**

12.2.1 The fee for a course allotted to the candidate will have to be paid within the stipulated time by way of Online Payment or through payment at specified Post Offices in Kerala. If a candidate moves to another course in the same stream, the fee for which is higher than the fees applicable for the course allotted earlier, the balance fee will have to be remitted. Candidates getting fresh allotment also will have to remit the fees applicable. The fee so collected from the candidates will be transferred to the college where the candidate stands admitted at the closing of admissions for the year.

12.2.2 **Refund of fees:**

 (a) **For courses regulated by the AICTE (Engineering and Pharmacy):-** Eligibility for fee refund shall be in accordance with the relevant clauses of the AICTE Approval Process Handbook dealing with refund cases. The existing guidelines in this regard are:

   (i) In the event of a student withdrawing before the start of the class, the entire fee collected from the student, after a deduction of the processing fee of not more than ₹1000/- (Rupees One Thousand only) shall be refunded by the Institution. It would not be permissible for Institutions to retain the School/ Institution Leaving Certificates in original.

   (ii) In case, if a student leaves after the start of the class, and if the vacated seat is consequently filled by another student by the last date of admission, the Institution must refund the fee collected after a deduction of the processing fee of not more than ₹1000/-

(Rupees One Thousand only) and proportionate deductions of monthly fees and hostel rent, where applicable. In case the vacated seat is not filled, the Institution should refund the Security Deposit, if any, collected and return the original documents.

(iii) The Institution should not demand fee for the subsequent years from the students cancelling their admission at any point of time. Fee refund along with the return of Certificates should be completed within 7 days.

(b) **For all courses except the courses regulated by the AICTE**:-Candidates who cancel their admission by obtaining Transfer Certificate before the dates announced by the CEE for the same are eligible for refund of fees.

Note: In the case of fee, if any, to be refunded by the CEE, the refund process will be initiated only after the closing date of admission of all the courses under KEAM-2022. No interest will be paid to the Candidates.

12.2.3 **No refund of fees:**

a) **For courses regulated by the AICTE (Engineering and Pharmacy):-**
AICTE has issued guidelines regarding the conditions under which a candidate who cancels his/her admission is eligible for refund of fees. Please refer clause 12.2.2(a) of this prospectus.

b) **For all courses except the courses regulated by the AICTE:-**

(i) No refund of fees will be made to candidates who apply for Transfer Certificate/ Cancellation of admission under any circumstances, after the last allotment notified by the CEE. They will have to pay Liquidated damages as stipulated in Clause 12.2.4.

(ii) Candidates who do not take admission in the last phase of allotment in the respective courses will not be eligible for refund of fees. They will have to pay Liquidated damages as stipulated in Clause 12.2.4.

12.2.4 **Liquidated damages:**

(a) **Levying amount towards liquidated damages from candidates discontinuing their studies:**

(i) **For courses regulated by the AICTE (Engineering and Pharmacy):-** AICTE has issued guidelines regarding cancellation of admission at various stages. Please refer clause 12.2.2(a) of this prospectus.

(ii) **For all courses except the courses regulated by the AICTE:-**

1. **For MBBS/BDS course:-**

If any candidate admitted against Government Seats in the Government/Self Financing Medical & Dental Colleges allotted by the CEE for MBBS/BDS courses discontinues after the last allotment notified by the CEE in the same academic year, to join other Courses/Colleges or for other purposes, he/she is liable to pay liquidated damages of Rs.10,00,000/- (Rupees Ten Lakhs only) for MBBS course and

Rs.5,00,000/- (Rupees five lakh only) for BDS course, irrespective of annual family income/ nativity/ reservation status and also liable to be debarred from appearing for the Entrance Examinations and/or allotments conducted by the CEE for a period not exceeding two years. In case of failure to remit the penalty, the same is liable to be recovered under the Revenue Recovery Act.

The candidates should execute a bond in the prescribed format shown in the Annexure XXV regarding the payment of Liquidated damages.

2. **For the remaining courses :-**

If any candidate admitted to courses in Government/Aided/Government Cost-Sharing /Private Self Financing colleges, discontinues the studies after the last allotment notified by the CEE in the same academic year, to join other Courses /Colleges or for other purposes, he/she is liable to pay liquidated damages of Rs.75,000/- (Rupees seventy five thousand only). In all such cases the Transfer Certificate will be issued only after remitting the liquidated damages to the admitting authority concerned. Candidates belonging to SC/ST/OEC categories, candidates belonging to 'Keralite' category, as per Clause 6.1 (i), whose annual family income is below Rs.75,000/- and who have uploaded Income Certificate to the online application for admission to Professional Degree Courses 2022, candidates who are transferred from one institution to another as per proceedings of the University concerned and the students admitted in Government/Management seats in Professional Colleges who discontinue their studies to join at any stage of the Course in National Defence Academy/ Naval Academy/ Defence Institutions are exempted from this condition and exempted from payment of liquidated damages.

The candidates should execute a bond in the prescribed format shown in the Annexure XXV regarding the payment of Liquidated damages.

(b) **On discontinuance of a course after the first academic year, liquidated damages shall be collected in the following manner:**

(i) **For courses regulated by the AICTE (Engineering and Pharmacy):**- AICTE has issued guidelines regarding cancellation of admission at various stages. Please refer clause 12.2.2(a) of this prospectus.

(ii) **For all courses except the courses regulated by the AICTE:**- Liquidated damages shall be levied as in Clause 12.2.4 (a)(ii)1 & 2 above or fees for remaining years, whichever is higher, irrespective of annual family income/nativity/ reservation status.

(c) **Penalty for Filing/Retaining unnecessary options:**

(i) **For courses regulated by the AICTE (Engineering and Pharmacy):**-

Candidates who file/retain unnecessary options, but do not take admission on allotment to the Course/College during the final phase of allotment to a course as notified by the CEE, will lose the fee, if any, already paid to the CEE, if the

concerned allotment is conducted after the start of classes and the resulting vacant seats remain unfilled.

(ii) **For all courses except the courses regulated by the AICTE**:- Candidates who file/retain unnecessary options, but do not take admission on allotment to the Course/College during the final phase of allotment to a course as notified by the CEE, resulting in Government seats and Management seats allotted by the CEE to lapse, will be penalized. They will be liable to pay penalty of Rs.10,00,000/- (Rupees Ten Lakhs Only) for MBBS course, Rs. 5,00,000/- (Rupees five lakh only) for BDS course and Rs.50,000/-(Rupees Fifty Thousand Only) for all other courses irrespective of annual family income/nativity/reservation status. Their candidature is also liable to be cancelled and also will be debarred from appearing the Entrance Examinations and/or allotments conducted by the CEE for a period not exceeding two years. In case of failure to remit the penalty, the same is liable to be recovered under the Revenue Recovery Act.

12.2.5 **Refund of Excess amount collected as fee**: The fees collected from candidates will be transferred to the college where the candidate stands admitted on closing of admissions. In case the candidate has moved to a course, the fee for which is lesser than the amount remitted by him/her at the time of the earlier allotment, the excess fee collected will be refunded to the candidate after closing of admissions. The candidates need not submit any individual request in this regard. No interest will be paid to the candidate on the balance amount due to him/her.

13. COURSES, INSTITUTIONS - SPECIAL FEATURES

13.1 Medical Courses under the DME:

(a) The selected candidate should report before the Principal concerned on the date and time as directed by the CEE. No extension of time for joining the course will be granted under any circumstances. Failure to appear before the Principal concerned for admission on the date and time fixed will forfeit his/her selection to the course.

(b) All students getting selected should get themselves vaccinated against Hepatitis, MMR and Chicken pox, before admission. A certificate to this effect will have to be produced at the time of admission.

(c) Students who successfully complete the MBBS course from Medical Colleges in the State, on completion of the MBBS Course, are liable to serve in rural areas. The provisions relating to this stipulation will be as given in appropriate Government orders issued from time to time.

13.2 Ayurvedacharya – BAMS, Siddha- BSMS and Unani- BUMS Courses:

(a) Degree will be awarded only on production of certificate of having successfully completed the prescribed one year internship.

(b) Medium of instruction will be English.

13.3   **Homoeopathy- BHMS Course**:

The degree will be awarded only after successful completion of one year internship as prescribed by the National Council for Homoeopathy.

13.4   Other conditions for the courses under the Kerala Agricultural University/Kerala Veterinary & Animal Sciences University/Kerala University of Fisheries & Ocean Studies:

(a)   **Discontinuance and attendance:** The students will not be allowed to discontinue the course of studies temporarily during the first two semesters. If a student admitted to the first year Under Graduate course does not register for the courses of first semester of that year or having registered, secures less than 80% attendance in 3 or more courses, his/her name shall be removed from the roll.

(b)   The medium of instruction for the above Degree courses will be English.

(c)   All the above courses involve practical fieldwork requiring considerable physical exertion. The candidates who would not be able to do such physical work need not apply.

(d)   The following minimum physical standards are prescribed for BSc. (Hons.) Forestry course.

Gender	Height (cm)	Chest girth (cm)	
		Normal	Expanded
Male	163	79	84
Female	150	74	79

(e)   Candidates selected and sponsored by ICAR and children of persons of Kerala origin settled in Andaman Nicobar Island and Lakshadweep need not produce the nativity certificate for admission to the respective seats reserved for them.

(f)   In the case of in-service candidates, as mentioned in Clause 5, certificate showing the period of service from the head of office in which they are working should be produced.

(g)   Certificates regarding the physical standards/fitness prescribed may be obtained from a Medical Officer in service not below the rank of an Assistant Surgeon in the format as given in **Annexure XVII (a)/XVII (b)** as applicable.

(h)   The physical standards in respect of candidates who have been allotted to BSc.(Hons.) Forestry course will be finally checked by the Kerala Agricultural University before admitting them to the above course.

13.5   **Transfer to other institutions:** Transfer of candidates who are admitted to courses under Kerala University of Health Sciences to other institutions within the University during the course of study and internship will be in accordance with the regulations of Kerala University of Health Sciences.

13.6 **Engineering/Architecture Courses:**

Those candidates who have been allotted to various Engineering/ Architecture courses in the State should produce a Physical Fitness Certificate in the Proforma given in **Annexure XVII (b)** at the time of admission.

Candidates allotted to Engineering/Architecture/B.Pharm Courses will have to get vaccinated against Hepatitis-B, before they take admission in the allotted college, as per AICTE guidelines.

Note: **Tuition Fee Waiver Scheme** will be implemented as per the norms fixed by the AICTE. Son/Daughters of parents whose annual income from all sources does not exeed Rs.8,00,000/- (Rupees Eight Lakhs). The Waiver is limited to the tuition fee and all other fee except Tuition Fee shall have to be paid by the beneficiary. Candidates admitted under Fee Waiver Scheme will not be allowed to change college/course. The implementation of the scheme for Engineering course will be subject to the orders issued by Government of Kerala from time to time.

14. OTHER ITEMS

14.1 The Commissioner for Entrance Examinations will not entertain any request for change of the date of Entrance Examinations or Centralised Allotment Process or enquiries with regard to the date of declaration of the results.

14.2 All disputes pertaining to the examination, selection or admission shall fall within the jurisdiction of the Hon'ble High Court of Kerala.

14.3 Any other items not specifically covered in this prospectus will be decided by the CEE and his decision shall be final.

14.4 **Preventive measures against ragging:**

According to the Kerala Prohibition of Ragging Act, 1998, 'ragging' means doing of any act by disorderly conduct to a student of an educational institution, which causes or is likely to cause physical or psychological harm or raising apprehension or shame or embarrassment to that student and includes teasing or abusing or playing practical jokes or causing hurt to such students or asking a student to do any act or to perform something which such student will not in the ordinary course be willing to do.

All Institutions will have to abide by the directives of the Honourable Supreme Court of India, Dated May 16, 2007 in SLP No.(s) 24295 of 2006 University of Kerala Vs Council, Principals', Colleges, Kerala & Ors [with SLP (C) No.24296-99/2004 & W.P.(Crl) No.173/2006 & SLP (C) No.14356/2005] and the recommendations approved by the Honourable Supreme Court of India on effective prevention of ragging in educational institutions.

In case, the applicant for admission is found to have indulged in ragging in the past or if it is noticed later that he/she has indulged in ragging, admission may be refused or he/she shall be expelled from the educational institution.

It shall be the collective responsibility of the authority of the institution to see to it that effective steps for preventing ragging are taken. Anti-ragging committees and anti-

ragging squads will have to be formed to take effective measures against ragging and they should adhere to the stipulations and effectively monitor and comply with the directives.

Each of the students of the institution and his/her parents, or guardian are required to submit a combined undertaking at the time of registration/admission in prescribed format available in **Annexure - XXII** which is mandatory for registration/admission.

Thiruvananthapuram   Sd/-
Date:25.03.2022   **Commissioner for Entrance Examinations**

SYLLABUS FOR THE ENTRANCE EXAMINATIONS,2022
(See Clause 9.5.1)

MATHEMATICS

UNIT I: ALGEBRA

Sets, Relations and Functions

Sets and their representations: Finite and Infinite sets; Empty set; Equal sets; Subsets; Power set; Universal set; Venn Diagrams; Complement of a set; Operations on Sets (Union, Intersection and Difference of Set); Applications of sets: Ordered Pairs, Cartesian Product of Two sets; Relations, reflexive, symmetric, transitive and equivalence relations. Domain, Co-domain and Range: Functions: into, onto, one - one into, one-one onto Functions; Constant Function; Identity Function; composition of Functions; Invertible Functions; Binary Operations.

Complex Numbers

Complex Numbers in the form $a + i\,b$; Real and Imaginary Parts of a complex Number; Complex Conjugate, Argand Diagram, Representation of Complex Number as a point in the plane; Modulus and Argument of a Complex Number; Algebra of Complex Numbers; Triangle Inequality; $|Z_1 + Z_2| \le |Z_1| + |Z_2|; |Z_1.Z_2| = |Z_1||Z_2|;$ Polar Representation of a Complex Number and square root of a complex number. Solution of a Quadratic Equation in the Complex Number System.

Sequences and Series

Sequence and Examples of Finite and Infinite Sequences; Arithmetic Progression (A..P): First Term, Common Difference, n^{th} Term and sum of n terms of an A.P.; Arithmetic Mean (A.M); Insertion of Arithmetic Means between any Two given Numbers; Geometric Progression (G.P): first Term, Common Ratio and n^{th} term, Sum to n Terms, infinite GP and its sum. Geometric Mean (G.M); Insertion of Geometric Means, Relation between AM and GM. between any two given numbers . Formula for finding the sum of first n natural numbers, sum of the squares of first n natural numbers and sum of the cubes of first n natural numbers.

Permutations, Combinations, Binomial Theorem and Mathematical Induction

Fundamental Principle of Counting; The Factorial Notation; Permutation as an Arrangement; Meaning of P(n, r); Combination: Meaning of C(n,r); Applications of Permutations and Combinations. Statement of Binomial Theorem; Proof of Binomial Theorem for positive integral Exponent using Principle of Mathematical Induction and also by combinatorial Method; General and Middle Terms in Binomial Expansions; Properties of Binomial Coefficients; Binomial Theorem for any Index (without proof); Application of Binomial Theorem. The Principle of Mathematical Induction, simple Applications.

Matrices and Determinants

Concept of a Matrix; Types of Matrices; Equality of Matrices (only real entries may be considered): Operations of Addition, Scalar Multiplication and Multiplication of Matrices;

Statement of Important Results on operations of Matrices and their Verifications by Numerical Problem only; Determinant of a Square Matrix; Minors and Cofactors; singular and non-singular Matrices; Applications of Determinants in finding the Area of a Triangle. Concept of elementary row and column operations. Transpose, Adjoint and Inverse of a Matrix; Consistency and Inconsistency of a system of Linear Equations; Solving System of Linear Equations in Two or Three variables using Inverse of a Matrix (only up to 3X3 Determinants and Matrices should be considered).

Linear Inequalities

Solutions of Linear Inequalities in one variable and its Graphical Representation; solution of system of Linear Inequalities in one variable; Graphical solutions of Linear Inequalities in two variables; solution of system of Linear Inequalities in two variables.

Mathematical Reasoning

 Mathematically acceptable statements and their Negation. Connecting words /phrases consolidating the understanding of if and only if condition, implies, and/or, implied by, there exists.   Validating the statements involving the connecting words, difference among contradiction, converse and contrapositive.

UNIT II : TRIGONOMETRY

Trigonometric functions and Inverse Trigonometric functions

Degree measures and Radian measure of positive and negative angles; relation between degree measure and radian measure, definition of trigonometric functions with the help of a unit circle, periodic functions, concept of periodicity of trigonometric functions, value of trigonometric functions of x for x = 0, $\pi/6$, $\pi/4$, $\pi/3$, $\pi/2$, π, $3\pi/2$, 2π; trigonometric functions of sum and difference of numbers.

$$Sin(x \pm y) = Sin\,x\,Cos\,y \pm Cos\,x\,Sin\,y \quad; \quad Cos(x \pm y) = Cos\,x\,Cos\,y \mp Sin\,x\,Sin\,y \quad; \quad Tan(x \pm y) = \frac{Tan\,x \pm Tan\,y}{1 \mp Tan\,x\,Tan\,y} \quad;$$

$$Sin(2\pi \pm x) = \pm Sinx \,, \quad Cos(2\pi \pm x) = Cosx \quad; \quad Cos(-x) = Cos\,x \,, \quad Sin(-x) = -Sin\,x \quad; \quad Cos\left(\frac{\pi}{2} \pm x\right) = \pm Sin\,x$$

$$Sin\left(\frac{\pi}{2} \pm x\right) = Cos\,x \quad; \quad Cos(\pi \pm x) = -Cosx \,, \quad Sin(\pi \pm x) = \pm Sinx$$

Trigonometric functions of multiple and submultiples of numbers.

$$Sin\,2\,x = 2\,Sin\,x\,Cos\,x \,; \qquad Sin3x = 3\,Sinx - 4\,Sin^3 x \quad; \quad Cos\,2x = Cos^2 x - Sin^2 x = 1 - 2\,Sin^2 x = 2\,Cos^2 x - 1 \,;$$

$$Cos\,3x = 4\,Cos^3 x - 3\,Cos\,x$$

$$Tan\,3x = \frac{3\,Tan\,x - Tan^3 x}{1 - 3Tan^2 x} \quad; \quad Sin\,x + Sin\,y = 2\,Sin\left(\frac{x+y}{2}\right)Cos\left(\frac{x-y}{2}\right)\,; \quad Cos\,x + Cos\,y = 2\,Cos\left(\frac{x+y}{2}\right)Cos\left(\frac{x-y}{2}\right)$$

$$Sin\,x - Sin\,y = 2\,Cos\left(\frac{x+y}{2}\right)Sin\left(\frac{x-y}{2}\right)\,; \quad Cos\,x - Cos\,y = -2\,Sin\left(\frac{x+y}{2}\right)Sin\left(\frac{x-y}{2}\right)$$

Conditional identities for the angles of a triangle, solution of trigonometric equations of the type Sin x = Sin a ; Cos x = Cos a; Tan x = Tan a and equations reducible to these forms. Proofs and simple application of sine and cosine formulae.Inverse Trigonometric functions. Range, domain, principal value branch and graphs of inverse trigonometric functions.

(i) $Sin^{-1}(Sin\ x) = x$ and other similar formula (ii) $Sin^{-1}\left(\frac{1}{x}\right) = Co\sec^{-1} x$ and other similar formula.

$Sin^{-1}(-x) = -Sin^{-1}x$, $Tan^{-1}(-x) = -Tan^{-1}x$; $Co\sec^{-1}(-x) = -Co\sec^{-1}x$, $Cos^{-1}(-x) = \pi - Cos^{-1}(x)$;

$Sec^{-1}(-x) = \pi - Sec^{-1}(x)$, $Cot^{-1}(-x) = \pi - Cot^{-1}(x)$

$Sin^{-1}x + Cos^{-1}x = \frac{\pi}{2}$, $Tan^{-1}x + Cot^{-1}x = \frac{\pi}{2}$; $Co\sec^{-1}(x) + Sec^{-1}(x) = \frac{\pi}{2}$; $Tan^{-1}x - Tan^{-1}y = Tan^{-1}\left(\frac{x-y}{1+xy}\right)$, xy > -1

$Tan^{-1}x + Tan^{-1}y = Tan^{-1}\left(\frac{x+y}{1-xy}\right)$; xy < 1 ; $2\,Tan^{-1}x = Sin^{-1}\left(\frac{2x}{1+x^2}\right) = Cos^{-1}\left(\frac{1-x^2}{1+x^2}\right) = Tan^{-1}\left(\frac{2x}{1-x^2}\right)$, $|x| < 1$

Simple problems

Graph of the following trigonometric functions;

y = Sin x ; y = Cos x ; y = Tan x ; y = a Sin x ; y = a Cos x, y = a Sin bx ; y = a Cos bx;

UNIT III: GEOMETRY

Lines and Family of lines

Cartesian system of coordinates in a plane, shifting of origin. Distance formula, Slope of line, parallel and perpendicular lines. Various forms of equations of a line parallel to axes, slope-intercept form, The Slope point form, Intercept form, Normal form, General form, Intersection of lines. Equation of bisectors of angle between two lines, Angles between two lines, condition for concurrency of three lines, Distance of a point from a line, Equations of family of lines through the intersection of two lines.

Conic sections

Sections of a cone. Circles, standard form of the equation of a circle, its radius and centre. Equations of conic sections [Parabola, Ellipse and Hyperbola] in standard form and simple properties.

Vectors

Vectors and scalars, Magnitude and Direction of a vector, Types of vectors (Equal vectors, unit vector, Zero vector). Position vector of a point, Localized and free vectors, parallel and collinear vectors, Negative of a vector, components of a vector, Addition of vectors, multiplication of a vector by a scalar, position vector of point dividing a line segment in a given ratio, Application of vectors in geometry. Scalar product of two vectors, projection of a vector on a line, vector product of two vectors.

Three-Dimensional Geometry

Coordinate axes and coordinate planes in three dimensional space, coordinate of a point in space, distance between two points, section formula, direction cosines, and direction ratios of a line joining two points, projection of the join of two points on a given line, Angle between two lines whose direction ratios are given, Cartesian and vector equation of a line through (i) a point and parallel to a given vector (ii) through two points, Collinearity of three points, coplanar and skew lines, Shortest distance between two lines, Condition for the intersection of two lines, Cartesian and vector equation of a plane (i) When the normal vector and the distance of the plane from the origin is given (ii) passing through a point and perpendicular to a given vector (iii) Passing through a point and parallel to two given lines through the intersection of two other planes (iv) containing two lines (v) passing through three points, Angle between (i) two lines (ii) two planes (iii) a line and a plane, Condition of coplanarity of two lines in vector and Cartesian form, length of perpendicular of a point from a plane by both vector and Cartesian methods.

Unit IV: STATISTICS

Statistics and probability

Mean deviation, variance, standard deviation for grouped an ungrouped data. Analysis of frequency distributions with equal means but different variances. Random experiments and sample space, Events as subset of a sample space, occurrence of an event, sure and impossible events, Exhaustive events, Algebra of events, Meaning of equality likely outcomes, mutually exclusive events.   Probability of an event; Theorems on probability; Addition rule, Multiplication rule, Independent experiments and events. Finding P (A or B), P (A and B), Bayes' theorem, random variables, Probability distribution of a random variable and its mean and variance. Repeated independent (Bernoulli) trials and Binomial distribution.

UNIT V : CALCULUS

Functions, Limits and continuity

Concept of a real function; its domain and range; Modulus Function, Greatest integer function: Signum functions; Trigonometric functions and inverse trigonometric functions and their graphs; composite functions, Inverse of a function.

Limit of a function; meaning and related notations; Left and right hand limits; Fundamental

$$\lim_{x \to a} \frac{x^n - a^n}{x - a} = na^{n-1}, a > 0; \lim_{x \to 0} \frac{Sin\, x}{x} = 1; \lim_{x \to 0} \frac{e^x - 1}{x} = 1$$

theorems on limits without proof   (without

proof); $\lim_{x \to 0} \frac{\log (1 + x)}{x} = 1$ Continuity of a function at a point, over an open/ closed interval; Sum,

Product and quotient of continuous functions; Continuity of special functions- Polynomial, Trigonometric, exponential, Logarithmic and Inverse trigonometric functions.

Differentiation

Derivative of a function; its geometrical and physical significance; Relationship between continuity and differentiability; Derivatives of polynomial, basic trigonometric, exponential, logarithmic and inverse trigonometric functions from first principles; derivatives of sum, difference, product and quotient of functions; derivatives of polynomial, trigonometric, exponential, logarithmic, inverse trigonometric and implicit functions; Logarithmic differentiation; derivatives of functions expressed in parametric form; chain rule and differentiation by substitution; Derivatives of Second order.

Application of Derivatives

Rate of change of quantities; Tangents and Normals; increasing and decreasing functions and sign of the derivatives; maxima and minima; Greatest and least values; Rolle's theorem and Mean value theorem; Approximation by differentials. Simple problems.

Indefinite Integrals

Integration as inverse of differentiation; properties of integrals; Integrals involving algebraic, trigonometric, exponential and logarithmic functions; Integration by substitution; Integration by parts; Integrals of the type:

$$\int \frac{dx}{x^2 \pm a^2}, \int \frac{dx}{a^2 - x^2}, \int \frac{dx}{\sqrt{x^2 \pm a^2}}, \int \frac{dx}{\sqrt{a^2 - x^2}}, \int \frac{dx}{ax^2 + bx + c},$$

$$\int \frac{px+q}{ax^2 + bx + c} dx, \int \frac{dx}{\sqrt{ax^2 + bx + c}}, \int \frac{px+q}{\sqrt{ax^2 + bx + c}} dx.$$

Integration of rational functions; Partial fractions and their use in integration; Integrals of the type

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

$$\int \frac{dx}{a + b \cos x}, \int \frac{dx}{a - b \sin x}, \int Sin^{-1} x \, dx, \int \log x \, dx.$$

Definite Integrals

Definite integral as limit of a sum; Fundamental theorems of integral calculus without proof; Evaluation of definite integrals by substitution and by using the following properties.

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

$$\int_a^b f(x) \, dx = \int_a^b f(a+b-x) \, dx \; ; \int_0^a f(x) \, dx = \int_0^a f(a-x) \, dx$$

$$\int_a^b f(x) \, dx = \int_a^b f(a+b-x) \, dx \; ; \int_0^a f(x) \, dx = \int_0^a f(a-x) \, dx$$

$$\int_a^b f(x)\,dx = \int_a^b f(a+b-x)\,dx \; ; \int_0^a f(x)\,dx = \int_0^a f(a-x)\,dx$$

$$\int_0^{2a} f(x)\,dx = \int_0^a f(x)\,dx + \int_0^a f(2a-x)\,dx \; ; = \int_0^{2a} f(x)\,dx = 2\int_0^a f(x)\,dx, \; if \; f(2a-x) = f(x)$$

$$\int_0^{2a} f(x)\,dx = 0, \; if \; f(2a-x) = -f(x)$$

$$\int_{-a}^a f(x)\,dx = \begin{cases} 2\int_0^a f(x)\,dx, & if \; f(x) \; is \; even \\ 0 & if \; f(x) \; is \; odd \end{cases}$$

Application of definite integrals in finding areas bounded by a curve, circle, parabola and ellipse in standard form between two ordinates and x-axis; Area between two curves, line and circle; line and parabola: line and ellipse.

Differential Equations

Definition; order and degree; general and particular solutions of a differential equation; formation of differential equations whose general solution is given; solution of differential equations by method of Separation of variables; Homogeneous differential equations of first order and their solutions; Solution of linear differential equations of the type $\dfrac{dy}{dx} + P(x)\,y = Q(x)$ where P (x), Q (x) are functions of x or constants.

Linear Programming

Introduction, related terminology such as constraints, 0bjective function, optimisation, different types of linear programming problems, mathematical formulation of Linear Programming Problems, graphical method of solution for problems in two variables, feasible and infeasible regions, feasible and infeasible solutions, optimal feasible solutions (up to three non-trivial constraints).

PHYSICS

UNIT I: PHYSICAL WORLD AND MEASUREMENT

Physics: Scope and excitement; nature of physical laws; Physics, technology and society.

Need for measurement: Units of measurement; systems of units; SI units, fundamental and derived units. Length, mass and time measurements; accuracy and precision of measuring instruments; errors in measurement; significant figures.

Dimensions of physical quantities, dimensional analysis and its applications.

UNIT II: KINEMATICS

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 and position-time graphs, relations for uniformly accelerated motion (graphical treatment).

Elementary concepts of differentiation and integration for describing motion. Scalar and vector quantities: Position and displacement vectors, general vectors and notation, equality of vectors, multiplication of vectors by a real number; addition and subtraction of vectors. Relative velocity.

Unit vectors. Resolution of a vector in a plane – rectangular components. Scalar and Vector products of Vectors. Motion in a plane. Cases of uniform velocity and uniform acceleration – projectile motion. Uniform circular motion.

UNIT III: LAWS OF MOTION

Intuitive concept of force. Inertia, Newton's first law of motion; momentum and Newton's second law of motion; impulse; 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, lubrication.

Dynamics of uniform circular motion: Centripetal force, examples of circular motion (vehicle on level circular road, vehicle on banked road).

UNIT IV: WORK, ENERGY AND POWER

Work done by a constant force and a variable force; kinetic energy, work-energy theorem, power. Notion of potential energy, potential energy of a spring, conservative forces; conservation of mechanical energy (kinetic and potential energies); non-conservative forces; motion in a vertical circle, elastic and inelastic collisions in one and two dimension

UNIT V: MOTION OF SYSTEM OF PARTICLES AND RIGID BODY

Centre of mass of a two-particle system, momentum conservation and centre of mass motion. Centre of mass of a rigid body; centre of mass of uniform rod, circular ring, disc and sphere. Moment of a force, torque, angular momentum, conservation of angular momentum with some examples. Equilibrium of rigid bodies, rigid body rotation and equation of rotational motion, comparison of linear and rotational motions; moment of inertia, radius of gyration. Values of M.I. for simple geometrical objects (no derivation). Statement of parallel and perpendicular axes theorems and their applications.

UNIT VI: GRAVITATION

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

UNIT VII: PROPERTIES OF BULK MATTER

Elastic behaviour, Stress-strain relationship, Hooke's law, Young's modulus, bulk modulus, shear, modulus of rigidity, poisson's ratio; elastic energy.
Pressure due to a fluid column; Pascal's law and its applications (hydraulic lift and hydraulic brakes).Effect of gravity on fluid pressure.
Viscosity, Stokes' law, terminal velocity, Reynold's number, streamline and turbulent flow. Critical velocity, Bernoulli's theorem and its applications.
Surface energy and surface tension, angle of contact, excess of pressure, application of surface tension ideas to drops, bubbles and capillary rise.
Heat, temperature, thermal expansion; thermal expansion of solids, liquids, and gases. Anomalous expansion. Specific heat capacity: C p , C v – calorimetry; change of state – latent heat.
Heat transfer – conduction and thermal conductivity, convection and radiation.
Qualitative ideas of Black Body Radiation, Wein's displacement law, and Green House effect. Newton's law of cooling and Stefan's law.

UNIT VIII: THERMODYNAMICS

Thermal equilibrium and definition of temperature (zeroth law of Thermodynamics). Heat, work and internal energy. First law of thermodynamics. Isothermal and adiabatic processes.
Second law of thermodynamics: Reversible and irreversible processes.
Heat engines and refrigerators.

UNIT IX: BEHAVIOUR OF PERFECT GAS AND KINETIC THEORY

Equation of state of a perfect gas, work done on compressing a gas. Kinetic theory of gases: Assumptions, concept of pressure.

Avogadro's number. Kinetic energy and temperature; rms speed of gas molecules; degrees of freedom, law of equipartition of energy (statement only) and application to specific heat capacities of gases; concept of mean free path.

UNIT X: OSCILLATIONS AND WAVES

Periodic motion – period, frequency, displacement as a function of time. Periodic functions. Simple harmonic motion (SHM) and its equation; phase; oscillations of a spring – restoring force and force constant; energy in SHM – kinetic and potential energies; simple pendulum – derivation of expression for its time period; free, forced and damped oscillations (qualitative ideas only), resonance.

Wave motion. Longitudinal and transverse waves, speed of wave motion. Displacement relation for a progressive wave. Principle of superposition of waves, reflection of waves, standing waves in strings and organ pipes, fundamental mode and harmonics. Beats. Doppler effect.

UNIT XI: ELECTROSTATICS

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

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

Electric flux, statement of Gauss's theorem and its applications to find field due to infinitely long uniformly charged straight wire, uniformly charged infinite plane sheet and uniformly charged thin spherical shell (field inside and outside).

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

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

UNIT XII: CURRENT ELECTRICITY

Electric current, flow of electric charges in a metallic conductor, drift velocity and mobility, and their relation with electric current; Ohm's law, electrical resistance, V-I characteristics (linear and non-linear), electrical energy and power, electrical resistivity and conductivity. Carbon resistors
 colour code for carbon resistors; series and parallel combinations of resistors;
 temperature dependence of resistance.

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

Kirchhoff 's laws and simple applications. Wheatstone bridge, metre bridge.

Potentiometer – principle and applications to measure potential difference, and for comparing emf of two cells; measurement of internal resistance of a cell.

UNIT XIII: MAGNETIC EFFECTS OF CURRENT AND MAGNETISM

Concept of magnetic field, Oersted's experiment.

Biot - Savart law and its application to current carrying circular loop.

Ampere's law and its applications to infinitely long straight wire, straight and toroidal solenoids. Force on a moving charge in uniform magnetic and electric fields. Cyclotron.

Force on a current-carrying conductor in a uniform magnetic field. Force between two parallel current- carrying conductors – definition of ampere.

Torque experienced by a current loop in a magnetic field; moving coil galvanometer – its current sensitivity and conversion to ammeter and voltmeter.

Current loop as a magnetic dipole and its magnetic dipole moment. Magnetic dipole moment of a revolving electron. Magnetic field intensity due to a magnetic dipole (bar magnet) along its axis and perpendicular to its axis. Torque on a magnetic dipole (bar magnet) in a uniform magnetic field; bar magnet as an equivalent solenoid.

Magnetic field lines; Earth's magnetic field and magnetic elements.

Para-, dia- and ferro - magnetic substances, with examples. Electromagnets and factors affecting their strengths. Permanent magnets.

UNIT XIV: ELECTROMAGNETIC INDUCTION AND ALTERNATING CURRENTS

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

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

AC generator and transformer.

UNIT XV: ELECTROMAGNETIC WAVES

Need for displacement current. Electromagnetic waves and their characteristics (qualitative ideas only). Transverse nature of electromagnetic waves.

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

UNIT XVI: OPTICS

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

Scattering of light – blue colour of the sky and reddish appearance of the sun at sunrise and sunset. Optical instruments: Human eye, image formation and accommodation, correction of eye defects (myopia and hypermetropia) using lenses. Microscopes and astronomical telescopes (reflecting and refracting) and their magnifying powers.

Wave optics: Wavefront and Huygens' principle, reflection and refraction of plane wave at a plane surface using wavefronts. Proof of laws of reflection and refraction using Huygens' principle. Interference, Young's double hole experiment and expression for fringe width, coherent sources and sustained interference of light.

Diffraction due to a single slit, width of central maximum. Resolving power of microscopes and astronomical telescopes.

Polarisation, plane polarised light; Brewster's law, uses of plane polarised light and Polaroids.

UNIT XVII: 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.

UNIT XVIII: ATOMS AND NUCLEI

Alpha - particle scattering experiment; Rutherford's model of atom; Bohr model, energy levels, hydrogen spectrum.

Composition and size of nucleus, atomic masses, isotopes, isobars; isotones. Radioactivity – alpha, beta and gamma particles/rays and their properties; radioactive decay law. Mass-energy relation, mass defect; binding energy per nucleon and its variation with mass number; nuclear fission and fusion.

UNIT XIX: 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, Transistor as a switch (common emitter configuration) and oscillator. Logic gates (OR, AND, NOT, NAND and NOR).

UNIT XX: COMMUNICATION SYSTEMS

Elements of a communication system (block diagram only); bandwidth of signals (speech, TV and digital data); bandwidth of transmission medium. Propagation of electromagnetic waves in the atmosphere, sky and space wave propagation. Need for modulation. Production and detection of an amplitude-modulated wave.

CHEMISTRY

UNIT 1: SOME BASIC CONCEPTS OF CHEMISTRY

General Introduction: Importance and scope of chemistry. Historical approach to particulate nature of matter, laws of chemical combination, Dalton's atomic theory: concept of elements, atoms and molecules. Atomic and molecular masses. Mole concept and molar mass; percentage composition and empirical and molecular formula; chemical reactions, stoichiometry and calculations based on stoichiometry.

UNIT 2: STRUCTURE OF ATOM

Discovery of electron, proton and neutron; atomic number, isotopes and isobars. Thompson's model and its limitations, Rutherford's model and its limitations, Bohr's model and its limitations, concept of shells and subshells, dual nature of matter and light, de Broglie's relationship, Heisenberg uncertainty principle, concept of orbitals, quantum numbers, shapes of s, p and d orbitals, rules for filling electrons in orbitals - Aufbau principle, Pauli exclusion principle and Hund's rule, electronic configuration of atoms, stability of half filled and completely filled orbitals.

UNIT 3: CLASSIFICATION OF ELEMENTS AND PERIODICITY IN PROPERTIES

Significance of classification, brief history of the development of periodic table, modern periodic law and the present form of periodic table, periodic trends in properties of elements – atomic radii, ionic radii, inert gas radii, ionization enthalpy, electron gain enthalpy, electronegativity, valence. Nomenclature of elements with atomic number greater than 100.

UNIT 4: CHEMICAL BONDING AND MOLECULAR STRUCTURE

Valence electrons, ionic bond, covalent bond, bond parameters, Lewis structure, polar character of covalent bond, covalent character of ionic bond, valence bond theory, resonance, geometry of covalent molecules, VSEPR theory, concept of hybridization involving s, p and d orbitals and shapes of some simple molecules, molecular orbital theory of homonuclear diatomic molecules (qualitative idea only). Hydrogen bond.

UNIT 5: STATES OF MATTER: GASES , LIQUIDS AND SOLIDS

Three states of matter, intermolecular interactions, types of bonding, melting and boiling points,role of gas laws in elucidating the concept of the molecule, Boyle's law, Charle's law, Gay Lussac's law, Avogadro's law, ideal behaviour, empirical derivation of gas equation, Avogadro number, ideal gas equation. Kinetic energy and molecular speeds (elementary idea), deviation from ideal behaviour, liquefaction of gases, critical temperature.

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

Solid State - Classification of solids based on different binding forces :molecular, ionic covalent and metallic solids, amorphous and crystalline solids(elementary idea),unit cell in two

dimensional and three dimensional lattices, calculation of density of unit cell, packing in solids, packing efficiency, voids ,number of atoms per unit cell in a cubic unit cell, point defects, electrical and magnetic properties, Band theory of metals ,conductors, semiconductors and insulators and n and p type semiconductors.

UNIT 6: THERMODYNAMICS

Concepts of system, types of systems, surroundings, work, heat, energy, extensive and intensive properties, state functions. First law of thermodynamics – internal energy and enthalpy, heat capacity and specific heat, measurement of ΔU and ΔH, Hess's law of constant heat summation, enthalpy of : bond dissociation, combustion, formation, atomization, sublimation, phase transition, ionization, solution and dilution. Introduction of entropy as a state function, Second law of thermodynamics, Gibbs energy change for spontaneous and non-spontaneous process, criteria for equilibrium. Third law of thermodynamics –Brief introduction.

UNIT 7: EQUILIBRIUM

Equilibrium in physical and chemical processes, dynamic nature of equilibrium, law of mass action, equilibrium constant, factors affecting equilibrium – Le Chatelier's principle; ionic equilibrium – ionization of acids and bases, strong and weak electrolytes, degree of ionization, ionization of polybasic acids, acid strength, concept of pH., Hydrolysis of salts (elementary idea), buffer solutions, Henderson equation, solubility product, common ion effect (with illustrative examples).

UNIT 8 : REDOX REACTIONS AND ELECTROCHEMISTRY

Concept of oxidation and reduction, redox reactions, oxidation number, balancing redox reactions in terms of loss and gain of electron and change in oxidation numbers , applications of redox reactions. Conductance in electrolytic solutions, specific and molar conductivity variations of conductivity with concentration, Kohlrausch's Law, electrolysis and laws of electrolysis (elementary idea), dry cell – electrolytic cells and Galvanic cells; lead accumulator, EMF of a cell, standard electrode potential, Nernst equation and its application to chemical cells. Relation between Gibbs energy change and EMF of a cell, fuel cells; corrosion.

UNIT 9 : SOLUTIONS

Types of solutions, expression of concentration of solutions of solids in liquids, solubility of gases in liquids, solid solutions, colligative properties – relative lowering of vapour pressure, Raoult's law , elevation of B.P., depression of freezing point, osmotic pressure, determination of molecular masses using colligative properties, abnormal molecular mass, Vant Hoff factor.

UNIT 10: CHEMICAL KINETICS

Rate of a reaction (average and instantaneous), factors affecting rates of reaction: concentration, temperature, catalyst; order and molecularity of a reaction; rate law and specific rate constant, integrated rate equations and half life (only for zero and first order reactions);

concept of collision theory (elementary idea, no mathematical treatment).Activation energy, Arrhenious equation.

UNIT 11: SURFACE CHEMISTRY

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

UNIT 12: HYDROGEN AND S- BLOCK ELEMENTS (ALKALI AND ALKALINE EARTH METALS)

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

Group 1 and Group 2 elements: General introduction, electronic configuration, occurrence, anomalous properties of the first element of each group, diagonal relationship, trends in the variation of properties (such as ionization enthalpy, atomic and ionic radii), trends in chemical reactivity with oxygen, water, hydrogen and halogens; uses. Preparation and Properties of Some Important Compounds: Sodium carbonate, sodium chloride, sodium hydroxide and sodium hydrogencarbonate, biological importance of sodium and potassium. CaO, $CaCO_3$, and industrial use of lime and limestone, biological importance of Mg and Ca.

UNIT 13: P-BLOCK ELEMENTS

General Introduction to p-Block Elements

Group 13 elements: General introduction, electronic configuration, occurrence, variation of properties, oxidation states, trends in chemical reactivity, anomalous properties of first element of the group; Boron- physical and chemical properties, some important compounds: borax, boric acids, boron hydrides. Aluminium: uses, reactions with acids and alkalies.

Group 14 elements: General introduction, electronic configuration, occurrence, variation of properties, oxidation states, trends in chemical reactivity, anomalous behaviour of first element. Carbon - catenation, allotropic forms, physical and chemical properties; uses of some important compounds: oxides. Important compounds of silicon and a few uses : silicon tetrachloride, silicones, silicates and zeolites, their uses.

Group 15 elements: General introduction, electronic configuration, occurrence, oxidation states, trends in physical and chemical properties; nitrogen – preparation, properties and uses; compounds of nitrogen: preparation and properties of ammonia and nitric acid, oxides of nitrogen (structure only); Phosphorous-allotropic forms; compounds of phosphorous: preparation and properties of phosphine ,halides (PCl_3, PCl_5) and oxoacids (elementary idea only).

Group 16 elements : General introduction, electronic configuration, oxidation states, occurrence, trends in physical and chemical properties; dioxygen: preparation, properties and uses; classification of oxides; ozone. Sulphur – allotropic forms; compounds of sulphur: preparation, properties and uses of sulphur dioxide; sulphuric acid: industrial process of manufacture, properties and uses, oxoacids of sulphur (structures only).

Group 17 elements : General introduction, electronic configuration, oxidation states, occurrence, trends in physical and chemical properties; compounds of halogens: preparation, properties and uses of chlorine and hydrochloric acid, interhalogen compounds, oxoacids of halogens (structures only).

Group 18 elements: General introduction, electronic configuration, occurrence, trends in physical and chemical properties, uses.

UNIT 14: D AND F BLOCK ELEMENTS

General introduction ,electronic configuration, occurrence and characteristics of transition metals, general trends in properties of the first row transition metals – metallic character, ionization enthalpy, oxidation states, ionic radii, colour, catalytic property, magnetic properties, interstitial compounds, alloy formation. Preparation and properties of $K_2Cr_2O_7$ and $KMnO_4$. Lanthanoids – electronic configuration, oxidation states, chemical reactivity and lanthanoid contraction and its consequences. Actinoids – Electronic configuration, oxidation states and comparison with lanthenoids .

UNIT 15: COORDINATION COMPOUNDS

Coordination compounds : Introduction, ligands, coordination number, colour, magnetic properties and shapes, IUPAC nomenclature of mononuclear coordination compounds, bonding, Werner's theory VBT,CFT; isomerism (structural and stereo)importance of coordination compounds (in qualitative analysis, extraction of metals and biological systems).

UNIT 16: GENERAL PRINCIPLES AND PROCESSES OF ISOLATION OF ELEMENTS

Principles and methods of extraction – concentration, oxidation, reduction electrolytic method and refining; occurrence and principles of extraction of aluminium, copper, zinc and iron.

UNIT 17: ORGANIC CHEMISTRY – SOME BASIC PRINCIPLES AND TECHNIQUES

General introduction, methods of purification, qualitative and quantitative analysis, classification and IUPAC nomenclature of organic compounds. Electronic displacements in a covalent bond: inductive effect, electromeric effect, resonance and hyper conjugation. Homolytic and heterolytic fission of a covalent bond: free radicals, carbocations, carbanions; electrophiles and nucleophiles, types of organic reactions.

UNIT 18: HYDROCARBONS

Classification of Hydrocarbons. Aliphatic Hydrocarbons: Alkanes – Nomenclature, isomerism, conformations (ethane only), physical properties, chemical reactions including free radical mechanism of halogenation, combustion and pyrolysis. Alkenes – Nomenclature, structure of double bond (ethene), geometrical isomerism, physical properties, methods of preparation; chemical reactions: addition of hydrogen, halogen, water, hydrogen halides (Markovnikov's addition and peroxide effect), ozonolysis, oxidation, mechanism of electrophilic addition. Alkynes – Nomenclature, structure of triple bond (ethyne), physical properties, methods of preparation, chemical reactions: acidic character of alkynes, addition reaction of - hydrogen, halogens, hydrogen halides and water. Aromatic hydrocarbons – Introduction, IUPAC nomenclature; Benzene: resonance, aromaticity ; chemical properties: mechanism of electrophilic substitution – nitration sulphonation, halogenation, Friedel Craft's alkylation and acylation; directive influence of functional group in mono-substituted benzene; carcinogenicity and toxicity.

UNIT 19: HALOALKANES AND HALOARENES

Haloalkanes: Nomenclature, nature of C-X bond, physical and chemical properties, mechanism of substitution reactions. Optical rotation. Haloarenes: Nature of C-X bond, substitution reactions (directive influence of halogen for monosubstituted compounds only). Uses and environmental effects of – dichloromethane, trichloromethane, tetrachloromethane, iodoform, freons, DDT.

UNIT 20: ALCOHOLS, PHENOLS AND ETHERS

Alcohols: Nomenclature, methods of preparation, physical and chemical properties (of primary alcohols only); identification of primary, secondary and tertiary alcohols; mechanism of dehydration, uses, with special reference to methanol and ethanol. Phenols : Nomenclature, methods of preparation, physical and chemical properties, acidic nature of phenol, electrophillic substitution reactions, uses of phenols. Ethers : Nomenclature, methods of preparation, physical and chemical properties, uses.

UNIT 21: ALDEHYDES, KETONES AND CARBOXYLIC ACIDS

Aldehydes and Ketones: Nomenclature, nature of carbonyl group, methods of preparation, physical and chemical properties, and mechanism of nucleophilic addition, reactivity of alpha hydrogen in aldehydes; uses. Carboxylic Acids: Nomenclature, acidic nature, methods of preparation, physical and chemical properties; uses.

UNIT 22: ORGANIC COMPOUNDS CONTAINING NITROGEN

Amines: Nomenclature, classification, structure, methods of preparation, physical and chemical properties, uses, identification of primary secondary and tertiary amines. Cyanides and Isocyanides – will be mentioned at relevant places in context. Diazonium salts: Preparation, chemical reactions and importance in synthetic organic chemistry.

UNIT 23: BIOMOLECULES

Carbohydrates – Classification (aldoses and ketoses), monosaccharide (glucose and fructose), D-L configuration, oligosaccharides (sucrose, lactose, maltose), polysaccharides (starch, cellulose, glycogen): importance. Proteins - Elementary idea of a - amino acids, peptide bond, polypeptides, proteins, primary structure, secondary structure, tertiary structure and quaternary structure (qualitative idea only), denaturation of proteins; enzymes. Hormones –Elementary idea (excluding structure). Vitamins – Classification and functions. Nucleic Acids: DNA and RNA

UNIT 24: POLYMERS

Classification – Natural and synthetic, methods of polymerization (addition and condensation), copolymerization. Some important polymers: natural and synthetic like polythene, nylon, polyesters, bakelite, rubber. Biodegradable and non-biodegradable polymers.

UNIT 25: CHEMISTRY IN EVERYDAY LIFE

1. Chemicals in medicines – analgesics, tranquilizers, antiseptics, disinfectants, antimicrobials, antifertility drugs, antibiotics, antacids, antihistamines. 2. Chemicals in food – preservatives, artificial sweetening agents, elementary idea of antioxidants. 3. Cleansing agents – soaps and detergents, cleansing action.

UNIT 26: ENVIRONMENTAL CHEMISTRY

Environmental pollution – Air, water and soil pollution, chemical reactions in atmosphere, smogs, major atmospheric pollutants; acid rain, ozone and its reactions, effects of depletion of ozone layer, greenhouse effect and global warming – pollution due to industrial wastes; green chemistry as an alternative tool for reducing pollution, strategy for control of environmental pollution.