PROSPECTUS FOR B.TECH LATERAL ENTRY COURSE – 2021-2022

Approved vide G.O.(Rt)No.1235 /2021 /HEDN. Dated, Thiruvananthapuram, Dated.17.09.2021

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1. Introduction

Lateral Entry Scheme is intended to admit meritorious Diploma/ D.Voc/ B.Sc holders to the Third Semester of the B. Tech courses to acquire a Degree in Engineering. Lateral Entry Scheme is approved by Government of Kerala as per G.O (MS) No.156/2002/H.Edn dated: 13.11.2002 and G.O(Rt)No.1305/2019/H.Edn dated 26.07.2019 for 10% of the sanctioned seats, which shall be over and above supernumerary in addition to total seats plus the unfilled vacancies of the first year (lapsed seats of first year). A state level Entrance Examination for the selection is suggested to maintain uniformity among various schemes of Diploma / D.Voc / B.Sc holders.

2. Institutions, Courses and Intake

The list of various Engineering colleges, the courses/ branches offered and the number of seats available in each branch will be published in the website - **www.admissions.dtekerala.gov.in** before the ensuing online allotment.

3. Fee Structure

Fee for the various courses in Government/ Aided/ Government controlled/ Private Self financing Colleges will be as fixed by the Government from time to time. Students will be liable to pay the fees and all other charges as per statutes. Fees structure of various courses in Government/ Aided Engineering (merit seats) colleges are given in annexure A of the prospectus.

4. Eligibility for admission

4.1 Candidates who have passed three year Diploma in Engineering/ Technology, D.Voc awarded from State Board of Technical Education / Universities or Institutions under Govt. of India, or undergoing studies at AICTE approved institutions and candidates who have passed B.Sc degree with Mathematics as their main or subsidiary subject from a recognized university as defined by the UGC are eligible to apply for the Lateral Entry Test subject to fulfilling the requirements of minimum marks as contained clauses 4.6, 4.7 and 4.8 respectively.

4.2 The admission will be subject to regulations prescribed in the prospectus for B.Tech lateral entry course 2020-21, and of the Universities concerned.

4.3 Applicants should have completed 18 years of age as on the 31st December 2021. No relaxation in the minimum age will be allowed. However there is no upper age limit.

4.4 Only Indian citizens are eligible to apply in all categories of seats in B.Tech (LET) admission. The admission of non-Keralites will be restricted to the management quota seats in Private Self-Financing engineering colleges and Management seats in the Government controlled engineering colleges.

4.5 Diploma/ DVoc candidates will be admitted only to the branch of Engineering as per the equivalency given in Annexure B.

4.6 Candidates who have passed diploma in Engineering/ Technology with at least 45% marks (42% in the case of candidates belonging to SEBC and OEC category and 40% in the case of candidates belonging to SC/ST category) are eligible for writing the entrance examination. Candidates should produce a certificate showing the duration of the course and the details of the certificate issuing authority properly authenticated by the head of the institution concerned in the space provided in the body of the application form if the same is not specifically stated in the certificate or mark list of the Diploma stream examination.

4.7 Candidates who have passed D.Voc (Vocational Diploma) stream in the same and allied sector in Engineering /Technology with at least 45% marks (42% in the case of candidates belonging to SEBC and OEC category and 40% in the case of candidates belonging to SC/ST category) are eligible for writing the entrance examination. Candidates should produce a certificate showing the duration of the course and the details of the certificate issuing authority properly authenticated by the head of the institution concerned on the space provided on the body of the application form if the same is not specifically stated in the certificate or mark list of the D.Voc stream examination.

4.8 Candidates who have passed B Sc degree with Mathematics as their main or subsidiary subject with at least 45% marks (42% in the case of candidates belonging to SEBC and OEC category and 40% in the case of candidates belonging to SC/ST category) and passed 10+2 examination with Mathematics as a subject are also eligible for writing the entrance examination. Candidates should produce a certificate showing the duration of the course and the details of the certificate issuing authority properly authenticated by the head of institution concerned, on the space provided in the body of application form if the same is not specifically stated in the certificate or mark list of the B.Sc stream examination.

4.9 Those who are appearing for the Final year of Diploma stream / D.Voc stream / B.Sc stream Examination and satisfying the above criteria are also eligible to apply, subject to the condition that they will produce the Qualifying Certificate (original or Provisional) at the time of admission. All such candidates should produce a certificate showing the duration of the course with the details of the certificate issuing authority and properly authenticated by the head of institution concerned, in the space provided in the body of the application form.

4.10 The students belonging to B.Sc stream shall clear the subject i) Engineering Graphics/ Engineering Drawing and ii) Engineering Mechanics of the First year Engineering programme along with the second year subjects.

4.11 The students belonging to B.Sc stream shall be considered only after filling the supernumerary and the unfilled vacancies of the first year B.Tech / BE, with students belonging to the Diploma stream and D.Voc stream.

4.12 Candidates who have acquired/are acquiring the eligibility for qualifying from Board/University outside Kerala State or Board/University outside India should produce equivalency certificate from Directorate of Technical Education/ Universities in Kerala. For diploma / D.Voc eligibility shall be from Directorate of Technical Education and for Degree it shall be from any of the Universities in Kerala.

4.13 **Certificates to prove Nativity**

Keralites: In order to prove that candidate is an Indian Citizen of Kerala origin for the limited purpose of eligibility for admission, he/she should produce one of the following certificates along with the print out of the application itself.

i) The true copy of the relevant page of Secondary School Leaving Certificate of the candidate showing the place of birth in Kerala. OR

ii) The true copy of the relevant page of the Secondary School Leaving Certificate of either of the parents of the candidate showing Place of Birth in Kerala with corroborative certificate to establish the relationship between the parent and the candidate. OR

iii) The true copy of the relevant page of the Passport of the candidate, issued by Government of India, showing Place of Birth in Kerala, or of either of the parents of the candidate showing Place of Birth in Kerala with corroborative certificate to establish the relationship between the parent and the candidate.

OR

iv) A certificate of birth from the authority competent to register birth (Panchayat/ Municipality/ Corporation) showing the candidate's or either parent's (in which case corroborative certificate to establish the relationship between the parent and the candidate is necessary) place of birth in Kerala, to be issued by a competent registering authority. OR

v) A certificate from the Village Officer/ Tahsildar to show that the candidate or his/her father/mother was born in Kerala (This is to be obtained in the prescribed format along with the printout of the application).

OR

vi) A Certificate from the competent authority showing that the parent of the candidate is an All India Service officer allotted to Kerala cadre.

5. Reservation of seats

5.1 All seats under Lateral Entry scheme will be filled from the common rank list prepared by the Director of technical Education, Kerala for the LET Admission 2021

5.2 In Government Engineering Colleges all seats under Lateral Entry scheme will be allotted as Government seats.

5.3 15% of seats under Lateral Entry are reserved as Management seats in Aided Engineering Colleges and remaining 85% will be allotted as Government seats.

5.4 The availability of Government seats in Government controlled and other Private Self-Financing Engineering Colleges will be announced before the ensuing online admission.

5.5 Reservation of Seats for Economically Weaker Sections in general category: As per the G.O (P) No.2/2020/P& ARD dated 12.02.2020, Government have decided to implement reservation for Economically Weaker Sections in general category (EWS) to all Higher educational institutions other than minority institutions, where reservation to other backward classes are provided. In the case of courses/institutions, for which the additional seats required for implementation of EWS quota are not already sanctioned by the concerned Central Council, the institution wise breakup under EWS quota will be notified separately as and when the required additional seats are sanctioned.

5.6 Communal reservation for candidate belonging to Socially and Educationally Backward Classes (SEBC) and SC/ST category will be followed as per Government norms. Detailed list of communities under these categories are included in Annexure E, F, G, G (a), and H. The percentage break up of seats as per mandatory reservation is as follows:

(A) State Merit (SM) - 50%
(B) Economically weaker sections in General Category (EWS) -10%
(C) Socially and Educationally Backward Classes (SEBC) -30%

a. Ezhava (EZ) - 9%
b. Muslim - 8%
c. Other Backward Hindu (BH) - 3%
d. Latin Catholics and Anglo Indian (LA) - 3%
e. Dheevara and related communities (DV - 2%
f. Viswakarma and related communities (VK) - 2%
g. Kusavan and related communities - 1%
h. Other Backward Christian (BX) - 1%
i Kudumbi - 1%

(D) SC/ST category (Annexure E&F) - 10%
a. Scheduled Castes - 8%
b. Scheduled Tribes - 2%

5.7 5% seats are reserved for differently abled candidates (persons with disabilities). Candidates claiming reservation under this quota shall have a minimum of 40% disability. A disability certificate from the District Medical Board has to be attached along with the application. Such candidates are also directed to produce a certificate obtained from a Medical officer not below the rank of Assistant Surgeon to ensure the fitness of candidates to undergo the course at the time of admission.

5.8 One seat each is reserved for Electronics and Communication Engineering, Electrical & Electronics Engineering, Civil Engineering, Mechanical Engineering, Computer Science & Engineering, and Information Technology branch for the children of serving defense personal (SD)/ para military force personal (RP) . For claiming reservation in this quota, the certificate obtained from the concerned authority not earlier than six month from the last date of receipt of application in the prescribed format (Annexure I) provided in the body of the application form is to be produced. If seats remain vacant in the above category (SD/RP) for want of eligible applicants, applications from the children of Ex-servicemen or an ex-serviceman himself/herself (XS) shall be considered. For claiming reservation in this quota, the certificate obtained from concerned authorities in the prescribed format (Annexure J) provided in the body of the application form is to be produced. This certificate should clearly show that the benefit of reservation has not been granted earlier to any member in the family.

6. Claim for Communal Reservation:

6.1 Candidates belonging to SEBC and not included in the category of creamy layer are eligible for reservation under this category. Those Candidates claiming reservation under SEBC category should produce non creamy layer certificate obtained from the concerned village officer/ Thahsildar in the space provided in the body of the application form.

6.2 The candidates claiming reservation under SC/ST quota should produce community certificate from the concerned Thahsildar in the space provided in the body of the application form.

6.3 In the absence of SC/ST candidates, their seats will be filled from OEC category as per the Annexure-F of the prospectus, and they have to furnish community and Non creamy layer certificates from the Village Officer in the space provided in the body of the application form.

6.4 Candidates belonging to the communities listed in Annexure - G(a) of the prospectus, whose annual family income is less than Rs 6 lakhs or as decided by Government from time to time are exempted from payment of fee vide G.O(Ms) no:10/2014/BCDD dated 23.05.2014. These candidates should provide community and income certificates from the Village Officer in the prescribed format along with the printout of the application at the time of admission.

6.5 EWS category should produce EWS certificate in the prescribed format as per the G.O (P) No.2/2020/P& ARD dated 12.02.2020, issued by the village Officer.

Note: i) The Certificate issued by the e-District portal of the Government of Kerala will be preferred in lieu of the respective certificates.

(ii) Validity Period of Community, Non Creamy Layer and Income certificates will be as per the relevant guidelines of the revenue department.

7. TUITION FEE WAIVER SCHEME (TFW)

There are a maximum of 5% seats supernumerary in nature under Tuition Fee Waiver (TFW) scheme. It is provided to women, physically handicapped and Other Eligible (Economically weak) students from any of the background (GEN/OBC/SC/ST) to be admitted in Degree program of the institute.

Following are main features of the Scheme:

7.1 Sons and daughters of parents (Father and Mother both) whose annual income is up to Rs 8.00 lakhs from all sources shall only be eligible.

7.2 The waiver is limited to the Tuition Fee only. All other fee (except Tuition Fee) will have to be paid by the beneficiary student.

7.3 Applications are invited during registration; but shall be taken into consideration after completion of second phase of document verification. The beneficiary student admitted under this scheme shall not be allowed to change the course (Branch/Discipline) under any circumstances.

7.4 The scheme shall come into effect once 30% seats of sanctioned seats are filled and the institute is able to fill supernumerary seats as per scheme. Students who want to avail the scheme must get the income certificate from the competent authority issued on or after 31.03.2021.

8. Application Forms:

Application forms and prospectus are available in the websites **www.admissions.dtekerala.gov.in** and **www.tekerala.org**. **Application fee is Rs.750/- for general candidates and Rs.375/- for SC/ST candidates, which can be paid in 'SHAKTI ACCOUNT' of THE JOINT CONTROLLER OF TECHNICAL EXAMINATION at any branch of State Bank of India**.

9. **Submission of Application**:

Online application form is available in the website www.tekerala.org. Application along with supporting documents has to be submitted online. Application or supporting documents submitted by any other means will not be considered. All the mandatory and supporting documents must be uploaded through the uploads section of the online application form. The schedule and the detailed step-by-step procedure for submitting the online application form will be notified separately.

10 Entrance Examination:

10.1 A State level OMR based objective type Entrance Examination for duration of two hours will be conducted by The Joint Controller of Technical Examinations, Kaimanam, Thiruvananthapuram. for the selection.

10.2 Examination centers will be at Thiruvananthapuram, Kollam, Alappuzha, Pathanamthitta, Kottayam, Thodupuzha, Ernakulam, Thrissur, Palakkad, Tirur, Malappuram, Sulthan Bathery, Kozhikode, Kannur & Kasaragod. Admit Cards for the Examination can be downloaded from websites:
www.admissions.dtekerala.gov.in
www.tekerala.org.

10.3 The Entrance Examination will be as per the syllabus based on First year B.Tech curriculum of Kerala Technological University (KTU). The syllabus for the entrance examination is included as Annexure K. The rank list will be published by The Director of Technical Education Thiruvananthapuram.

10.4 The Rank List shall be prepared with all the candidates in the order of marks secured in the Entrance examination, except those who secure Zero. There is no negative mark in the valuation of answer scripts of entrance examination. For every correct answer candidates will get one mark and no reduction of mark (negative mark) for the wrong answers.

10.5 After the completion of the second allotment and its admission procedures, if seats remain vacant, a centralized spot admission will be conducted on a suitable date as fixed later. All candidates in the rank list published by the Director of Technical Education, Kerala are eligible to appear for the centralized spot admission. Those who are admitted in any institutions through centralized allotment can appear for centralized spot admission without NOC from the principals of respective institutions. All other candidates should produce the original certificate/mark lists at the time of admission. The principals of concerned institutions should issue TC and release all certificates and other relevant documents of candidates who obtained allotment through centralized spot admission, without any delay. Candidates selected for admission through centralized spot admission will have to join the respective institutions on the date specified, by remitting the required fees at the respective institutions.

In case of practical difficulties in conducting a centralized spot admission, an online mop-up allotment will be conducted in which all the candidates in the rank list can take part.

10.6 If seats remain vacant even after the centralized spot admission or the online mop-up allotment, as the case may be, the heads of the institutions are permitted to admit the candidates from the rank list prepared by the Director of Technical Education, Kerala, through institutional level spot admissions by giving wide publicity in the media. Through this clause, institutions can fill vacant seats up to the last date of closing admission, which will be decided by the Director of Technical Education, Kerala.

10.7 The institutional level spot admissions will be conducted only after the conduct of all phases of the

Centralized Online Allotments followed by the centralized spot admission or online mop-up counseling, as the case may be.

11 Valuation and Declaration of Results:

11.1 A fully computerized system has been adopted for the valuation of the answer scripts using Optical Mark Reader (OMR) system and for the results.

11.2 The rank list shall be prepared as per the criteria given in Annexure D. The marks secured by the candidates will not be disclosed under any circumstances and any such enquiries will not be entertained.

11.3 There will be no provision for revaluation or rechecking of the answer scripts or recounting of the marks.

12 Allotment:

12.1 The allotment of seats will be made by the Director of Technical Education, Kerala, on the basis of the rank list published and availability of seats in the various categories through the website **www.admissions.dtekerala.gov.in**, according to the options given by the candidates.

12.2 Allotment Memo will be published in the website for download. No duplicate Memo will be issued in any case after allotment.

12.3 Candidates who are eligible for allotment on the basis of the Rank List will have to enter their options online. After each allotment there will be provision for rearranging the options.

12.4 Once the candidate gets an allotment, he/ she will have to join the particular institution and then only he/ she will be considered for further allotments. Otherwise his/ her candidature will be cancelled.

12.5 Once the candidate gets an allotment, all the lower options will automatically be cancelled and re-allotment will only be done for higher options. The candidate, who got the higher option in subsequent allotment, must be issued TC from previous institution, and the arising vacancy has to be reported to the Directorate of Technical Education.

12.6 If the candidate is satisfied with the allotment he/she gets in a particular allotment and if he/she does not want to be considered for further allotments, he/ she will have to cancel all the remaining options.

12.7 The selection for admission will be provisional and subject to the verification of the original documents by the concerned Principals at the time of admission.

12.8 Any other details not specifically covered by the clauses given in the prospectus will be decided by the undersigned and her decision will be final. She is also empowered to cancel any admission found to be illegal subsequent to the admission.

12.9 All disputes pertaining to the Examination or admission shall fall within the jurisdiction of the Honorable High Court of Kerala.

13 No Liquidated damages

As per G.O (Rt)No.77/2019/H.Edn dated 18.01.2019, there will be no liquidated damages as the clause of chapter 8.13 of AICTE approval process Hand Book 2020-21 stated as follows:

13.1 In the event of a student withdrawing before the start of the course, the entire fee collected from the student, after a deduction of the processing fee of not more than Rs.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.

13.2 In case, if a student leaves after joining the course and if the vacated seat is consequently filled by another student before the last date of admission, the institution must refund the fee collected after deducting of processing fee not more than Rs.1000/- (Rupees One thousand only) and proportionate deductions of monthly fees and hostel rent, where applicable.

13.3 In case the vacated seat is not filled, the Institution should refund the Security Deposit and return the original documents.

13.4 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 seven days.

13.5 Institutions not following the guidelines issued by the Council regarding refund of fee for cancellation of admission or delaying refunds shall be liable to any one or more of the following punitive actions by the Council.

* Fine for non-compliance of refund rules of the fee levied against each case shall be five times the total fee collected per student.
* Suspension of approval for NRI and Supernumerary seats, if any, for one Academic Year.
* Reduction in "Approved Intake"
* No admission in one /more course(s) for one academic Year/ Withdrawal of approval for program(s)/course(s)

Sd/-

Thiruvananthapuram **Director of Technical Education**

Date:09.09.2021

ANNEXURE A

FEES FOR THE VARIOUS COURSES IN GOVERNMENT/ AIDED COLLEGES

Fee component	**Amount**	**Remittance**
Admission Fee	Rs.240/-	At the time of admission only
Tuition Fee	Rs.3150/- per semester	Beginning of each semester
Special Fee (Revenue Rs.1740/- and P.D Rs.370/-)	Rs.2110/- per year	Beginning of odd semester
University Fee (Administration fee - Rs.1000/- at the time of admission. Sports and Athletic fee- Rs.500/-at the time of admission Exam fee - Rs. 500/- Subject fee - Rs.1200/-)	3200/-	Rs 1500/-at the time of admission and Rs.1700/- at the beginning of each semester.
Caution deposit	Rs.1000/-	At the time of admission only
Miscellaneous	Rs.25	At the time of admission only
Total	**Rs.9725 /-**	

ANNEXURE B - EQUIVALENCY OF BRANCHES

NO	Specialization in Diploma / DVoc Course	Branch Equated to B.Tech Course
1	Applied Electronics/Instrument Technology/ Electronicsand Instrumentation/ Medical Electronics /Instrumentation Technology/ Instrumentation Engineering	Electronics and Communication Engg./ Applied Electronics and Instrumentation Engg/ Instrumentation and Control Engg./ Electronics and Instrumentation Engineering
2	Architecture	Civil Engineering
3	Civil	
4	Quantity Survey & Construction Management	
5	Biomedical Engineering/ Medical Electronics/ Medical Instrumentation	Bio Medical Engineering/ Electronics and Communication Engineering/ Applied Electronics and Instrumentation Engineering
6	Biotechnology/Chemical/Polymer Technology	Chemical Engineering/ Polymer Technology/ Biotechnology /Biotechnology and Bio chemical Engineering
7	Computer Application and Business Management	Computer Science and Engineering
8	Computer Engineering, Computer Science	
9	Computer Hardware Maintenance/ Computer Hardware Engineering	
10	Information Technology	
11	Information Technology	Information Technology (In the absence of Information Technology, other branches will be considered)
12	Electrical /Electrical & Electronics Engineering	Electrical and Electronics Engineering
13	Electronics Engineering/ Computer Engineering Computer Hardware Maintenance	Electronics and Communication Engineering
14	Electronics and Communication Engineering	
15	Electronics Production Technology	
16	Telecommunication Technology	
17	Electronics and Avionics Engineering	Electronics and Communication Engineering / Aeronautical Engineering

18	Automobile Engineering	Mechanical engineering/ Automobile Engineering Mechanical (Automobile) Engineering
19	Tool and Die	Mechanical Engineering/ Industrial Engineering/ Production Engineering/ Mechanical(Production) Engineering
20	Wood and Paper Technology	
21	Plastic Moulding Technology from CIPET	
22	Manufacturing technology	
23	Printing Technology	Printing Technology (In the Absence of Printing Technology, other branches will be considered)
24	Mechanical Engineering	Automobile Engineering/ Mechanical Engineering/ Industrial Engineering/ Production Engineering/ Mechanical (Production)/ Mechanical (Automobile)/ Mechatronix/ Aeronautical Engineering
25	Mechatronix Engineering	Electronics and communication Engineering/ Mechanical Engineering/ Mechatronix
26	Petrochemical Engineering	Chemical Engineering/ Biotechnology/ Biotechnology and Bio chemical Engineering
27	Electronics & Robotics Engineering	Electronics and Communication Engineering/ Computer Science & Engineering
28	Aeronautical Engineering	Mechanical Engineering/ Aeronautical Engineering

*The equivalent diploma courses on each subject can be referred from AICTE approval process of Hand book.

REVISED TIME SCHEDULE FOR LATERAL ENTRY B.TECH ADMISSION-21

Activity	
Online Registration	27.09.2021 to 09.10.2021
Downloading of Hall Tickets from the website	21.10.2021,22.10.2021
Date of Examination	23.10.2021
Publication of Result	02.11.2021
Downloading Score Cards from the website	03.11.2021
Online filling of options	03.11.2021 to06.11.2021(up to 5pm)
1st Allotment	10.11.2021
Admission (1st allotment)	11.11.2021,12.11.2021
Rearranging higher options	15.11.2021,16.11.2021 (up to 5pm)
2nd Allotment	18.11.2021
Admission (2nd allotment)	19.11.2021,20.11.2021
Centralized spot admission by DTE	27.11.2021

ANNEXURE D
CRITERIA FOR RANK LIST PREPARATION

1) LET Admission will be based on a rank list prepared based on an entrance test
2) The Entrance Test have two parts ie, part A for Diploma students and D Voc stream candidates and Part B for B.Sc stream students.
3) **Part A of the Entrance Test for Diploma and D.Voc stream candidates is for 120 marks and will be on following selected subjects of First year B.Tech course and English language.**

i.	Basic civil &Mechanical Engg	- 30 marks (Annexure-K(i))
ii.	Basic of Electrical and Electronics Engg	- 30 marks (Annexure-K(ii))
iii.	Programming in C	- 15 marks (Annexure-K(iii))
iv.	Engineering Mechanics	-15 marks (Annexure-K(iv))
v.	Mathematics	-20 marks (Annexure-K(v))
vi.	English	-10 marks (Annexure-K(vi))

Part B of the Entrance Test for B.Sc stream candidates is for 120 marks and will be on following selected subjects of first year B.Tech course and English language.

i.	Mathematics	-40 marks (Annexure-K(vii))
ii.	Physics	-30 marks (Annexure-K(viii))
iii.	Chemistry	-20 marks (Annexure-K(ix))
iv.	Programming in C	-15 marks (Annexure-K(x))
v.	English	-15 marks (Annexure-K(xi))

4) The detailed syllabus of the above selected subjects is shown in Annexure K
5) 1 mark for each correct answer. No negative marking.
6) Marking for more than one bubble against a question will be considered as wrong answer.
7) Erasing, overwriting, partial marking etc may also be treated as wrong answer.
8) No mark for unanswered questions.
9) If the candidate does not answer any single question, his candidature will be cancelled.

10) Resolution of tie for preparing the rank list for the Diploma/D.Voc stream

a) If there is any tie exists for same rank, candidates with higher score in Mathematics will be placed in higher rank.
b) If tie still exists, candidates with higher score in English will be placed in higher rank.
c) If the tie further exists, age of the candidate will be taken into account and the older will be placed in higher rank than the younger one.

11) Resolution of tie for preparing the rank list for B.Sc stream

a. If there is any tie exists for same rank, candidates with higher score in Mathematics will be placed in higher rank.
b. If tie still exists, candidates with higher score in Physics will be placed in higher rank.
c. If the tie further exists, age of the candidate will be taken into account and the older will be placed in higher rank than the younger one.

ANNEXURE - E

LIST OF SCHEDULED CASTES (SC)

[As Amended by The Constitution (Scheduled Castes) Orders (Second Amendment) Act, 2002 (Act 61 of 2002) Vide Part VIII – Kerala - Schedule 1 Notified in the Gazette of India dated 18.12.2002, The Constitution (Scheduled Castes) Order (Amendment) Act 2007, The Constitution (Scheduled Castes) Order (Amendment) Act 2016, No. 24 of 2016]

[See Clause 5.4.3 (a)]

1 Adi Andhra
2 Adi Dravida
3 Adi Karnataka
4 Ajila
5 Arunthathiyar
6 Ayyanavar
7 Baira
8 Bakuda
9 xxx
10 Bathada
11 xxx
12 Bharathar (Other than Parathar), Paravan
13 xxx
14 Chakkiliyan
15 Chamar, Muchi
16 Chandala
17 Cheruman
18 Domban
19 xxx
20 xxx
21 xxx
22 Gosangi
23 Hasla
24 Holeya
25 Kadaiyan
26 Kakkalan, Kakkan
27 Kalladi
28 Kanakkan, Padanna, Padannan
29 xxx
30 Kavara (other than Telugu speaking or Tamil speaking Balija Kavarai, Gavara, Gavarai, Gavarai Naidu, Balija Naidu, Gajalu Balija or Valai Chetty)
31 Koosa
32 Kootan, Koodan
33 Kudumban
34 Kuravan, Sidhanar, Kuravar, Kurava, Sidhana
35 Maila
36 Malayan [In the areas comprising the Kannur, Kasaragode, Kozhikode and Wayanad Districts].
37 Mannan (മണ്ണാൻ), Pathiyan, Perumannan, Peruvannan, Vannan, Velan
38 xxx
39 Moger (other than Mogeyar)
40 Mundala
41 Nalakeyava
42 Nalkadaya
43 Nayadi
44 xxx
45 Pallan
46 Palluvan, Pulluvan
47 Pambada
48 Panan
49 xxx
50 Paraiyan, Parayan, Sambavar, Sambavan, Sambava, Paraya, Paraiya, Parayar
51 xxx
52 xxx
53 xxx
54 Pulayan, Cheramar, Pulaya, Pulayar, Cherama, Cheraman, Wayanad Pulayan, Wayanadan Pulayan, Matha, Matha Pulayan
55 xxx
56 Puthirai Vannan
57 Raneyar
58 Samagara
59 Samban
60 Semman, Chemman, Chemmar
61 Thandan (excluding Ezhuvas and Thiyyas who are known as Thandan, in the erstwhile Cochin and Malabar areas) and (Carpenters who are known as Thachan, in the erstwhile Cochin and Travancore State) Thachar (Other than carpenters)
62 Thoti
63 Vallon
64 Valluvan
65 xxx
66 xxx
67 Vetan
68 Vettuvan, Pulaya Vettuvan (in the areas of erstwhile Cochin State only).
69 Nerian

ANNEXURE – F

LIST OF SCHEDULED TRIBES (ST)

[As Amended by The Scheduled Castes and Scheduled Tribes Orders (Amendment) Act, 2002 (Act 10 of 2003) Vide Part - VII - Kerala - Second Schedule Notified in the Gazette of India dated 8.1.2003, G.O. (Ms) No. 06/2014/SCSTDD dated 29.01.2014]

[See Clause 5.4.3 (a)]

1 Adiyan
2 Arandan [Arandanan]
3 Eravallan
4 Hill Pulaya, Mala Pulayan, Kurumba Pulayan, Kuravazhi Pulayan, Pamba Pulayan
5 Irular, Irulan
6 Kadar [Wayanad Kadar]
7 xxx
8 Kanikkaran, Kanikkar
9 Kattunayakan
10 [Kochuvelan]
11 xxx
12 xxx
13 Koraga
14 xxx
15 Kudiya, Melakudi
16 Kurichchan [Kurichiyan]
17 Kurumans, Mullu Kuruman, Mulla Kuruman, Mala Kuruman
18 Kurumbas, [Kurumbar, Kurumban]
19 Maha Malasar
20 Malai Arayan [Mala Arayan]
21 Malai Pandaram
22 Malai Vedan [Malavedan]
23 Malakkuravan
24 Malasar
25 [Malayan, Nattu Malayan, Konga Malayan (excluding the areas comprising the Kasaragod, Kannur, Wayanad and Kozhikode Districts)
26 Malayarayar
27 Mannan (മന്നാൻ)
28 xxx
29 Muthuvan, Mudugar, Muduvan
30 Palleyan, Palliyan, Palliyar, Paliyan
31 xxx
32 xxx
33 Paniyan
34 Ulladan, [Ullatan]
35 Uraly
36 Mala Vettuvan(in Kasaragod & Kannur districts)
37 Ten Kurumban, Jenu Kurumban
38 Thachanadan, Thachanadan Moopan
39 Cholanaickan
40 Mavilan
41 Karimpalan
42 Vetta Kuruman
43 Mala Panikkar
44 Maratis of Kasargod and Hosdurg Taluk

ANNEXURE - G

LIST OF OTHER ELIGIBLE COMMUNITIES (OEC)

[GO (Ms) No.14/2017/BCDD dated: 02.08.2017, GO (Ms) No.7/2013/BCDD dated: 19.07.2013, See Clause 5.4.3 (f)]

OEC (ST)

1 Allar (Alan)
2 Chingathan
3 Irivavan
4 Kalanadi
5 Malayan, Konga-Malayan(Kasargod, Kannur, Wayanad and Kozhikode Districts)
6 Kundu-Vadiyan
7 Kunnuvarmannadi
8 Malamuthan
9 Malavettuvar (Except Kasargod and Kannur Districts)
10 Malayalar
11 Panimalayan
12 Pathiyan (other than Dhobies)
13 Hindu-Malayali

OEC (SC)

1 Chakkamar
2 Madiga
3 Chemman/Chemmar
4 Kudumbi
5 Dheevara/Dheevaran (Arayan, Valan, Nulayan, Mukkuvan, Arayavathi, Valanchiyar, Paniyakal, Mokaya, Bovi, Mogayar, Mogaveerar)
6 Scheduled Caste converted to Christianity
7 Kusavan, Kulalan, Kumbharan, Velaan, Velaar, Odan, Andhra Nair, Andhuru Nair,
8 Pulaya Vettuvan (Except Kochi State)

ANNEXURE – G(a)

LIST OF COMMUNITIES ELIGIBLE FOR EDUCATIONAL CONCESSIONS AS IS GIVEN TO OEC

[G.O.(Ms) No. 10/2014/BCDD dated: 23.05.2014] [See Clause 5.4.3 (h)]

1	Vaniya (Vanika, Vanika Vaisya, Vanibha Chetty, Vaniya Chetty, Ayiravar, Nagarathar and Vaniyan
2	Veluthedathu Nair (Veluthedan and Vannathan)
3	Chetty/Chetties (Kottar Chetties, Parakka Chetties, Elur Chetties, Attingal Chetties, Pudukkada Chetties, Iraniel Chetties, Sri Pandara Cetties, Telugu Chetties, Udiyankulangara Chetties, Peroorkada Chetties, Sadhu Chetties, 24 Mana Chetties, Wayanadan Chetties, Kalavara Chetties and 24 Mana Telugu Chetties
4	Ezhavathi (Vathy)
5	Ganika
6	Kanisu or Kaniyar Panicker, Kani or Kaniyan (Ganaka) or Kanisan or Kamnan, Kalari Kurup/Kalari Panicker
7	Vilkurup, Perumkollan
8	Yadavas (Kolaya, Ayar, Mayar, Maniyani and Iruman), Erumakkar
9	Devanga
10	Pattariyas
11	Saliyas (Chaliya, Chaliyan)
12	Pandithar
13	Vaniar
14	Ezhuthachan
15	Chakkala/Chakkala Nair
16	Reddiars (throughout the State except in Malabar Area)
17	Kavuthiya
18	Veerasaiva (Yogi, Yogeeswara, Poopandram, Malapandaram, Jangam, Matapathi, Pandaram, Pandaran, Vairavi, Vairagi)
19	Vilakkithala Nair – Vilakkithalavan
20	Vaduka – Vadukan, Vadugar, Vaduka, Vaduvan
21	Chavalakkaran
22	Agasa
23	Kaikolan
24	Kannadiyans
25	Kerala Mudalis
26	Madivala
27	Naikkans
28	Tholkolans
29	Thottian
30	Mooppar or Kallan Moopan or Kallan Moopar

ANNEXURE - H

LIST OF SOCIALLY AND EDUCATIONALLY BACKWARD CLASSES (SEBC)

[Vide G.O. (P) 208/66/Edn. dated 02.05.1966, G.O. (Ms) No. 95/08/SCSTDD dated 06.10.2008 & G.O. (Ms) No. 58/2012/SCSTDD dated 16.04.2012, G.O.(Ms) No. 10/2014/BCDD dated: 23.05.2014, Lr No. 1538/A2/2014/BCDD dated 02.07.2014, G.O.(Ms) No. 03/2018/BCDD dated 09.04.2018]

[See Clause 5.4.2 (a)]

I. **Ezhavas** including Ezhavas, Thiyyas, Ishuvan, Izhuvan, Illuvan and Billava

II. **Muslims** (all sections following Islam)

III. **Latin Catholics and Anglo Indians**

IV. **Dheevara** including Dheevaran, Araya,Arayas, Arayan, Valan, Nulayan, Mukkuvan, Arayavathi, Valinjiar, Paniakkal, Paniakel, Mukaya, Bovis-Mukayar, Mukaveeran, Mogaveera, Mogavirar,Mogayan

V. **Viswakarmas** including Viswakarma, Asari, Chaptegra, Kallassari, Kalthachan, Kammala, Kamsala, Kannan, Karuvan, Kitaran, Kollan, Malayala Kammala, Moosari, Pandikammala, Pandithattan, Perumkollan, Thachan, Thattan, Vilkurup, Villasan, Viswabrahmanan or Viswabrahmanar, Viswakarmala and Palisa Perumkollan

VI. **Kusavan** including Kulalan, Kulala Nair, Kumbaran, Velaan, Velaans, Velaar, Odan, Kulala, Andhra Nair, Anthuru Nair

VII. **Other Backward Christians**

(a) SIUC

(b) Converts from Scheduled Castes to Christianity

VIII. **Kudumbi**

IX. **Other Backward Hindus**, i.e.

1. Agasa
2. Kharvi
3. Aremahrati
4. Arya, Atagara, Devanga, Kaikolan, (Sengunthar) Pattarya, Pattariyas, Saliyas (Padmasali, Pattusali, Thogatta, Karanibhakatula, Senapathula, Sali, Sale, Karikalabhakulu, Chaliya, Chaliyan) Sourashtra, Khatri, Patnukaran, Illathu Pillai, Illa Vellalar, Illathar
5. Bestha
6. Bhandari or Bhondari
7. Boya
8. Boyan
9. Chavalakkaran
10. Chakkala (Chakkala Nair)
11. Devadiga
12. Ezhavathi (Vathi)
13. Ezhuthachan, Kadupattan
14. Gudigara
15. Galada Konkani
16. Ganjam Reddies
17. Gatti
18. Gowda
19. Ganika including Nagavamsom
20. Hegde
21. Hindu Nadar
22. Idiga including Settibalija
23. Jangam
24. Jogi
25. Jhetty
26. Kanisu or Kaniyar-Panicker, Kaniyan, Kanisan or Kamnan, Kannian or Kani, Ganaka
27. xxx
28. Kalarikurup or Kalari Panicker
29. Kerala Muthali, Kerala Mudalis
30. Oudan (Donga) Odda (Vodde or Vadde or Veddai)
31. Kalavanthula
32. Kallan including Isanattu Kallar
33. Kabera
34. Korachas
35. x x x
36. Kannadiyans
37. Kavuthiyan, Kavuthiya
38. Kavudiyaru
39. Kelasi or Kalasi Panicker
40. Koppala Velamas
41. Krishnanvaka
42. Kuruba
43. Kurumba
44. Maravan (Maravar)
45. Madivala
46. Maruthuvar
47. Mahratta (Non-Brahman)

48. Melakudi (Kudiyan)
49. x x x
50. Moili
51. Mukhari
52. Modibanda
53. Moovari
54. Moniagar
55. Naicken including Tholuva Naicker and Vettilakkara Naicker, Naikkans
56. Padyachi (Villayankuppam)
57. Palli
58. Panniyar or Pannayar
59. Parkavakulam (Surithiman, Malayaman, Nathaman, Moopanar and Nainar)
60. Rajapuri
61. Sakravar (Kavathi)
62. Senaithalaivar, Elavania, Senaikudayam
63. Chetty/Chetties including Kottar Chetties, Parakka Chetties, Elur Chetties, Attingal Chetties, Pudukkada Chetties, Iraniel Chetties, Sri Pandara Chetties, Telugu Chetties, Udiyankulangara Chetties, Peroorkada Chetties,Sadhu Chetties, 24 Mana Chetties, Wayanadan Chetties, Kalavara Chetties and 24 Mana Telugu Chetties
64. Tholkolan
65. Thottiyan, Thottian
66. Uppara (Sagara)
67. Ural Goundan
68. Valaiyan
69. Vada Balija
70. Vakkaliga
71. Vaduvan(Vadugan), Vaduka, Vadukan, Vadugar
72. Veera Saivas (Pandaram, Vairavi, Vairagi, Yogeeswar, Yogeeswara, Poopandaram, Malapandaram, Pandaran, Matapathi and Yogi)
73. Veluthedathu Nair including Vannathan, Veluthedan and Rajaka
74. Vilakkithala Nair including Vilakkathalavan, Ambattan Pranopakari, Pandithar and Nusuvan
75. Vaniya including Vanika, Vanika Vaisya, Vaisya Chetty, Vanibha Chetty, Ayiravar Nagarathar, Vaniyan, Vaniya Chetty, Vaniar
76. Yadava including Kolaya, Ayar, Mayar, Maniyani, Eruman, Iruman, Erumakkar, Golla and Kolaries
77. Chakkamar
78. Mogers of Kasaragod Taluk
79. x x x
80. x x x
81. x x x
82. Reddiars (throughout the State except in Malabar area)
83. Mooppar or Kallan Moopan or Kallan Moopar

ANNEXURE - I

CERTIFICATE FOR CLAIM OF SPECIAL RESERVATION UNDER QUOTA FOR CHILDREN OF SERVICING DEFENCE PERSONNEL (SD)/ PARA MILITARY FORCE PERSONNEL (RP)

Certified that Master/Kum……, an applicant for admission to the Lateral Entry B.Tech, Kerala, 2021, is the son/daughter* of Shri/Smt…….……

…….....(official address) who is serving defense/ paramilitary force* personnel presently working at …….

Place: **Signature of Commanding officer:**

Date:

Name :

(Office seal)

ANNEXURE J

CERTIFICATE FOR CLAIM OF SPECIAL RESERVATION UNDER QUOTA FOR CHILDREN OF EX-SERVICEMEN (XS)

Certified that Master/Kum……, an applicant for admission to the Lateral Entry B.Tech, Kerala 2021 is the son/ daughter* of Shri/Smt…….……. ……..(Official address) who is an ex-serviceman, and that no else in the family of the applicant has earlier enjoyed the special reservation benefit applicable to them, for admission to B.Tech (LET) in Kerala.

Place: Signature of Military Authority/State/Zilla Sainik Welfare Officer:

Date:

Name:

(Office seal)

ANNEXURE K
SYLLABUS FOR DIPLOMA AND D. VOC STUDENTS

BASICS OF CIVIL & MECHANICAL ENGINEERING (30 marks) (Annexure-K (i))

Module 1

General Introduction to Civil Engineering: Relevance of Civil Engineering in the overall infrastructural development of the country. Responsibility of an engineer in ensuring the safety of built environment. Brief introduction to major disciplines of Civil Engineering like Transportation Engineering, Structural Engineering, Geo-technical Engineering, Water Resources Engineering and Environmental Engineering.

Introduction to buildings: Types of buildings, selection of site for buildings, components of a residential building and their functions.

Building rules and regulations: Relevance of NBC, KBR & CRZ norms (brief discussion only).

Building area: Plinth area, built up area, floor area, carpet area and floor area ratio for a building as per KBR.

Module 2

Surveying: Importance, objectives and principles.

Construction materials, Conventional construction materials: types, properties and uses of building materials: bricks, stones, cement, sand and timber

Cement concrete: Constituent materials, properties and types.

Steel: Steel sections and steel reinforcements, types and uses.

Modern construction materials:- Architectural glass, ceramics, Plastics, composite materials, thermal and acoustic insulating materials, decorative panels, waterproofing materials. Modern uses of gypsum, pre fabricated building components (brief discussion only).

Module 3

Building Construction: Foundations: Bearing capacity of soil (definition only), functions of foundations, types – shallow and deep (brief discussion only). Load bearing and framed structures (concept only).

Brick masonry: - Header and stretcher bond, English bond & Flemish bond random rubble masonry.

Roofs and floors: - Functions, types; flooring materials (brief discussion only).

Basic infrastructure services: MEP, HVAC, elevators, escalators and ramps (Civil Engineering aspects only), fire safety for buildings.

Green buildings:- Materials, energy systems, water management and environment for green buildings. (brief discussion only).

Module 4

Analysis of thermodynamic cycles: Carnot, Otto, Diesel cycles, Derivation of efficiency of these cycles, Problems to calculate heat added, heat rejected, net work and efficiency. IC Engines: CI, SI, 2-Stroke, 4-Stroke engines. Listing the parts of different types of IC Engines. Efficiencies of IC Engines(Definitions only), Air, Fuel, cooling and lubricating systems in SI and CI Engines, CRDI, MPFI. Concept of hybrid engines.

Module 5

Refrigeration: Unit of refrigeration, reversed Carnot cycle,COP, vapour compression cycle (only description and no problems); Definitions of dry, wet & dew point temperatures, specific humidity and relative humidity, Cooling and dehumidification, Layout of unit and central air conditioners.

Description about working with sketches of: Reciprocating pump, Centrifugal pump, Pelton turbine, Francis turbine and Kaplan turbine. Overall efficiency, Problems on calculation of input and output power of pumps and turbines (No velocity triangles)

Description about working with sketches of: Belt and Chain drives, Gear and Gear trains, Single plate clutches.

Module 6

Manufacturing Process: Basic description of the manufacturing processes – Sand Casting, Forging, Rolling, Extrusion and their applications.

Metal Joining Processes: List types of welding, Description with sketches of Arc Welding, Soldering and Brazing and their applications

Basic Machining operations: Turning, Drilling, Milling and Grinding.

Description about working with block diagram of: Lathe, Drilling machine, Milling machine, CNC Machine. Principle of CAD/CAM, Rapid and Additive manufacturing.

BASICS OF ELECTRICAL AND ELECTRONICS ENGINEERING (30marks) (Annexure-K(ii))

Module 1

Elementary Concepts of Electric Circuits

Elementary concepts of DC electric circuits: Basic Terminology including voltage, current, power, resistance, emf; Resistances in series and parallel; Current and Voltage Division Rules; Capacitors &
Inductors: V-I relations and energy stored. Ohms Law and Kirchhoff's laws-Problems; Star-delta conversion (resistive networks only-derivation not required)-problems.

Analysis of DC electric circuits: Mesh current method - Matrix representation - Solution of network equations. Node voltage methods-matrix representation-solution of network equations by matrix methods. Numerical problems.

Module 2

Elementary Concepts of Magnetic circuits, Electromagnetic Induction and AC fundamentals

Magnetic Circuits: Basic Terminology: MMF, field strength, flux density, reluctance - comparison between electric and magnetic circuits- Series and parallel magnetic circuits with composite materials,numerical problems.

Electromagnetic Induction: Faraday's laws, problems, Lenz's law- statically induced and dynamically induced emfs - Self-inductance and mutual inductance, coefficient of coupling

Alternating Current fundamentals: Generation of alternating voltages-Representation of sinusoidal
waveforms: frequency, period, Average, RMS values and form factor of waveforms-Numerical Problems.

Module 3

AC Circuits: Phasor representation of sinusoidal quantities. Trignometric, Rectangular, Polar and complex forms.

Analysis of simple AC circuits: Purely resistive, inductive & capacitive circuits; Inductive and capacitive reactance, concept of impedance. Average Power Power factor. Analysis of RL, RC and RLC series circuits-active, reactive and apparent power. Simple numerical problems.

Three phase AC systems: Generation of three phase voltages; advantages of three phase systems, star and delta connections (balanced only), relation between line and phase voltages, line and phase currents- Numerical problems

Module 4

Introduction to Semiconductor devices: Evolution of electronics – Vacuum tubes to nano electronics. **Resistors, Capacitors and Inductors (constructional features not required):** types, specifications. Standard values, color coding. **PN Junction diode:** Principle of operation, V-I characteristics, principle of avalanche breakdown. **Bipolar Junction Transistors**: PNP and NPN structures, Principle of operation, relation between current gains in CE, CB and CC, input and output characteristics of common emitter configuration.

Module 5

Basic electronic circuits and instrumentation: Rectifiers and power supplies: Block diagram description of a dc power supply, Working of a full wave bridge rectifier, capacitor filter (no analysis), working of simple zener voltage regulator. **Amplifiers**: Block diagram of Public Address system, Circuit diagram and working of common emitter (RC coupled) amplifier with its frequency response, Concept of voltage divider biasing. **Electronic Instrumentation**: Block diagram of an electronic instrumentation system.

Module 6

Introduction to Communication Systems: Evolution of communication systems – Telegraphy to 5G.

Radio communication: principle of AM & FM, frequency bands used for various communication systems, block diagram of super heterodyne receiver, Principle of antenna – radiation from accelerated charge. **Mobile communication**: basic principles of cellular communications, principle and block diagram of GSM.

PROGRAMING IN C (15 marks) (Annexure-K(iii))

Module 1
Basics of Computer Hardware and Software
Basics of Computer Architecture: processor, Memory, Input& Output devices
Application Software & System software: Compilers, interpreters, High level and low level languages Introduction to structured approach to programming, Flow chart Algorithms, Pseudo code (bubble sort, linear search - algorithms and pseudocode)

Module 2
Program Basics
Basic structure of C program: Character set, Tokens, Identifiers in C, Variables and Data Types ,Constants, Console IO Operations, printf and scanf
Operators and Expressions: Expressions and Arithmetic Operators, Relational and Logical Operators, Conditional operator, size of operator, Assignment operators and Bitwise Operators. Operators
Precedence
Control Flow Statements: If Statement, Switch Statement, Unconditional Branching using goto statement, While Loop, Do While Loop, For Loop, Break and Continue statements.(Simple programs covering control flow)

Module 3
Arrays and strings
Arrays Declaration and Initialization, 1-Dimensional Array, 2-Dimensional Array
String processing: In built String handling functions (strlen, strcpy, strcat and strcmp, puts, gets) Linear search program, bubble sort program, simple programs covering arrays and strings

Module 4
Working with functions
Introduction to modular programming, writing functions, formal parameters, actual parameters Pass by Value, Recursion, Arrays as Function Parameters structure, union, Storage Classes, Scope and life time of variables, simple programs using functions

Module 5
Pointers and Files
Basics of Pointer: declaring pointers, accessing data though pointers, NULL pointer, array access using pointers, pass by reference effect
File Operations: open, close, read, write, append .
Sequential access and random access to files: In built file handling functions (rewind(), fseek(), ftell(), feof(), fread(), fwrite()), simple programs covering pointers and files.

ENGINEERING MECHANICS (15 marks) (Annexure-K (iv))

Module 1

Introduction to Engineering Mechanics-statics-basic principles of statics-Parallelogram law, equilibrium law, principles of superposition and transmissibility, law of action and reaction(review) free body diagrams. Concurrent coplanar forces-composition and resolution of forces-resultant and equilibrium equations – methods of projections – methods of moments – Varignon's Theorem of moments.

Module 2

Friction – sliding friction - Coulomb's laws of friction – analysis of single bodies –wedges, ladder- analysis of connected bodies .

Parallel coplanar forces – couple - resultant of parallel forces – centre of parallel forces – equilibrium of parallel forces – Simple beam subject to concentrated vertical loads. General coplanar force system - resultant and equilibrium equations.

Module 3

Centroid of composite areas- – moment of inertia-parallel axis and perpendicular axis theorems. Polar moment of inertia, radius of gyration, mass moment of inertia-ring, cylinder and disc. Theorem of Pappus Guldinus (demonstration only)

Forces in space - vectorial representation of forces, moments and couples –resultant and equilibrium equations – concurrent forces in space (simple problems only)

Module 4

Dynamics – rectilinear translation - equations of kinematics(review)

kinetics – equation of motion – D'Alembert's principle. – motion on horizontal and inclined surfaces, motion of connected bodies. Impulse momentum equation and work energy equation (concepts only).

Curvilinear translation - equations of kinematics –projectile motion(review), kinetics – equation of motion. **Moment of momentum and work energy equation** (concepts only).

Module 5

Rotation – kinematics of rotation- equation of motion for a rigid body rotating about a fixed axis – rotation under a constant moment.

Plane motion of rigid body – instantaneous centre of rotation (concept only).

Simple harmonic motion – free vibration –degree of freedom- undamped free vibration of spring mass system-effect of damping(concept only)

MATHEMATICS (20 marks) (Annexure-K(v))

Module 1

Linear algebra

Systems of linear equations, Solution by Gauss elimination, row echelon form and rank of a matrix, fundamental theorem for linear systems (homogeneous and non-homogeneous, without proof), Eigen values and eigen vectors. Diagonalization of matrices, orthogonal transformation, quadratic forms and their canonical forms.

Module 2

Multivariable calculus-Differentiation and Integration

Concept of limit and continuity of functions of two variables, partial derivatives, chain rule, total derivative, Relative maxima and minima, Absolute maxima and minima on closed and bounded set.

Double integrals (Cartesian),reversing the order of integration, Change of coordinates (Cartesian to polar).

Module 3

Sequences and series

Convergence of sequences and series, convergence of geometric series and p-series(without proof), test of convergence (comparison, ratio and root tests without proof).

Taylor series (without proof, assuming the possibility of power series expansion in appropriate domains), Binomial series and series representation of exponential, trigonometric, logarithmic functions (without proofs of convergence); Fourier series, Euler formulas, Convergence of Fourier series (without proof).

Module 4

Calculus of vector functions

Vector valued function of single variable, derivative of vector function and geometrical interpretation, motion along a curve-velocity, speed and acceleration. Concept of scalar and vector fields , Gradient and its properties, directional derivative , divergence and curl.

Module- 5

Ordinary differential equations, Laplace Transforms and Fourier Transforms

Homogenous linear differential equation of second order, superposition principle, general solution, homogenous linear ODEs with constant coefficients-general solution. Solution of Euler-Cauchy equations (second order only). Existence and uniqueness (without proof).

Laplace Transform and its inverse, linearity, Laplace transform of basic functions, Laplace transform of derivatives and integrals, solution of differential equations using Laplace transform, Unit step function.

Fourier integral representation, Fourier sine and cosine integrals. Fourier sine and cosine transforms, inverse sine and cosine transform.

Fourier transform and inverse Fourier transform, basic properties.

ENGLISH V (10 marks) (Annexure-K(vi))

For English, out of 10 marks to be awarded, 5 marks will be for questions based on a given passage and remaining 5 marks for basic Grammar and General English of plus 2 standards.

SYLLABUS FOR B.SC STUDENTS

MATHEMATICS(40 marks) (Annexure-K(vii))

Module 1
Linear algebra
Systems of linear equations, Solution by Gauss elimination, row echelon form and rank of a matrix, fundamental theorem for linear systems (homogeneous and non-homogeneous, without proof), Eigen values and eigen vectors. Diagonaliztion of matrices, orthogonal transformation, quadratic forms and their canonical forms.

Module 2
Multivariable calculus-Differentiation and Integration
Concept of limit and continuity of functions of two variables, partial derivatives, chain rule, total derivative, Relative maxima and minima, Absolute maxima and minima on closed and bounded set.
Double integrals (Cartesian),reversing the order of integration, Change of coordinates (Cartesian to polar).

Module 3
Sequences and series
Convergence of sequences and series, convergence of geometric series and p-series(without proof), test of convergence (comparison, ratio and root tests without proof).
Taylor series (without proof, assuming the possibility of power series expansion in appropriate domains), Binomial series and series representation of exponential, trigonometric, logarithmic functions (without proofs of convergence); Fourier series, Euler formulas, Convergence of Fourier series (without proof).

Module 4
Calculus of vector functions
Vector valued function of single variable, derivative of vector function and geometrical interpretation, motion along a curve-velocity, speed and acceleration. Concept of scalar and vector fields , Gradient and its properties, directional derivative , divergence and curl.

Module- 5
Ordinary differential equations, Laplace Transforms and Fourier Transforms
Homogenous linear differential equation of second order, superposition principle, general solution, homogenous linear ODEs with constant coefficients-general solution. Solution of Euler-Cauchy equations (second order only). Existence and uniqueness (without proof).
Laplace Transform and its inverse, linearity, Laplace transform of basic functions, Laplace transform of derivatives and integrals, solution of differential equations using Laplace transform, Unit step function.
Fourier integral representation, Fourier sine and cosine integrals. Fourier sine and cosine transforms, inverse sine and cosine transform. Fourier transform and inverse Fourier transform, basic properties.

ENGINEERING PHYSICS (30 marks) (Annexure-K(viii))

Module 1

Engineering Mechanics and Friction

Introduction to Engineering Mechanics-statics-basic principles of statics-Parallelogram law, equilibrium law, principles of superposition and transmissibility, law of action and reaction(review) free body diagrams.

Concurrent coplanar forces-composition and resolution of forces-resultant and equilibrium equations –methods of projections – methods of moments .

Friction – sliding friction - Coulomb's laws of friction – analysis of single bodies –wedges, ladder- analysis of connected bodies .

Module 2

Dynamics – rectilinear translation - equations of kinematics (review) kinetics – equation of motion – D'Alembert's principle. – motion on horizontal and inclined surfaces, motion of connected bodies. Impulse momentum equation and work energy equation (concepts only).

Rotation – kinematics of rotation- equation of motion for a rigid body rotating about a fixed axis – rotation under a constant moment. Plane motion of rigid body – instantaneous centre of rotation (concept only).

Simple harmonic motion – free vibration –degree of freedom- undamped free vibration of spring mass system-effect of damping(concept only)

Module3

Oscillations, Waves and Wave Optics

Harmonic oscillations, Damped harmonic motion- Over damped, Critically damped and Under damped Cases, Quality factor-Expression, Forced oscillations, Amplitude Resonance-Expression for Resonant frequency, Quality factor and Sharpness of Resonance, Wave motion- Derivation of one dimensional wave equation and its solution.

Interference of light-Principle of superposition of waves, Theory of thin films - Cosine law (Reflected system), Derivation of the conditions of constructive and destructive Interference, - Measurement of wavelength and refractive index, Diffraction of light, Fresnel and Fraunhofer classes of diffraction.

Module 4

Quantum Mechanics & Nanotechnology

Introduction for the need of Quantum mechanics, Wave nature of Particles, Uncertainty principle,Applications-Absence of electrons inside a nucleus and Natural line broadening Mechanism. Introduction to nanoscience and technology, Increase in surface to volume ratio for nanomaterials, Quantum confinement in one dimension, Properties of nanomaterials-mechanical, electrical and optical, Applications of nanotechnology (qualitative ideas)

Acoustics & Ultrasonics

Acoustics, Classification of sound-Musical sound-Noise, Characteristics of Musical Sounds-Pitch orfrequency-Loudness or Intensity-Measurement of Intensity level-Decibel-Quality or timbre, Absorption coefficient, Reverberation-Reverberation time-Significance- Factors affecting architectural acoustics and their remedies, Magnetostriction effect and Piezoelectric effect, Magnetostriction oscillator and piezoelectric oscillator –Working, Detection of ultrasonic waves.

Module 5

Laser and Fibre optics

Properties of laser, Absorption and emission of radiation, Spontaneous and stimulated emission, Construction and working of Ruby laser and Helium neon laser .Applications of laser, Holography, Difference between hologram and photograph, Applications Optic fibre-Principle of propagation of light, Types of fibres-Step index and Graded index fibres, Numerical aperture.

ENGINEERING CHEMISTRY (20 marks) (Annexure-K(ix))

Module 1

Electrochemistry and Corrosion

Introduction - Differences between electrolytic and electrochemical cells - Daniel cell - redox reactions - cell representation. Different types of electrodes (brief) - Reference electrodes - SHE - Calomel electrode - Glass Electrode - Construction and Working. Single electrode potential - definition - Helmholtz electrical double layer -Determination of E0 using calomel electrode. Determination of pH using glass electrode. Electrochemical series and its applications. Free energy and EMF - Nernst Equation - Derivation - single electrode and cell (Numericals) -Application - Variation of emf with temperature. Potentiometric titration - Introduction -Redox titration only. Lithiumion cell - construction and working. Conductivity- Measurement of conductivity of a solution (Numericals).

Corrosion-Electrochemical corrosion – mechanism. Galvanic series- cathodic protection - electroless plating –Copper and Nickel plating.

Module 2

Spectroscopic Techniques and Applications

Introduction- Types of spectrum - electromagnetic spectrum - molecular energy levels - Beer Lambert's law (Numericals). UV-Visible Spectroscopy – Principle - Types of electronic transitions - Energy level diagram of ethane, butadiene, benzene and hexatriene. Instrumentation of UV-Visible spectrometer and applications.IR-Spectroscopy – Principle - Number of vibrational modes - Vibrational energy states of a diatomic molecule and -Determination of force constant of diatomic molecule (Numericals) –Applications. 1H NMR spectroscopy – Principle - Relation between field strength and frequency - chemical shift - spin-spin splitting (spectral problems) - coupling constant (definition) - applications of NMR- including MRI (brief).

Module 3

Instrumental Methods and Nanomaterials

Thermal analysis –TGA- Principle, instrumentation (block diagram) and applications – TGA of $CaC_2O_4.H_2O$ and polymers. DTA-Principle, instrumentation (block diagram) and applications - DTA of $CaC_2O_4.H_2O$. Chromatographic methods - Basic principles and applications of column and TLCRetention factor. GC and HPLC-Principle, instrumentation (block diagram) - retention time and applications.

Nanomaterials - Definition - Classification - Chemical methods of preparation - Hydrolysis and Reduction - Applications of nanomaterials - Surface characterisation -SEM – Principle and instrumentation (block diagram).

Module 4

Stereochemistry and Polymer Chemistry

Isomerism-Structural, chain, position, functional, tautomerism and matamerism - Definition with examples - Representation of 3D structures-Newman, Sawhorse, Wedge and Fischer projection of substituted methane and ethane. Stereoisomerism - Geometrical isomerism in double bonds and cycloalkanes (cis-trans and E-Z notations). R-S Notation – Rules and examples - Optical isomerism, Chirality, Enantiomers and Diastereoisomers-Definition with examples. Conformational analysis of ethane, butane, cyclohexane, mono and di methyl substituted cyclohexane.

Copolymers - Definition - Types - Random, Alternating, Block and Graft copolymers - ABS - preparation, properties and applications.Kevlar-preparation, properties and applications.Conducting polymers - Doping -Polyaniline and Polypyrrole - preparation properties and applications. OLED - Principle, construction and advantages.

Module 5

Water Chemistry and Sewage Water Treatment

Water characteristics - Hardness - Types of hardness- Temporary and Permanent - Disadvantages of hard water -Units of hardness- ppm and mg/L -Degree of hardness (Numericals) - Estimation of hardness-EDTA method (Numericals). Water softening methods-Ion exchange process-Principle, procedure and advantages. Reverse osmosis – principle, process and advantages. Municipal water treatment (brief) - Disinfection methods - chlorination, ozone andUV irradiation.

Dissolved oxygen (DO) -Estimation (only brief procedure-Winkler's method), BOD and COD definition, estimation (only brief procedure) and significance (Numericals). Sewage water treatment - Primary, Secondary and Tertiary - Flow diagram - Trickling filter and UASB process

PROGRAMING IN C (15 marks) (Annexure-K(x))

Module 1
Basics of Computer Hardware and Software
Basics of Computer Architecture: processor, Memory, Input& Output devices
Application Software & System software: Compilers, interpreters, High level and low level languages Introduction to structured approach to programming, Flow chart Algorithms, Pseudo code (bubble sort, linear search - algorithms and pseudocode)

Module 2
Program Basics
Basic structure of C program: Character set, Tokens, Identifiers in C, Variables and Data Types , Constants, Console IO Operations, printf and scanf
Operators and Expressions: Expressions and Arithmetic Operators, Relational and Logical Operators, Conditional operator, size of operator, Assignment operators and Bitwise Operators. Operators
Precedence
Control Flow Statements: If Statement, Switch Statement, Unconditional Branching using goto statement, While Loop, Do While Loop, For Loop, Break and Continue statements.(Simple programs covering control flow)

Module 3
Arrays and strings
Arrays Declaration and Initialization, 1-Dimensional Array, 2-Dimensional Array
String processing: In built String handling functions (strlen, strcpy, strcat and strcmp, puts, gets) Linear search program, bubble sort program, simple programs covering arrays and strings

Module 4
Working with functions
Introduction to modular programming, writing functions, formal parameters, actual parameters Pass by Value, Recursion, Arrays as Function Parameters structure, union, Storage Classes, Scope and life time of variables, simple programs using functions

Module 5
Pointers and Files
Basics of Pointer: declaring pointers, accessing data though pointers, NULL pointer, array access using pointers, pass by reference effect
File Operations: open, close, read, write, append.
Sequential access and random access to files: In built file handling functions (rewind(), fseek(), ftell(), feof(), fread(), fwrite()), simple programs covering pointers and files.

ENGLISH (15 marks) (Annexure-K(xi))

Total 15 questions for 15 marks based on the following topics

Vocabulary Building , The concept of Word Formation, Root words from foreign languages and their use in English, Acquaintance with prefixes and suffixes from foreign languages in English to form derivatives. Synonyms, antonyms, and standard abbreviations. Basic Writing Skills, Sentence Structures, Use of phrases and clauses in sentences, Importance of proper punctuation, Creating coherence, Organizing principles of paragraphs in documents, Techniques for writing precisely Identifying common errors in writing, Subject-verb agreement, Noun-pronoun agreement, Misplaced modifiers, Articles Prepositions, Redundancies, Clichés, Nature and Style of sensible writing, Describing , Defining, Classifying, Providing examples or evidence, Writing introduction and conclusion.

GUIDELINES FOR FILLING LET (B.Tech)-2021 APPLICATION FORM

1. Read the prospectus (available in the website: www.admissions.dtekerala.gov.in) with almost care before submitting the application through online**. The online registration closes on 30.09.2021 at 5 pm**

2. First complete the registration and obtain login id (application no) and password. Do not forget to take the copy of the registration details. For resetting the password, the date of birth, mobile no and email id given at the time of registration are compulsory.

3. The application forms shall be filled up strictly in accordance with the direction contained in the prospectus. No Colum shall leave blank.

4. Upload a passport size photo of the candidate in **jpg/jpeg** format of size between15 to 30 kb for online registration and **affix the same photograph duly attested by Gazetted Officer in the space provided in the hard copy of the application form.**

5. Candidates are requested to remit the required fee as per Para 8 of the prospectus after online registration.

6. No Editing or Modification is allowed after confirming the online submission of the application form.

7. Hard copy of the application form,SBI chalan & the Performa for certificates will be obtained only after completing the online submission.

8. Defective or incomplete application will be rejected. **Documents/Certificates furnished after the submission of the application will not be entertained under any circumstances.**

9. Candidates are also advised to keep a photocopy of the duly filled application Form and the application number furnished may be used as the identification code for future reference.

10. Fee once remitted will not be refunded.

11. The computer printout of the e-certificates (for community) issued by Village Officers & Tahasildar is also acceptable.

12. For more information and clarification on general doubts regarding LET(B.Tech)2021 admission, candidates can call at:**0471-2775431(10 am to 5 pm on all working days**).For clarification regarding allotments, the candidates can call at **0471-2561313,** (**10 am to 5 pm on all working days).**