Syllabus of I & II Semester B.E. / B.Tech

Common to all Engineering Branches

(With effect from 2006-07)

Visvesvaraya Technological University, Belgaum

ವಿಶ್ವೇಶ್ವರಯ್ಯ ತಾಂತ್ರಿಕ ವಿಶ್ವವಿದ್ಯಾಲಯ, ಬೆಳಗಾವಿ

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Regulations Governing B.E./B.Tech. and I Year Scheme & Syllabus

(Common to all Engineering Branches)

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Regulations Governing

THE DEGREE OF BACHELOR OF ENGINEERING / TECHNOLOGY

(with effect from 2006-2007)

OB 1 **TITLE AND DURATION OF THE COURSE**

OB 1.1 The course shall be called the degree course in Bachelor of Engineering / Technology, abbreviated as B.E. / B.Tech.

OB 1.2 The course shall be of 4 academic years duration and conducted in 8 semesters and each semester having duration of 16 weeks. For evening courses the contact hours are to be satisfied by working extra on afternoons of Saturday and Sunday.

OB 1.3 The calendar of events in respect of the course shall be fixed by the University from time to time.

OB 1.4 The examination in all the subjects shall be conducted at the end of each semester for all the 8 semesters.

OB 2 **ELIGIBILITY FOR ADMISSION(The Government orders issued from time to time in this regard shall prevail.)**

OB 2.1 Admission to I year, I semester Bachelor Degree in Engineering/ Technology shall be open for the candidates who have passed the second year Pre-University or XII standard or equivalent examination recognized by the University.

OB 2.2 In addition to OB 2.1, the candidate shall have secured not less than forty five percent (45%) marks in the aggregate with Physics and Mathematics as compulsory subjects, along with one of the following subjects:- Chemistry, Bio-Technology, Computer Science, Biology and Electronics. Provided that, the minimum marks for the purpose of eligibility shall be forty percent (40%) in optional subjects in case of candidates belonging to SC/ST and OBC. Provided that, the candidate shall have studied and passed English as one of the subjects.

OB 2.3 (a) Admission to II year, III semester Bachelor Degree in Engineering/ Technology (**Lateral Entry**) shall be open for the candidates

who are holders of a Diploma or equivalent examination, as recognized by University and has secured not less than forty percent (40%) marks, in the final year examination (fifth and sixth semesters) in respect of candidates belonging to SC/ST and OBC and in respect of others the candidate has secured not less than forty five percent (45%) marks in the appropriate branch of engineering specified in relevant Government Order issued from time to time.Such a candidate shall clear prescribed bridge courses as specified by the University.

OB 2.3 (b) For **Evening Course,** admission shall be open for a candidate

i) who is a holder of a Diploma or equivalent examination, as recognized by the University and has secured not less than forty percent (40%) marks, in the final year examination (fifth and sixth semesters) in respect of candidates belonging to SC/ST and OBC and in respect of others the candidate has secured not less than forty five percent (45%) marks in the appropriate branch of engineering specified in relevant Government Order issued from time to time and

ii) who, on the first day of the term notified by the University for the year of admission, has not less than one-year professional experience in the branch of engineering / technology, in which the candidate holds a diploma, after passing diploma course.

Explanation: Professional experience means employed on regular basisa

a) in Government, Government undertaking, Public Sector undertaking, Corporations or

b) in a private company registered under the Directorate of Industries and Commerce or the Directorate of Small Scale Industries or

c) in Government, Government recognized institutions as technical staff.

Provided that the period of apprenticeship undergone shall also be treated as professional experience, if sponsored by the Board of Apprenticeship Training, Southern Region, Chennai or by Government, Government undertaking and Public Sector

undertaking.Provided further that employment shall be in an establishment situated within the urban agglomeration of city in which the professional institution is situated.

OB 2.4 Those candidates who have passed a qualifying examination other than the PUC II examination of the Pre-University Education Board of Karnataka, or Engineering Diploma Examinations of the Board of Technical Education of Karnataka, have to obtain eligibility certificate for seeking admission to B.E./B.Tech. Degree course from Visvesvaraya Technological University, Belgaum, or from the Principal of concerned Engineering College of Karnataka State.

OB 3 ATTENDANCE REQUIREMENT

OB 3.1 Each semester is considered as a unit and the candidate has to put in a minimum attendance of 85% in each subject with a provision of condonation of 10% of the attendance by the Vice-Chancellor on the specific recommendation of the Principal for reasons such as medical grounds, participation in University level sports, cultural activities, seminars, workshops and paper presentation.

OB 3.2 The basis for the calculation of the attendance shall be the period prescribed by the University by its calendar of events. For the first semester students, the same is reckoned from the date of admission to the course as per CET allotment.

OB 3.3 The students shall be informed about their attendance position periodically by the Colleges so that the students shall be cautioned to make up the shortage. The Principals of the affiliated Colleges shall submit the list of students who have been detained for shortage of attendance by the end of the semester to the Registrar (Evaluation) with a copy to the Registrar.

OB 3.4 A Candidate having shortage of attendance in one or more subjects shall have to repeat the whole semester and such candidates shall not be permitted to take admission to next higher semester.

Such students shall take readmission to the same semester in the subsequent academic year.

OB 3.5 **Temporary Discontinuation of Course:**

A student, who wishes to temporarily discontinue the course and continue subsequently, has to obtain prior permission from the University by applying through the Principal. Such students have to take readmission to the same semester/year in the subsequent academic year. However, the candidate shall complete the course as per OB 6.2.

OB 4 **INTERNAL ASSESSMENT MARKS**

OB 4.1 Each subject of theory or practical shall have a maximum Internal Assessment Marks of 25. For seminars, the IA marks shall be 50.

OB 4.2 The Internal Assessment marks in a theory subject shall be based on two tests generally conducted at the end of 8 and 12 weeks of each semester. An additional test may be conducted for desirous students before the end of the semester to give an opportunity to such students to improve their Internal Assessment Marks. The test shall be answered in Blue Books with pages serially numbered. These blue books shall be kept in the custody of the Principal of the College till one month from the date of announcement of the result by the University. These shall be made available to University authorities for verification as per the directions of the Registrar (Evaluation)/ Registrar.

OB 4.3 Average of the better marks obtained from any two tests shall be the Internal Assessment Marks for the relevant subject.

OB 4.4 If a candidate remains absent for all the tests conducted, the Internal Assessment Marks shall be marked as A for the subject against the University Seat Number (USN) of the candidate in the marks sheet submitted to the University by the Principal of the College.

OB 4.5 In the case of Practicals, the IA marks shall be based on the laboratory journals/reports and one practical test.

OB 4.6 i) For I year Computer Aided Engineering Drawing:

a) 15 marks for class work (sketching and Computer Aided Engineering drawing).

b) 10 marks for test in the same pattern as that of the main examination (better of the two tests)

ii) The IA marks for other Drawings and Design Drawings offered by various branches shall be based on the evaluation of the sheets and one test in the ratio of 60:40.

OB 4.7 The IA marks in the case of Project and Seminar in the final year shall be based on the evaluation at the end of 8th semester by a committee consisting of the Head of the concerned Department and two senior faculty of the Department (one of them being the project / seminar guide).

OB 4.8 The final list, incorporating corrections (if any) of IA marks awarded to the students in the Theory / Practicals / Project work / Seminar, shall be displayed on the notice board of the College at least seven days before the closure of the semester and a certified copy of the same shall be sent by the Principals to the University Examination Section within the stipulated date. The IA marks sheets shall bear the signature of the concerned Teacher/ Teachers, Head of the Department and Principal.

OB 4.9 Any corrections or over writing of IA marks shall bear the signature of concerned Teacher(s) and in such cases the Head of the Department shall indicate the number of corrections and attest it with his signature.

OB4.10 (a) A candidate failing to secure a minimum of 50% of the IA marks (12/25) in Practicals, 50% of marks in Project Work, shall not be eligible for the corresponding subject(s) in the University examination.

OB4.10 (b) For Seminars, the minimum requirement of IA marks shall be 40% of the maximum.

OB 4.11 Such candidates as mentioned in OB 4.10, shall repeat the laboratory work/project work during the subsequent semester(s) and secure at least the minimum marks prescribed.

OB 4.12 For theory subjects, there shall not be any minimum requirements of IA marks.

OB 4.13 There shall be no provision for improvement of IA marks in theory subjects and in cases of Laboratory/Workshop/Seminar

where the candidate has already secured the minimum required marks.

OB 4.14 IA marks of those candidates to whom OB 4.11 applies, shall be sent separately to the Registrar (Evaluation).

OB 4.15 IA marks shall reach the University before the commencement of examination. After the submission of Internal Assessment marks to the University, any request for change of IA marks shall not be considered under any circumstances.

OB 5 ELIGIBILITY FOR PASSING

OB 5.1 (a) For a pass in a theory subject/drawing, the candidate shall secure a minimum of 35% of the maximum marks prescribed in the University examination provided he/she secures 40% of marks in the aggregate inclusive of the IA marks.

OB 5.1 (b) For a pass in a Practical/Project/Viva-voce examination, a candidate shall secure a minimum of 40% of the maximum marks prescribed for the University Examination in the relevant Practical/ Project/Viva-voce.

OB 5.1 (c) For a pass in Seminar, a candidate shall secure a minimum of 40% of the maximum marks prescribed.

OB 5.2 The candidates who do not satisfy the condition OB 5.1 shall be deemed to have failed in that subject and may reappear for the University examination in the subsequent examinations. However, the IA marks awarded to the candidate/s at first attempt in the concerned theory subject will be carried forward. In case of Practicals/Projects/Seminar revised marks will be taken as per regulations OB 4.10 (a & b) and OB 4.11.

OB 5.3 The candidate who passes a subject of a semester as per OB 5.1 is not allowed to appear for the same again, unless he/she opts for rejection of results as per OB 5.4, 5.5, 5.6, 5.7 & 5.8.

OB 5.4 If a candidate so desires, there shall be provision for rejection of total performance of a semester (including IA marks) or rejection of results of performance in University examination of a semester only. But rejection is permitted only once during the entire course of study.

OB 5.5 The candidate who desires to reject the performance as per OB 5.4 shall reject performance in all the subjects of the semester, irrespective of whether the candidate has passed or failed in any subject. However, the rejection of performance of 8th semester project results shall not be permitted

OB 5.6 A candidate, who desires to reject the total performance of the semester including Internal Assessment, has to take readmission for the relevant semester. Application for such readmission shall be sent to the Registrar, through the Principal of College within 30 days from the date of announcement of the results. Late submission of application shall not be accepted for any reasons. Readmission to First semester in such cases will not be considered as fresh admission i.e., the candidate will continue to have the same University Seat Number, which was allotted earlier.

OB 5.7 The candidate, who desires to reject only the results of University examination of a semester and does not desire readmission, will be permitted to re-appear for examinations of all the subjects of the semester in the subsequent examinations. However, the IA marks obtained by the candidate in the rejected semester shall be retained. Applications for such rejection shall be sent to the Registrar (Evaluation) through the Principal of the College within 30 days from the date of announcement of the results. Late submission of applications shall not be accepted for any reasons.If the rejection of the University examination results of the semester happens to be of an odd semester, the candidate can take admission to the immediate next even semester. However, if the rejection of the University result is of even semester, the candidate cannot take admission to the next odd semester.

OB 5.8 Such candidates who opt for rejection at final year are eligible for award of class and distinction at the B.E./B.Tech. degree level, but not eligible for award of ranks.

OB 5.9 A candidate shall be declared to have completed the course of B.E./B.Tech. degree, provided the candidate has undergone the stipulated course work in all eight semesters as per the regulations.

OB 6 **MAXIMUM DURATION FOR COURSE COMPLETION:**

OB 6.1 A candidate who has not obtained the eligibility for third semester after a period of three academic years from the date of first admission shall discontinue the course. However, the candidate is eligible for readmission for first year B.E./B.Tech. in respective College of the University and he/ she shall be allotted a University Seat Number (USN) without any change in the year of admission in the USN but the serial number of the candidate shall start with Seven hundred (7XX) series in the same branch.

OB 6.2 The candidate shall complete the course within a period of eight academic years from the date of first admission, failing which he/she has to discontinue the course.

OB 7 **PROMOTION AND ELIGIBILITY FOR THE EXAMINATIONS**

OB 7.1 There shall not be any restriction for promotion from odd semester to even semester, provided the candidate has fulfilled the attendance requirement.

OB 7.2 A candidate is eligible for promotion from even semester to odd semester (i.e. to next academic year) provided, the candidate has not failed in more than four heads of passing of the immediately preceding two semesters and has passed in all the subjects of all the still lower semester examinations. A Theory or Practical shall be treated as a head of passing, for example:a.
A candidate seeking eligibility to 3rd semester should not have failed in more than 4 heads of passing of first and second semesters taken together.b.
A candidate seeking eligibility to 5th semester should have passed in all the subjects of 1st and 2nd semesters and should not have failed in more than 4 heads of passing of third and fourth semesters taken together.c.
A candidate seeking eligibility to 7th semester should have passed in all the subjects up to 4th semester and should not have failed in more than 4 heads of passing of fifth and sixth semesters taken together.

OB 8 : ELECTIVES

OB 8.1 A candidate shall take one elective in 6th semester ('A' group), two electives in 7th semester ('B' and 'C' groups) and two electives in 8th semester ('D' and 'E' groups) choosing one from each group in 7th and 8th semester. Minimum of three electives are to be listed in each group.

OB 8.2 The minimum number of students to be registered for an Elective to be offered shall not be less than ten.

OB 8.3 A candidate shall opt for his/her choice of electives and register for the same at the beginning of each of 6th, 7th and 8th semesters. The candidate is permitted to opt for change of subject within 15 days from the date of commencement of the semester as per the calendar of the University.

OB 9 SEMINAR AND PROJECT

OB 9.1 Seminar topic shall be selected from the emerging technical areas only.

OB 9.2 Project work at 8th semester shall be completed batch wise, the batch shall consist a maximum of 4 candidates.

OB 9.3 Project Viva-Voce examination shall be conducted batch-wise.

OB 10 AWARD OF CLASS AT SEMESTER LEVEL

OB 10.1 For the award of First Class with Distinction, in a semester, the candidate shall have passed the semester examination in one or more attempts securing not less than 70% marks in aggregate in **first attempt.**

OB 10.2 For the award of First Class in a semester examination, the candidate shall have passed the semester examination in one or more attempts securing not less than 60% but less than 70% marks in aggregate in **first attempt**.

OB 10.3 A candidate who secures less than 60% of marks in aggregate in **first attempt** and passes in all the subjects in one or more attempts, shall be declared to have passed the semester examination in only Second Class

OB 11 **AWARD OF CLASS AT DEGREE LEVEL**

OB 11.1 The Bachelor Degree in Engineering/Technology shall be awarded to the candidates who have passed all the stipulated examinations from 1st to 8th semesters. However, declaration of the class of the degree shall be based on the performance of the candidate in **first attempt** from 5th to 8th semester examinations taken together.

OB 11.2 A candidate who has passed in all subjects of 1st to 8th semester securing not less than 70% marks in the first attempt of 5th to 8th semesters taken together shall be declared to be eligible for the award of the B.E. / B.Tech. degree in **First Class with Distinction.**

OB 11.3 A candidate who has passed in all subjects of 1st to 8th semester securing not less than 60% but less than 70% of marks in aggregate in the first attempt in 5th to 8th semester examinations taken together shall be declared to be eligible for the award of the B.E./ B.Tech. degree in **First Class.**

OB 11.4 A candidate who has passed in all subjects of 1st to 8th semester securing less than 60% in aggregate in the first attempt in 5th to 8th semesters shall be declared to be eligible for the award of the B.E. / B.Tech. degree in **Second Class.**

OB 11.5 The marks secured by the candidate in a semester examination after rejecting the results will also be taken as first attempt marks and will be considered for the award of class of the Semester/ Degree but not for award of rank.

OB 12 **AWARD OF PRIZES, MEDALS & RANKS**

OB 12.1 For the award of Prizes and Medals, the conditions stipulated by the Donor may be considered as per the statutes framed by the University for such awards.

OB 12.2 For award of ranks in a branch, a minimum of 10 candidates should have appeared in the 8th semester examination. The total number of ranks awarded shall be 10% of total number of candidates appeared in 8th semester or 10 whichever is less in that branch.

OB 12.3 For award of rank in a branch of Engineering / Technology, the aggregate marks secured by the candidate from 5th semester to 8th semester shall be considered. A candidate shall be eligible for a rank at the time of award of degree in each branch of Engineering / Technology, provided the candidatea.
has passed 1st to 8th semester in all the subjects in first attempt onlyb.
has not repeated/rejected any of the lower semesters.

OB 13 TRANSFER OF STUDENTS

OB 13.1 Transfer of students from one College to another College within Karnataka state is permitted only at the beginning of third, fifth, and seventh semesters, subject to availability of seats within the permitted intake in respective Colleges and subject to the prior approval of the University and the provisions of OB 7.2. In the case of candidates from Universities other than VTU they should have passed in all the subjects of 1st & 2nd semesters for admission to 3rd semester and all the subjects of 1st to 4th semesters for admission to 5th semester and all the subjects of 1st to 6th semesters for admission to 7th semester.

The candidates seeking admission from Universities other than VTU shall have

a) to apply for establishment of equivalence with prescribed fees as notified by VTU and

b) obtain No Objection for admission from the University before commencement term as notified by VTU

OB 13.2 Transfer of students within the College from one branch to another branch at 3rd semester is permitted as per the provisions of Government of Karnataka/ AICTE. The change of branch requires approval of the University.

OB 13.3 For transfer from College to College or within the College (change of branch) a fee shall be charged by the University for administrative purpose (for updating of the records) which will be notified from time to time.

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VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELGAUM
SCHEME OF TEACHING AND EXAMINATION
I SEMESTER B.E./B.TECH.

PHYSICS GROUP

Sl. No.	Subject Code	Subject	Teaching Department	Board	Theory /Lab/ Drawing (Hrs/ Week)	Examination Marks		
						Th./Pr.	I.A.	Total
1	06 MAT-11	Engineering Maths-I	Maths	Basic Sc.	4 (T)	100	25	125
2	06 PHY-12	Engineering Physics	Physics	Basic Sc.	4 (T)	100	25	125
3	06 CIV-13	Elements of Civil Engg. & Engineering Mechanics	Civil Engg.	Civil Engg.	4 (T)	100	25	125
4	06 EME-14	Elements of Mechanical Engg.	Mech. Engg.	Mech. Engg.	4 (T)	100	25	125
5	06 ELE-15	Basic Electrical Engg.	E & E	E & E	4 (T)	100	25	125
6	06 WSL-16	Workshop Practice	Mech., Auto, IP, IEM, Mfg. Engg.	Mech. Engg.	3 (L)	50	25	75
7	06 PHYL-17	Engg. Physics Lab	Physics	Basic Sc.	3 (L)	50	25	75
8	06 CIP-18	*Constitution of India & Professional Ethics	Any Department		2 (T)	50	25	75
9		*Language (Kan.)	Humanities		2 (T)	---	---	---
				Total	**30**	****600**	****175**	**775**

I SEMESTER B.E./B.TECH

CHEMISTRY GROUP

Sl. No.	Subject Code	Subject	Teaching Department	Board	Theory /Lab/ Drawing (Hrs/ Week)	Examination Marks		
						Th./Pr.	I.A.	Total
1	06 MAT-11	Engineering Maths-I	Maths	Basic Sc.	4 (T)	100	25	125
2	06 CHE-12	Engineering Chemistry	Chemistry	Basic Sc.	4 (T)	100	25	125
3	06 CCP-13	Computer Concepts & C Programming	Any Engineering Department	CSE	4 (T)	100	25	125
4	06CED 14	Computer Aided Engineering Drawing	Mech./IP/Auto/Mfg.Engg./ IEM	Mech. Engg.	6 (2T + 4L)	100	25	125
5	06 ELN-15	Basic Electronics	E & C / E & E / TC / IT	E & C	4 (T)	100	25	125
6	06 CPL-16	Computer Programming Lab	Any Engineering Department	CSE	3 (L)	50	25	75
7	06 CHEL-17	Engg. Chemistry Lab	Chemistry	Basic Sc.	3 (L)	50	25	75
8	06 CIV-18	*Environmental Studies	Civil / Environmental	Civil	2 (T)	50	25	75
9		Language (Eng.)	Humanities		2 (T)	---	---	---
				Total	**32**	****600**	****175**	**775**

II SEMESTER B.E./B.TECH.

PHYSICS GROUP

Sl. No.	Subject Code	Subject	Teaching Department	Board	Theory /Lab/ Drawing (Hrs/ Week)	Examination Marks		
						Th./Pr.	I.A.	Total
1	06 MAT-21	Engineering Maths-II	Maths	Basic Sc.	4 (T)	100	25	125
2	06 PHY-22	Engineering Physics	Physics	Basic Sc.	4 (T)	100	25	125
3	06 CIV-23	Elements of Civil Engg. & Engineering Mechanics	Civil Engg.	Civil Engg.	4 (T)	100	25	125
4	06 EME-24	Elements of Mechanical Engg.	Mech. Engg.	Mech. Engg.	4 (T)	100	25	125
5	06 ELE-25	Basic Electrical Engg.	E & E	E & E	4 (T)	100	25	125
6	06 WSL-26	Workshop Practice	Mech./IP/Auto/Mfg.Engg./ IEM	Mech. Engg.	3 (L)	50	25	75
7	06 PHYL-27	Engg. Physics Lab	Physics	Basic Sc.	3 (L)	50	25	75
8	06 CIP-28	*Constitution of India & Professional Ethics	Any Department	Civil	2 (T)	50	25	75
9		Language (Kan.)	Humanities		2 (T)	---	---	---
				Total	**30**	**600	**175	**775**

II SEMESTER B.E./B.TECH.

CHEMISTRY GROUP

Sl. No.	Subject Code	Subject	Teaching Department	Board	Theory /Lab/ Drawing (Hrs/ Week)	Examination Marks		
						Th./Pr.	I.A.	Total
1	06 MAT-21	Engineering Maths-II	Maths	Basic Sc.	4 (T)	100	25	125
2	06 CHE-22	Engineering Chemistry	Chemistry	Basic Sc.	4 (T)	100	25	125
3	06 CCP-23	Computer Concepts & C Programming	Any Engineering Department	CSE	4 (T)	100	25	125
4	06 CED-24	Computer Aided Engineering Drawing	Mech./IP/Auto/Mfg.Engg./ IEM	Mech. Engg.	6 (2T + 4L)	100	25	125
5	06 ELN-25	Basic Electronics	E & C/ E & E / TC / IT	E & C	4 (T)	100	25	125
6	06 CPL-26	Computer Programming Lab	Any Engineering Department	CSE	3 (3)	50	25	75
7	06 CHEL-27	Engg. Chemistry Lab	Chemistry	Basic Sc.	3 (3)	50	25	75
8	06 CIV-28	*Environmental Studies	Civil / Environmental	Civil	2 (T)	50	25	75
9		Language (Eng.)	Humanities		2 (T)	---	---	---
				Total	32	**600	**175	775

***CIP/Env.Engg. : Question Papers will be of Objective Type. Students have to pass the subject compulsorily, however marks will not be considered for awarding class / rank.**

****Excluding Environmental Studies / Constitution of India & Professional Ethics**
Language (Kan./Eng.) - Áudit Course

ENGINEERING MATHEMATICS – I

Sub Code	**: 06 MAT 11**	**IA Marks**	**: 25**
Hrs/ Week	**: 04**	**Exam Hours**	**: 03**
Total Hrs.	**: 52**	**Exam Marks**	**: 100**

PART – A

Unit-I

Differential Calculus:

Determination of nth derivative of standard functions. Leibnitz's theorem (without proof) and Problems. Polar curves and angle between Polar curves. Pedal equations of polar curves.

7 Hours

Unit-II

Partial Differentiation:

Partial Derivatives, Euler's Theorem. Total differentiation. Differentiation of Composite and implicit functions. Jacobians and their properties. Errors and approximations.

6 Hours

Unit-III

Integral Calculus:

Reduction formulae for the integration of $\sin^n x$, $\cos^n x$, $\tan^n x$, $\cot^n x$, $\sec^n x$, $\text{cosec}^n x$, and $\sin^m x \cos^n x$ and evaluation of these integrals with standard limits – Problems. Tracing of standard curves in Cartesian form, Parametric form and Polar form.

6 Hours

Unit-IV

Applications of Integral Calculus:

Derivative of arc length. Applications to find area and length of given curves. Volumes and surface areas of solids of revolution. Differentiation under integral sign (Integrals with constant limits)

6 Hours

PART – B

Unit-V

Differential Equations:

Solution of first order and first degree differential equations: variables separable, homogeneous, exact, linear and equations reducible to above types. Illustrative examples from Engineering Field. Orthogonal trajectories of Cartesian and polar curves.

8 Hours

Unit-VI

Infinite Series:

Convergence, divergence and oscillation of an infinite series, comparison test, p-series, D'Alembert's ratio test, Raabe's test, Cauchy's root test, Cauchy's integral test (all tests without proof) for series of positive terms. Alternating series, Absolute and Conditional convergence. Leibnitz's test (without proof) and Problems.

6 Hours

Unit-VII

Analytical Geometry in three dimensions:

Direction cosines and direction ratios. Planes, Straight lines, Angle between planes / straight lines, Coplanar lines. Shortest distance between two skew lines.

7 Hours

Unit-VIII

Vector Calculus:

Vector differentiation. Velocity, Acceleration of a particle moving on a space curve. Vector point function. Gradient, Divergence, Curl, Laplacian. Solenoidal and Irrotational vectors - Problems.

6 Hours

Text Book:

1. B. S. Grewal, "Higher Engg. Mathematics", 36th Edn, July 2001.

Chapter – 3:	3.13 to 3.17 and 3.21, 3.22
Chapter – 4:	4.1 to 4.3, 4.10, 4.11
Chapter – 5:	5.1, 5.2, 5.4, 5.5, 5.7, 5.8, 5.10, 5.11
Chapter – 6:	6.2 to 6.4 , 6.9 to 6.13 & 8.1 to 8.10
Chapter – 9:	9.3 to 9.7, 9.9, 9.10(1), 9.11 to 9.13
Chapter – 11:	11.6 to 11.11
Chapter – 12:	12.3, 12.4 (example 12.8), 12.5 (4)

Reference Books:

1. Advanced Engineering Mathematics by – E Kreyszing
   - John Wiley & Sons, 8th Edn.
2. A Short Course in Differential Equations – Rainville E.D., 4th Ed. 1969.

Note: 1) One Question is to be set from each Unit

2) To Answer Five questions choosing at least TWO questions from each Part.

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ENGINEERING PHYSICS

Sub Code	**: 06 PHY 12/06 PHY 22**	**IA Marks**	**: 25**
Hrs/ Week	**: 04**	**Exam Hours**	**: 03**
Total Hrs.	**: 52**	**Exam Marks**	**: 100**

PART – A

Unit-I

Modern Physics

Introduction to Blackbody radiation spectrum, Photo-electric effect, Compton effect. Wave particle Dualism. de Broglie hypothesis – de Broglie wavelength, extension to electron particle. – Davisson and Germer Experiment.

Matter waves and their Characteristic properties. Phase velocity, group velocity and Particle velocity. Relation between phase velocity and group velocity. Relation between group velocity and particle velocity. Expression for deBroglie wavelength using group velocity.

7 Hours

Unit-II

Quantum Mechanics

Heisenberg's uncertainty principle and its physical significance(no derivation). Application of uncertainty principle (Non-existence of electron in the nucleus). Wave function. Properties and Physical significance of a wave function. Probability density and Normalisation of wave function. Setting up of a one dimensional, time independent, Schrödinger wave equation. Eigen values and eigen function. Application of Schrödinger wave equation – Energy eigen values for a free particle. Energy eigen values of a particle in a potential well of infinite depth.

6 Hours

Unit-III

Electrical Conductivity in Metals

Free-electron concept. Classical free-electron theory - Assumptions. Drift velocity. Mean collision time and mean free path. Relaxation time. Expression for drift velocity. Expression for electrical conductivity in metals. Effect of impurity and temperature on electrical resistivity of metals. Failure of classical free-electron theory.

Quantum free-electron theory - Assumptions. Fermi - Dirac Statistics. Fermi-energy – Fermi factor. Density of states (with derivation). Expression for

electrical resistivity / conductivity. Temperature dependence of resistivity of metals. Merits of Quantum free – electron theory.

7 Hours

Unit-IV

Dielectric and Magnetic Properties of Materials

Dielectric constant and polarisation of dielectric materials. Types of polarisation. Equation for internal fields in liquids and solids (one dimensional). Classius – Mussoti equation. Ferro and Piezo – electricity (qualitative). Frequency dependence of dielectric constant. Important applications of dielectric materials.

Qualitative treatement of Langevin's and Weiss's equation for dia, para and ferro-magnetic materials. B-H graph in ferromagnetic materials. Soft and Hard magnetic materials. Applications.

7 Hours

PART – B

Unit - V

Lasers

Principle and production. Einstein's coefficients (expression for energy density). Requisites of a Laser system. Condition for Laser action. Principle, Construction and working of He-Ne and semiconductor Laser. Applications of Laser – Laser welding, cutting and drilling. Measurement of atmospheric pollutants. Holography – Principle of Recording and reconstruction of 3-D images. Selected applications of holography.

6 Hours

Unit-VI

Superconductivity and Optical Fibers

Temperature dependence of resistivity in superconducting materials. Effect of magnetic field (Meissner effect). Type I and Type II superconductors. Temperature dependence of critical field. BCS theory (qualitative). High temperature superconductors. Applications of superconductors– Superconducting magnets, Maglev vehicles and SQUIDS.

Propagation mechanism in optical fibers. Angle of acceptance. Numerical aperture. Types of optical fibers and modes of propagation. Attenuation. Applications – block diagram discussion of point to point communication.

7 Hours

Unit-VII

Crystal Structure

Space lattice, Bravais lattice - unit cell, primitive cell. Lattice parameters.

Crystal systems. Direction and planes in a crystal. Miller indices. Expression for inter-planar spacing.

Co-ordination number. Atomic packing factor. Bragg's Law. Determination of crystal structure by Bragg's x-ray spectrometer. Crystal structures of NaCl, and diamond.

6 Hours

Unit-VIII

Material Science

Nano-materials – Molecular Manufacturing. Nano-mechanical bearings. Fabrication technology. Scaling of classical mechanical systems – Basic assumptions. Mechanical scaling. Scaling of electromagnetic systems – Basic assumptions. Corrections. Magnitude and scaling – Steady state systems, Time dependent systems. Carbon nano-tubes

Ultrasonic non-destructive testing of materials. Measurement of velocity in solids and liquids. Determination of elastic constants in solids and liquids.

6 Hours

Text Books

	Title	Author/s / Editor	Publishers
1	**Solid State Physics** - Fifth Edition	S.O. Pillai	New Age International
2	**Engineering Physics**	Gauer & Guptha	Dhanpathrai and Sons, New Delhi

Reference Books

1	**Nanosystems- Molecular Machinery, Manufacturing and Computation**	K.Eric Drexler	John Wiely & Sons 2005 Ed.
2	**Fundamentals and Applications of Ultrasonic Waves**	J David N Cheeke and Cheeke N Cheeke	CRC Press
3	**A Text Book of Engineering Physics**	M.N.Avadhanulu and P.G. Kshirsagar	S.Chand & Company Ltd.

Note: 1) One Question is to be set from each Unit

2) Students have to answer Five questions, choosing at least Two questions from each part.

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ENGINEERING CHEMISTRY

Sub Code	**: 06 CHE 12/06 CHE 22**	**IA Marks**	**: 25**
Hrs/ Week	**: 04**	**Exam Hours**	**: 03**
Total Hrs.	**: 52**	**Exam Marks**	**: 100**

PART – A

Unit-I

Chemical Energy Sources

Introduction to energy; Fuels - definition, classification, importance of hydrocarbons as fuels; Calorific value-definition, Gross and Net calorific values (SI units). Determination of calorific value of a solid / liquid fuel using Bomb calorimeter. Petroleum cracking-fluidised catalytic cracking. Reformation of petrol. Knocking - mechanism, octane number, cetane number, prevention of knocking, anti-knocking agents, unleaded petrol; synthetic petrol – Bergius process and Fischer Tropsch process; power alcohol.

Solar Energy

Photovoltaic cells- Introduction, definition, importance, working of a PV cell; solar grade silicon, physical and chemical properties of silicon relevant to photovoltaics, production of solar grade (crystalline) silicon and doping of silicon.

7 Hours

Unit-II

Electrochemical Energy Systems

Electrode potential and cells

Single electrode potential - definition, origin, sign conventions. Derivation of Nernst equation. Standard electrode potential l-definition. Construction of Galvanic cell – classification - primary, secondary and concentration cells, EMF of a cell – definition, notation and conventions. Reference electrodes – calomel electrode, Ag / AgCl electrode. Measurement of single electrode potential. Numerical problems on electrode potential and EMF. Ion-selective electrode-glass electrode, determination of pH using glass electrode.

6 Hours

Unit-III

Conversion and Storage of Electrochemical Energy

Battery Technology - Batteries- Basic concepts, battery characteristics. Classification of batteries – primary, secondary and reserve batteries. Classical Batteries – Construction working and applications of Zn – air, Nickel-Metal hydride and Lithium-MnO_2 batteries

5 Hours

Fuel Cells - Introduction, types of fuel cells-Alkaline, Phosphoric acid and Molten carbonate fuel cells. Solid polymer electrolyte and solid oxide fuel cells. Construction and working of H_2-O_2 and Methanol-Oxygen fuel cell.

2 Hours

Unit-IV

Corrosion Science

Corrosion - definition, Chemical corrosion and Electro-chemical theory of corrosion, Types of corrosion, Differential metal corrosion, Differential aeration corrosion (pitting and water line corrosion), Stress corrosion. Factors affecting the rate of corrosion.

Corrosion Control : Inorganic coatings – Anodizing and Phosphating, Metal coatings –Galvanization and Tinning, Corrosion Inhibitors, Cathodic and Anodic protection.

6 Hours

PART – B

Unit-V

Metal Finishing - Technological importance of metal finishing. Significance of polarization, decomposition potential and over-voltage in electroplating processes. Electroplating – Process, Effect of plating variables on the nature of electrodeposit, surface preparation and electroplating of Cr and Au.

Electroless plating - Distinction between electroplating and electroless plating, advantages of electroless plating. Electroless plating of copper on PCB and Nickel.

6 Hours

Unit-VI

Liquid Crystals and Their Applications - Introduction, classification-Thermotropic and Lyotropic with examples. Types of mesophases- nematic, chiral nematic (cholesteric), smectic and columnar. Homologues series (PAA and MBBA); Applications of liquid crystals in display systems.

4 Hours

Instrumental Methods of Analysis - Theory, Instrumentation and Applications of Colorimetry, Potentiometry, Conductometry.

2 Hours

Unit-VII

High Polymers - Definition, Classification - Natural and synthetic with examples. Polymerization – definition, types of polymerization - Addition and Condensation with examples. Mechanism of polymerization - free radical mechanism (ethylene as an example), Methods of polymerization - bulk, solution, suspension and emulsion polymerization. Glass transition temperature, structure and property relationship. Compounding of resins. Synthesis, properties and applications of

Teflon. PMMA, Polyurethane and Phenol – formaldehyde resin. Elastomers - Deficiencies of natural rubber and advantages of synthetic rubber. Synthesis and application of Neoprene, Butyl rubber. Adhesives- Manufacture and applications of Epoxy resins. Conducting polymers - definition, mechanism of conduction in polyacetylene. Structure and applications of conducting Polyaniline.

7 Hours

Unit-VIII

Water Technology - Impurities in water, Water analysis - Determination of different constituents in water - Hardness, Alkalinity, Chloride, Fluoride, Nitrate, Sulphate and Dissolved Oxygen. Numerical problems on hardness and alkalinity. Biochemical Oxygen Demand and Chemical Oxygen Demand. Numerical problems on BOD and COD. Sewage treatment.

Potable water, purification of water - Flash evaporation, Electrodialysis and Reverse Osmosis. Hazardous chemicals with ill effects.

7 Hours

Text Books

1. Engineering Chemistry by M.M.Uppal, Khanna Publishers,Sixth Edition, 2001
2. A text Book of Engineering Chemistry- by Jain and Jain, Dhanapatrai Publications, New Delhi.

Reference Books

1. Principles of Physical Chemistry B.R.Puri, L.R.Sharma & M.S.Pathania, S.Nagin Chand & Co., 33rd Ed., 1992.
2. Text Book of Polymer Science by F.W.Billmeyer, John Wiley & Sons, 1994.
3. Liquid crystals and plastic crystals , Vol-I, edited by G.W.Gray and P.A.Winsor, Ellis Horwood series in Physical Chemistry, New York.(p.No. 106-142).
4. Corrosion Engineering – by M.G.Fontana, Mc Graw Hill Publications.
5. Environmental Chemistry by Stanley E. Manahan, 7th Edition, Lewis Publishers, 2000.

Note: 1) One Question is to be set from each Unit

2) Students have to answer Five questions, choosing at least Two questions from each part.

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ELEMENTS OF CIVIL ENGINEERING & ENGINEERING MECHANICS

Sub Code : 06 CIV 13/06 CIV 23 | **IA Marks : 25**
Hrs/ Week : 04 | **Exam Hours : 03**
Total Hrs. : 52 | **Exam Marks : 100**

PART - A

Unit-I

1. Introduction to Civil Engineering, Scope of different fields of Civil Engineering - Surveying, Building Materials, Construction Technology, Geotechnical Engineering, Structural Engineering, Hydraulics, Water Resources and Irrigation Engineering, Transportation Engineering, Environmental Engineering. .
   Infrastructure: Types of infrastructure, Role of Civil Engineer in the Infrastructural Development, Effect of the infrastructural facilities on socio-economic development of a country. **04 Hours**
2. Roads: Type of roads, Components and their functions. **02 Hours**
3. Bridges and Dams: Different types with simple sketches. **01 Hour**

Unit -II

4. Introduction to Engineering mechanics: Basic idealisations - Particle, Continuum, Rigid body and Point force; Newton's laws of motion, Definition of force, Introduction to SI units, Elements of a force, Classification of force and force systems; Principle of physical independence of forces, Principle of superposition of forces, Principle of transmissibility of forces; Moment of a force, couple, moment of a couple, characteristics of couple, Equivalent force - couple system; Resolution of forces, composition of forces; Numerical problems on moment of forces and couples, on equivalent force - couple system. **07 Hours**

Unit -III

5. Composition of forces - Definition of Resultant; Composition of coplanar - concurrent force system, Principle of resolved parts; Numerical problems on composition of coplanar concurrent force systems. **03 Hours**
6. Composition of coplanar - non-concurrent force system, Varignon's principle of moments; Numerical problems on composition of coplanar non-concurrent force systems. **05 Hours**

Unit -IV

7. Centroid of plane figures; Locating the centroid of triangle, semicircle, quadrant of a circle and sector of a circle using method of integration, Centroid of simple built up sections; Numerical problems. **06 Hours**

PART - B

Unit -V

8. Equilibrium of forces - Definition of Equilibriant; Conditions of static equilibrium for different force systems, Lami's theorem; Numerical problems on equilibrium of coplanar – concurrent force system.

06 Hours

Unit -VI

9. Types of supports, statically determinate beams, Numerical problems on equilibrium of coplanar – non – concurrent force system and support reactions for statically determinate beams. **06 Hours**

Unit -VII

10. Friction - Types of friction, Laws of static friction, Limiting friction, Angle of friction, angle of repose; Impending motion on horizontal and inclined planes; Wedge friction; Ladder friction; Numerical problems.

06 Hours

Unit -VIII

11. Moment of inertia of an area, polar moment of inertia, Radius of gyration, Perpendicular axis theorem and Parallel axis theorem; Moment of Inertia of rectangular, circular and triangular areas from method of integration; Moment of inertia of composite areas; Numerical problems.

06 Hours

Text Books:

1. Elements of Civil Engineering by Jagadeesh T.R. and Jayaram, Sapna Book House, Bangalore.
2. Elements of Civil Engineering (IV Edition) by S.S. Bhavikatti, Vikas Publishing House Pvt. Ltd., New Delhi.

Reference Books:

1. Mechanics for Engineers: Statics by Ferdinand P. Beer and E. Russel Johnston Jr., McGraw-Hill Book Company, New York.
2. Engineering Mechanics by K.L. Kumar, Tata McGraw-Hill Publishing Company, New Delhi.
3. Engineering Mechanics by Timoshenko and Young, McGraw-Hill Book Company, New Delhi.

Question paper pattern

Question paper shall consist of two parts namely Part-A and Part-B. Part-A should consists of four questions, one each from Units – I, II, III and IV. Part-B should consist of Four questions, one each from Units – V, VI, VII and VIII. Each question should carry 20 marks.

The students should answer five full questions selecting at least two questions from each part.

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COMPUTER CONCEPTS AND C PROGRAMMING

Sub Code	**: 06 CCP 13 / 06 CCP 23**	**IA Marks**	**: 25**
Hrs/ Week	**: 04**	**Exam Hours**	**: 03**
Total Hrs.	**: 52**	**Exam Marks**	**: 100**

PART – A

Unit-I

Introducing Computer Systems

The Computer defined, Computers for individual users, Computers for organizations, The parts of a computer system, The information processing cycle, Essential computer hardware.

Interacting with Computer

The Keyboard – The standard keyboard layout, How the computer accepts input from the keyboard, The Mouse, Variants of the mouse. Inputting data in other ways – Devices for the hand, Optical Input Devices, Audiovisual Input Devices. Video and sound – Monitors, Data projectors, Sound systems, Printing – Commonly used printers - Dot Matrix Printers, Ink Jet Printers, Laser Printers.

7 Hours

Unit-II

Processing Data

Transforming Data into Information: How computers represent data, How computers process data, Factors affecting processing speed, Microcomputer processors, Extending the processor's power to other devices.

Storing Data

Types of storage devices, Measuring and improving drive performance.

6 Hours

Unit-III

Using Operating Systems

Operating system basics – The purpose of operating system, Types of operating system, Providing a user interface, PC operating systems- DOS; Windows –NT workstation, 9X, 2000Professional, XP; Linux for the desktop.

Networks and the Internet

Networking basics - The uses of a network, Common types of networks, Network topologies and protocols, What is the Internet?, Internet's major services, Understanding the world wide web, Using E-mail.

7 Hours

Unit-IV

Algorithms and Flowcharts

Algorithms, Flowcharts, Divide and conquer strategy. Writing algorithms and drawing flowcharts for simple exercises – Swapping contents of 2 variables, Largest of given three numbers, Solving a given quadratic equation, Factorial of a given integer

Constants, Variables and Data types

Characters set, C tokens, Keywords and Identifiers, Constants, Variables, Data types, Declaration of variables.

Operators and Expressions

Arithmetic operators, Relational operators, Logical operators, Assignment operators, Increment and Decrement operators, Conditional operator, Bitwise operators, Special operators, Arithmetic expressions, Evaluation of expressions, Precedence of Arithmetic operators, Type conversions in expressions, Operator precedence and associativity.

6 Hours

PART – B

Unit-V

Managing Input and Output Operations

Reading a character, Writing a character, Formatted Input, Formatted Output

Decision making and Branching

Decision making with *if* statement, Simple *if* statement, The *if...else* statement, Nesting of *if...else* statements, The *else ... if* ladder, The switch statement, The ?: operator, The Goto statement

7 Hours

Unit-VI

Decision making and Looping

The *while* statement, The *do* statement, The *for* statement, Jumps in Loops.

6 Hours

Unit-VII

Arrays

One-dimensional Arrays, Declaration of one-dimensional Arrays, Initialization of one-dimensional Arrays, Two-dimensional Arrays, Initializing two-dimensional Arrays.

6 Hours

Unit-VIII

User-defined Functions

Need for User-defined Functions, A multi-function Program, Elements of User-defined Functions, Definition of Functions, Return Values and their Types, Function Calls, Function Declaration, Category of Functions, No Arguments and no Return Values, Arguments but no Return Values, Arguments with Return Values, No Argument but Returns a Value, Functions that Return Multiple Values.

7 Hours

Text Books

1. Introduction to Computers, Peter Norton, Sixth Edition, Tata McGraw Hill, 2005
2. Programming in ANSI C, E. Balagurusamy, Tata McGraw Hill – III Edition.

Reference Books

1. Introduction to Computer Science, ITL Education Solutions Ltd., Pearson Education, 2004.
2. Fundamentals of Computers, V.Rajaraman, 4th Edition, PHI 2005.
3. Programming Techniques through C, M.G. V. Murthy, Pearson Education, 2002.

Question Paper pattern

One full question to be set from each of the 8 units. Student is required to answer 5 full questions selecting at least 2 full questions from each part.

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ELEMENTS OF MECHANICAL ENGINEERING

Sub Code	:	**06 EME 14 / 06 EME 24**	**IA Marks**	:	**25**
Hrs/ Week	:	**04**	**Exam Hours**	:	**03**
Total Hrs.	:	**52**	**Exam Marks**	:	**100**

PART – A

Unit-I

Energy and Steam

Forms, Sources and Classification of energy. Utilization of energy with simple block diagrams. Steam formation. Types of steam. Steam properties – Specific Volume, Enthalpy and Internal energy. (simple numerical problems)

Steam boilers – classification, Lancashire boiler, Babcock and Wilcox boiler, boiler mountings, accessories, their locations and applications. (No sketches for mountings and accessories)

7 Hours

Unit-II

Turbines

Steam turbines – Classification, Principle of operation of Impulse and reaction. Delaval's turbine, Parson's turbine. Compounding of Impulse turbines.

Gas turbines – Classification, Working principles and Operations of Open cycle and Closed cycle gas turbines.

Water turbines –Classification, Principles and operations of Pelton wheel, Francis turbine and Kaplan turbine

7 Hours

Unit-III

Internal Combustion Engines

Classification, I.C. Engines parts, 2/4 – Stroke Petrol and 4-stroke diesel engines. P-V diagrams of Otto and Diesel cycles. Simple problems on indicated power, brake power, indicated thermal efficiency, brake thermal efficiency, mechanical efficiency and specific fuel consumption.

6 Hours

Unit-IV

Refrigeration and Air conditioning

Refrigerants, properties of refrigerants, list of commonly used refrigerants. Refrigeration - Definitions - Refrigerating effect, Ton of Refrigeration, Ice making capacity, COP, Relative COP, Unit of Refrigeration. Principle and working of vapor compression refrigeration and vapor absorption refrigeration. Principles and applications of air conditioners, Room air conditioner.

6 Hours

PART – B

Unit-V

Lathe and Drilling Machines

Lathe - Principle of working of a Centre Lathe. Parts of a lathe. Operations on lathe - Turning, Facing, Knurling, Thread Cutting, Drilling, Taper Turning by Tailstock offset method and Compound slide swiveling method. Specification of Lathe.

Drilling Machine – Principle of working and classification of Drilling Machines. Bench Drilling Machine, Radial Drilling Machine. Operations on Drilling Machine -Drilling, Boring, Reaming, Tapping, Counter Sinking, Counter Boring and Spot facing. Specification of radial drilling machine.

7 Hours

Unit-VI

Milling and Grinding Machines

Milling Machine – Principle of Milling, Types of Milling Machines. Principle & Working of Horizontal and Vertical Milling Machines. Milling Processes - Plane Milling, End Milling, Slot Milling, Angular Milling, Form Milling, Straddle Milling and Gang Milling. Specification of Universal Milling Machine.

Grinding Machine – Principle and classification of Grinding Machines. Abrasives- Definition, types and Applications. Bonding Materials. Type of Grinding Machines, Principle and Working of Surface Grinding, Cylindrical Grinding and Centerless Grinding.

7 Hours

Unit-VII

Joining Processes, Lubrication and Bearings

Soldering, Brazing and Welding

Definitions. classification and method of Soldering, Brazing and Welding and Differences. Brief Description of Arc Welding and Oxy-Acetylene Welding.

Lubrication and Bearings

Lubricants-Classification and properties. Screwcap, Tell-Tale, Drop feed, Wick feed and Needle Lubricators. Ring, Splash and Full pressure lubrication. Classification of Bearings, Bushed bearing, Pedestal bearing, Pivot bearing, Collar Bearings and Antifriction Bearings.

6 Hours

Unit-VIII

Power Transmission

Belt Drives - Classification and applications, Derivations on Length of belt.

Definitions - Velocity ratio, Creep and slip, Idler pulley, stepped pulley and fast & loose pulley.

Gears - Definitions, Terminology, types and uses. Gear Drives and Gear

Trains - Definitions and classifications, Simple problems.

6 Hours

Text Book:

1. A Text Book of Elements of Mechanical Engineering - S. Trymbaka Murthy, 3rd revised edition 2006, I .K. International Publishing House Pvt. Ltd., New Delhi.

Reference Books :

1. A text Book of Elements of Mechanical Engineering – K.R. Gopalkrishna, Subhash Publishers, Bangalore.
2. The Elements of Workshop Technology - Vol I & II , SKH Chowdhary, AKH Chowdhary , Nirjhar Roy, 11th edition 2001, Media Promotors and Publishers, Mumbai.

Scheme of Examination

One full question to be set from each unit. Students have to answer any **Five** full questions out of eight questions, choosing at least **two** questions from **Part A** and two questions from **Part B.**

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COMPUTER AIDED ENGINEERING DRAWING

Sub Code	**: 06 CED 14 / 06 CED 24**	**IA Marks**	**: 25**
Hrs/ Week	**: 06 (Instruction 2 hr. +Sketching & Practice 4 hr.)**	**Exam Hours**	**: 03**
Total Hrs.	**: 84 (Instruction 28 hr. +Sketching & Practice 56 hr.)**	**Exam Marks**	**: 100**

1. Introduction to Computer Aided Sketching

Introduction, Drawing Instruments and their uses, BIS conventions, Lettering, Dimensioning and free hand practicing.

Computer screen, layout of the software, standard tool bar/menus and description of most commonly used tool bars, navigational tools. Co-ordinate system and reference planes. Definitions of HP, VP, RPP & LPP. Creation of 2D/3D environment. Selection of drawing size and scale. Commands and creation of Lines, Co-ordinate points, axes, poly-lines, square, rectangle, polygons, splines, circles, ellipse, text, move, copy, off-set, mirror, rotate, trim, extend, break, chamfer, fillet, curves, constraints viz. tangency, parallelism, inclination and perpendicularity. Dimensioning, line conventions, material conventions and lettering.

12 Hours

2. Orthographic Projections

Introduction, Definitions - Planes of projection, reference line and conventions employed, Projections of points in all the four quadrants, Projections of straight lines (located in First quadrant/first angle only), True and apparent lengths, True and apparent inclinations to reference planes (No application problems).

12 Hours

3. Orthographic Projections of Plane Surfaces (First Angle Projection Only)

Introduction, Definitions–projections of plane surfaces–triangle, square, rectangle, rhombus, pentagon, hexagon and circle, planes in different positions by change of position method only (No problems on punched plates and composite plates).

12 Hours

4. Projections of Solids (First Angle Projection Only)

Introduction, Definitions – Projections of right regular tetrahedron,

hexahedron (cube), prisms, pyramids, cylinders and cones in different positions. (No problems on octahedrons and combination solid)

24 Hours

5. Sections And Development of Lateral Surfaces of Solids

Introduction, Section planes, Sections, Section views, Sectional views, Apparent shapes and True shapes of Sections of right regular prisms, pyramids, cylinders and cones resting with base on HP. (No problems on sections of solids)

Development of lateral surfaces of above solids, their frustums and truncations. (No problems on lateral surfaces of trays, tetrahedrons, spheres and transition pieces).

12 Hours

6. Isometric Projection (Using Isometric Scale Only)

Introduction, Isometric scale, Isometric projection of simple plane figures, Isometric projection of tetrahedron, hexahedron(cube), right regular prisms, pyramids, cylinders, cones, spheres, cut spheres and combination of solids (Maximum of three solids).

12 Hours

Text Books

1. Engineering Drawing - N.D. Bhatt & V.M. Panchal, 48th edition, 2005-Charotar Publishing House, Gujarat.
2. A Primer on Computer Aided Engineering Drawing-2006, Published by VTU, Belgaum.

Reference Books

1. Computer Aided Engineering Drawing - S. Trymbaka Murthy, -I.K. International Publishing House Pvt. Ltd., New Delhi, 3rd revised edition- 2006.
2. Engineering Graphics - K.R. Gopalakrishna, 32nd edition, 2005- Subash Publishers Bangalore.
3. Fundamentals of Engineering Drawing with an Introduction to Interactive Computer Graphics for Design and Production-Luzadder Warren J., Duff John M., Eastern Economy Edition, 2005-Prentice-Hall of India Pvt. Ltd., New Delhi.

Conducting classes

Classes may be conducted in two slots/ week of 3 hrs. each (Instruction 1 hr. +Sketching & Practice 2 hrs.)

Scheme of Evaluation for Internal Assessment (25 Marks)

(a) 15 Marks for Class work (Sketching & Computer Aided Engineering drawing printouts in A4 size sheets).

(b) 10 Marks for test in the same pattern as that of the main examination.(Better of the two Tests).

All the solutions must be valued on the spot by examining the sketches, display and the hard copies. All the sketches including the computer printouts must be submitted and they must be preserved for one year.

Scheme of Examination

1. Chapter 1 is only for practice and Internal Assessment and not for examination.
2. Separate Question paper must be set for each batch of students, jointly by the Internal & External examiners.
3. A maximum of **Three** questions must be set as per the following pattern *(No mixing of questions from different Chapters).*

Q. No.	From Chapters	Marks Allotted
1	Chapter 2 or Chapter 3	30
2	Chapter 4	40
3	Chapter 5 or Chapter 6	30
Total		**100**

Scheme of Evaluation

Q. No.	Solutions & Sketching on graph book	Computer display & printout	Total Marks
1	10 Marks	20 Marks	30
2	15 Marks	25 Marks	40
3	15 Marks	15 Marks	30
Total	**40 Marks**	**60 Marks**	**100**

Students have to submit the computer printouts and the sketches drawn on the graph sheets at the end of the examination. Both Internal & External examiners have to jointly evaluate the solutions (sketches) and computer display & printouts of each student for 100 marks (40 marks for solutions & sketches + 60 marks for computer display and printouts) and submit the marks list along with the solution (sketches) on graph sheets & computer printoutsin separate covers.

4. Each batch must consist of a minimum of 10 students and a maximum of 12 students.
5. Examination can be conducted in parallel batches, if necessary.

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BASIC ELECTRICAL ENGINEERING

Sub Code	**: 06 ELE 15/06 ELE 25**	**IA Marks**	**: 25**
Hrs/ Week	**: 04**	**Exam Hours**	**: 03**
Total Hrs.	**: 52**	**Exam Marks**	**: 100**

PART – A

Unit-I

1–a) **D. C. Circuits:** Ohm's Law and Kirchhoff's current Law, Kirchhoff's voltage law – applications for the analysis of only series and parallel resistive circuits excited by independent voltage sources; Power and Energy in such circuits. Illustrative examples.

04 Hours

1–b) **Electromagnetism:** Faradays Laws, Lenz's Law, Fleming's Rules, Statically and Dynamically induced E.M.F.'s. Concept of self and mutual inductance. Concept of coefficient of coupling. Energy stored in magnetic field, Illustrative examples.

03 Hours

Unit-II

2 **Single-phase A.C. Circuits:** Generation of sinusoidal AC voltage, definition of average value, R.M.S. value, form factor and peak factor of sinusoidally varying voltage and current, meaning of lagging or leading of sinusoidal wave. Given a sinusoidally varying voltage or current as a function of time, obtaining its phasor representation and vice versa. Definition of real power, reactive power, apparent power and power factor. Analysis with phasor diagram, of circuits with R,L,C, R-L, R-C, R-L-C elements. Illustrative examples involving series and series parallel circuits.

07 Hours

Unit-III

3 **Three Phase Circuits:** Necessity and advantages of three phase systems, Meaning of Phase sequence, balanced supply and load. Obtaining the relationship between line and phase values for balanced star and delta connections. Power in balanced three-phase circuits. Illustrative examples.

06 Hours

Unit-IV

4–a) **Measuring Instruments:** Construction and Principle of operation of dynamometer type wattmeter and single-phase induction type energy meter (problems excluded)

03 Hours

4–b) **Domestic Wiring:** Two-way position and three-way position control of a lamp. Necessity and types of earthing. Elementary discussion on fuses. Electric shock and precautions against it.

03 Hours

PART – B

Unit-V

5. **DC Machines:** Working principle of DC machine as a generator and motor. Constructional features. E.M.F. equation of generator and illustrative examples. Back E.M.F. and torque equations of D.C. motors. Types of D.C. motors — characteristics and applications. Necessity of a starter for motor. Illustrative examples on motors.

07 Hours

Unit-VI

6. **Transformers:** Principle of operation and construction of single phase transformers (core and shell types). E.M.F. equation, power losses, efficiency and voltage regulation (O.C. and S.C. tests. equivalent circuits and phasor diagrams are excluded), illustrative problems on E.M.F. equation and efficiency only.

07 Hours

Unit-VII

7. **Synchronous Generators:** Principle of operation. Types and constructional features. E.M.F. equation. Concept of winding factor (excluding derivation). Illustrative examples on E.M.F. equation and efficiency only.

06 Hours

Unit-VIII

8. **Three Phase Induction Motors:** Concept of rotating magnetic field. Principle of operation. Constructional features. Slip and its significance. Applications of squirrel - cage and slip - ring motors. Necessity of a starter. Illustrative examples only on slip calculations.

06 Hours

Text Books:

1. E. Hughes; "Electrical Technology", International Students 9th Edition, Pearson, 2005.
2. Rajendra Prasad, "Fundamentals of Electrical Engineering", Prentice-Hall of India Pvt. Ltd., 2005, ISBN: 81-203-2729-2.

Reference Books:

1. K.A. Krishnamurthy and M.R Raghuveer, "Electrical, Electronics and Computer Engineering", 2nd Edition, T.M.H., 2001.

Question Paper Pattern

1. Eight questions with 20 marks each to be set selecting one question based on each of the units 1 to 8.
2. Any five full questions are to be answered choosing at least two from each section.
3. Every question shall have a maximum of 3 subdivisions.
4. Preferably 50% of each question shall be based on numerical problem.

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BASIC ELECTRONICS

Sub Code	**:**	**06 ELN 15 / 06 ELN 25**	**IA Marks**	**:**	**25**
Hrs/ Week	**:**	**04**	**Exam Hours**	**:**	**03**
Total Hrs.	**:**	**52**	**Exam Marks**	**:**	**100**

PART – A

Unit-I

Semiconductor diodes and applications:

p-n junction diode, Characteristics and Parameters, Diode approximations, DC load line, Temperature dependence of p-n characteristics, AC equivalent circuits, Zener diodes, Half-wave diode rectifier, Ripple factor, Full-wave diode rectifier, Other full-wave circuits, Shunt capacitor - Approximate analysis of capacitor filters, Power supply performance, Zener diode voltage regulators, Numerical examples as applicable (T1-2.1,2.2,2.3,2.4:2.5,2.6,2.9,R1- 20.1, 20.2, 20.3, 20.4, 20.8; T1- 3.5, 3.6).

07 Hours

Unit-II

Transistors:

Bipolar Junction transistor, Transistor Voltages and currents, amplification, Common Base, Common Emitter and Common Collector Characteristics, DC Load line and Bias Point.

06 Hours

Unit-III

Biasing methods:

Base Bias, Collector to Base Bias, Voltage divider Bias, Comparison of basic bias circuits, Bias circuit design, Thermal Stability of Bias Circuits (Qualitative discussions only).

(For Units II & III: T1-4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 5.1, 5.2, 5.3, 5.4, 5.5, 5.7, 5.9).

06 Hours

Unit-IV

Other Devices:

Silicon Controlled Rectifier (S.C.R), SCR Control Circuits, More S.C.R applications; Unijunction transistor, UJT applications, Junction Field effect Transistors(Exclude Fabrication and Packaging), JFET Characteristics, FET Amplifications, Numerical examples as applicable (T1 -19.1, 19.2, 19.3, 19.7, 9.1, 9.2, 9.4)

07 Hours

PART – B

Unit-V

Amplifiers & Oscillators:

Decibels and Half power points, Single Stage CE Amplifier and Capacitor coupled two stage CE amplifier(Qualitative discussions only), Series voltage negative feedback and Additional effects of Negative feed back(Qualitative discussions only), The Barkhausen Criterion for Oscillations, BJT RC phase shift oscillator, Hartley ,Colpitts and crystal oscillator (Qualitative discussions only) Numerical problems as applicable.

(T1 - 8.2, 12.1, 12.3, 13.1, 13.7; R1-17.15, 17.16, 17.17, 17.18, 17.19)

06 Hours

Unit-VI

Introduction to Operational Amplifiers:

Ideal OP-AMP, Saturable property of an OP-AMP inverting and non inverting OP-AMP circuits, need for OP-AMP, Characteristics and applications - voltage follower, addition, subtraction, integration, differentiation; Numerical examples as applicable Cathode Ray Oscilloscope (CRO)

(T2 -11.1-11.8, 9.6)

06 Hours

Unit-VII

Communication Systems:

Block diagram, Modulation, Radio Systems, Superhetrodyne Receivers, Numerical examples as applicable (T2 - 13.1, 13.2, 13.4, 13.5)

Number Systems:

Introduction, decimal system, Binary, Octal and Hexadecimal number systems, addition and subtraction, fractional number, Binary Coded Decimal numbers.

07 Hours

Unit-VIII

Digital Logic:

Boolean algebra, Logic gates, Half-adder, Full-adder, Parallel Binary adder.

(For Number Systems & Digital Logic: T2:.14.1 to 14.14)

07 Hours

Text Books:

1. **(T1)** Electronic Devices and Circuits: David. A. Bell; PHI, New Delhi, 2004
2. **(T2)** Electrical and Electronics & Computer Engineering for Scientists and Engineers Second Edition -K.A. Krishnamurthy & M.R. Raghuveer-New

   Age International Publishers (Willey Eastern) 2001

Reference Books:

1. **(R1)**. Electronic Devices and Circuits: Jacob Millman, Christos C. Halkias TMH, 1991 Reprint 2001
2. **(R2)** Electronic Communication Systems, George Kennedy, TMH 4th Edition
3. **(R3)** Digital Logic and Computer Design, Morris Mano, PHI, EEE

Question Paper Pattern: Student should answer FIVE full questions out of 8 questions to be set each carrying 20 marks, **selecting at least TWO questions from each part.**

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WORKSHOP PRACTICE

Sub Code	**: 06 WSL 16/06 WSL 26**	**IA Marks**	**: 25**
Hrs/ Week	**: 03**	**Exam Hours**	**: 03**
Total Hrs.	**: 42**	**Exam Marks**	**: 50**

1. Fitting

a. Study of fitting tools

b. Study of fitting operations & joints

c. Minimum 5 models involving rectangular, triangular, semi circular and dovetail joints.

2. Welding

d. Study of electric arc welding tools & equipments

e. Minimum 4 Models- electric arc welding-Butt joint, Lap joint, T-joint & L-joint.

3. Study and demonstration of Carpentry tools, joints and operations.

4. Study and demonstration of Sheet metal and soldering work.

Scheme of Examination:

Fitting	30 Marks
Welding	10 Marks
Viva Voce	10 marks

Reference Book:

1. The Elements of Workshop Technology -, Vol 1 & 2, S.K.H. Choudhury, A.K.H.Choudhury, Nirjhar Roy, 11th edition, 2001, Media Promoters and Publishers, Mumbai.

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COMPUTER PROGRAMMING LABORATORY

Sub Code : **06 CPL 16 /06 CPL 26**	**IA Marks** :	**25**
Hrs/ Week : **03**	**Exam Hours** :	**03**
Total Hrs. : **42**	**Exam Marks** :	**50**

PART – A

1. Create a document using a suitable word processing package, like MS Word, with at least three paragraphs and perform the following operations:
   - (i) Set left margin 1" and right margin 0.75"
   - (ii) Centre the heading and make it bold. Increase the font size
   - (iii) Underline the specified words in the document and change them to italics
   - (iv) Conduct spell check and correct them suitably
   - (v) Demonstrate use of numbering and bullets
   - (vi) Exchange paragraphs 2 and 3 using cut and paste facility
   - (vii) Put suitable headers and footers
   - (viii) Count the number of words and lines
   - (ix) Demonstrate use of drawing tools
   - (x) Include suitable logo/emblem/symbol

2. Create a formal letter using a suitable word processing package, like MS Word, to place a purchase order for procurement of books, having the following information.

Sl. No.	Title of the book	Details of the book			No. of copies
		Author	Edition	Publisher	

3. Create and execute a DOS batch file HELPDOS.BAT which provides on-line help facility for the following DOS commands – date, time.
4. Create and execute a DOS batch file MYMOVE.BAT with 2 parameters, which creates a new directory (given by parameter 1) and moves the file

(given by parameter 2) from the current directory to newly created directory.

5. Write a C program to find and output all the roots of a given quadratic equation, for non-zero coefficients. (Using *if...else* statement)

6. Write a C program to simulate a simple calculator that performs arithmetic operations like addition, subtraction, multiplication, and division only on integers. Error message should be reported, if any attempt is made to divide by zero. (Using *switch* statement)

7. Write a C program to generate and print first 'N' Fibonacci numbers.

   (Using looping constructs)

8. Write a C program to find the GCD and LCM of two integers and output the results along with the given integers. Use Euclid's algorithm. (Using looping constructs)

9. Write a C program to reverse a given four digit integer number and check whether it is a palindrome or not. Output the given number with suitable message.

   (Using looping constructs)

10. Write a C program to find whether a given number is prime or not. Output the given number with suitable message. (Using looping constructs)

PART – B

11. Write a C program to input N real numbers in ascending order into a single dimension array. Conduct a binary search for a given key integer number and report success or failure in the form of a suitable message.

12. Write a C program to input N integer numbers into a single dimension array. Sort them in ascending order using bubble sort technique. Print both the given array and the sorted array with suitable headings.

13. Write a C program to evaluate the given polynomial $f(x) = a_4x^4 + a_3x^3 + a_2x^2 + a_1x + a_0$ for given value of x and the coefficients using Horner's method. (Using single dimension arrays to store coefficients)

14. Write a C program to read two matrices A(M x N) and B(P x Q) and compute the product of A and B after checking compatibility for multiplication. Output the input matrices and the resultant matrix with suitable headings and format. (Using two dimension arrays where array size M, N, P,Q $\leq$ 3)

15. Write C user defined functions

(i) to input N integer numbers into a single dimension array.

(ii) to conduct a linear search.

Using these functions, write a C program to accept the N integer numbers & given key integer number and conduct a linear search. Report success or failure in the form of a suitable message.

16. Write C user defined functions

(i) to input N integer numbers into a single dimension array.

(ii) to sort the integer numbers in ascending order using bubble sort technique.

(iii) To print the single dimension array elements.

Using these functions, write a C program to input N integer numbers into a single dimension array, sort them in ascending order, and print both the given array & the sorted array with suitable headings.

17. Write C user defined functions

(i) to input N integer numbers into a single dimension array.

(ii) to sort the integer numbers in descending order using selection sort technique.

(iii) To print the single dimension array elements.

Using these functions, write a C program to input N integer numbers into a single dimension array, sort them in descending order, and print both the given array & the sorted array with suitable headings.

18. Write C user defined functions

(i) to input N real numbers into a single dimension array.

(ii) compute their mean.

(iii) compute their variance

(iv) compute their standard deviation.

Using these functions, write a C program to input N real numbers into a single dimension array, and compute their mean, variance & standard deviation. Output the computed results with suitable headings.

19. Write C user defined functions

(i) To read the elements of a given matrix of size M x N

(ii) To print the elements of a given matrix of size M x N

(iii) To compute the product of two matrices

Using these functions, write a C program to read two matrices A(M x N) and B(P x Q) and compute the product of A and B after checking compatibility for multiplication. Output the input matrices and the resultant matrix with suitable headings and format.

(Using two dimension arrays where array size M, N, P,Q ≤ 3)

20. Write a C program to read a matrix A(M x N) and to find the following using user defined functions:

    (i) Sum of the elements of the specified row

    (ii) Sum of the elements of the specified column

    (iii) Sum of all the elements of the matrix

    Output the computed results with suitable headings.

Reference Book :

Programming Techniques through C, M.G. V. Murthy, Pearson Education, 2002

Note: In the practical examination the student has to answer two questions. One question from Part A and one question from Part B will be selected by the student by lots. All the questions listed in the syllabus have to be included in the lots. The change of question (Part A only / Part B only / Both Part A & Part B) has to be considered, provided the request is made for the same, within half an hour from the start of the examination. The allotment of marks is as detailed below:

Sl. No.	Activity		Max. Marks
1.	Procedure Writing program & procedure for the assigned problems along with algorithms / flowchart	Part A	5*
		Part B	5*
2.	Conduction Execution of the program and showing the results in proper format	Part A	10
		Part B	20
3.	Viva-voce**		10
Total Max. Marks			50
Minimum passing Marks (40% of Max. Marks)			20

* To be considered as zero if student has been allowed change of question.

** One of the viva-voce questions shall be to ask the student to identify some of the following parts of a typical Personal Computer System: Motherboard, Extension board, SMPS, CPU, HDD, FDD, Primary Memory, Various ports.

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ENGINEERING PHYSICS LABORATORY

Sub Code	**: 06 PHYL 17/06 PHYL 27**	**IA Marks**	**: 25**
Hrs/ Week	**: 03**	**Exam Hours**	**: 03**
Total Expts.	**: 10 (To be completed)**	**Exam Marks**	**: 50**

Special Note : (Students must conduct two experiments in three Hours in the Lab examination)

1. Series and Parallel LCR Circuits
2. I-V Characteristics of a Zener Diode
3. Characteristics of a Transistor
4. Band Gap of a Semiconductor
5. Ultrasonic Interferometer (Measurement of Velocity of Sound in Solids and Liquids)
6. Dielectric Constant (Measurement of Dielectric Constant)
7. Magnetic properties (B-H Graph Method)
8. Diffraction (Measurement of wavelength of Laser / Hg Source using diffraction grating)
9. Planck's Constant (Determination of Planck's Constant using LED or using the principle of photoelectric effect)
10. Electrical Resistivity (Four probe method)
11. Verification of Stefan's law
12. Determination of Fermi Energy

Reference Book

	Title	Author/s / Editor	Publishers
1	**Laboratory Manual in Applied Physics –** Second Edition	H.Sathyaseelan	New Age International

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ENGINEERING CHEMISTRY LABORATORY

Sub Code	**: 06 CHEL 17/06 CHEL 27**	**IA Marks**	**: 25**
Hrs/ Week	**: 03**	**Exam Hours**	**: 03**
Total Hrs.	**: 42**	**Exam Marks**	**: 50**

(Common to all branches with effective from academic year 2006-2007)
(For Examination, one experiment from Part-A and Part-B shall be set. Different experiments may be set from Part-A and common experiment from Part-B).

PART – A

1. Potentiometric estimation of FAS using standard $K_2Cr_2O_7$ solution.
2. Colorimetric determination of copper.
3. Conductometric estimation of an Acid using standard NaOH solution .
4. Flame photometric estimation of sodium in the given sample of water.
5. Determination of pKa of a weak acid using pH meter.
6. Determination of viscosity coefficient of a given liquid using Ostwald's viscometer.

PART – B

1. Determination of Total Hardness of a sample of water using disodium salt of EDTA.
2. Determination of Calcium Oxide (CaO) in the given sample of cement by Rapid EDTA method.
3. Determination of percentage of Copper in brass using standard sodium thiosulphate solution.
4. Determination of Iron in the given sample of Haematite ore solution using potassium dichromate crystals by external indication method.
5. Determination of Chemical Oxygen Demand (COD) of the given industrial waste Water sample.
6. Determination of Dissolved Oxygen in the given water sample by Winkler method.

Examination – First experiment is a common experiment from Part B. Second experiment is different, from Part A or Part B.

Reference:

1. Vogels text book of quantitative inorganic analysis, revised by J. Bassett, R.C. Denny, G.H. Jeffery, 4th Ed.
2. Practical Engineering Chemistry by Sunita and Ratan.

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CONSTITUTION OF INDIA AND PROFESSIONAL ETHICS

Sub Code	**: 06 CIP 18/06 CIP 28**	**IA Marks**	**:**	**25**
Hrs/ Week	**: 02**	**Exam Hours**	**:**	**02**
Total Hrs.	**: 26**	**Exam Marks**	**:**	**50**

1. Preamble to the constitution of India. Fundamental rights under Part – III – details of Exercise of Rights, Limitations & Important cases. **04 Hours**
2. Relevance of Directive principles of State Policy under Part – IV. Fundamental duties & their significance. **03 Hours**
3. Union Executive – President, Prime Minister, Parliament & the Supreme Court of India. **03 Hours**
4. State executive – Governors, Chief Minister, State Legislator and High Courts. **03 Hours**
5. Constitutional Provisions for Scheduled Castes & Tribes, Women & Children & Backward classes. Emergency Provisions. **04 Hours**
6. Electoral process, Amendment procedure, 42nd, 44th, 74th, 76th, 86th and 91st Constitutional amendments. **03 Hours**
7. Scope & aims of engineering Ethics. Responsibility of Engineers. Impediments to responsibility. **03 Hours**
8. Honesty, Integrity and reliability, risks, safety & liability in engineering. **03 Hours**

Text Books:

1 Durga Das Basu: "Introduction to the Constitution of India" (Students Edn.) Prentice – Hall EEE, 19th/20th Edn., 2001.

2 "Engineering Ethics" by Charles E.Haries, Michael. S.Pritchard and Michael J.Robins Thompson Asia, 2003-08-05.

Reference Books:

1 "An Introduction to Constitution of India" by M.V.Pylee, Vikas Publishing, 2002.

2 "Engineering Ethics" by M. Govindarajan, S.Natarajan, V.S. Senthilkumar., Prentice – Hall of India Pvt. Ltd. New Delhi, 2004.

Scheme of examination:

Question paper is of objective type. Students have to pass this subject compulsorily. However, marks will not be considered for awarding class/rank.

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ENVIRONMENTAL STUDIES

Sub Code	**: 06 CIV 18/ 06 CIV 28**	**IA Marks**	**:**	**25**
Hrs/ Week	**: 02**	**Exam Hours**	**:**	**02**
Total Hrs.	**: 26**	**Exam Marks**	**:**	**50**

PART – A

Unit-I

Environment -_ Definition, Eco system — Balanced ecosystem, Human activities - Food, Shelter, Economic and Social Security.

03 Hours

Unit-II

Effects of human activities on environment - Agriculture, Housing, Industry, Mining, and Transportation activities, Environmental Impact Assessment. Sustainable Development.

03 Hours

Unit-III

Natural Resources - Water resources - Availability and Quality aspects. Water borne diseases, Water induced diseases, Fluoride problem in drinking water. Mineral Resources, Forest Wealth, Material Cycles - Carbon, Nitrogen and Sulphur Cycles.

04 Hours

Unit-IV

Energy - Different types of energy, Electro-magnetic radiation. Conventional and Non - Conventional sources - Hydro Electric, Fossil fuel based, Nuclear, Solar, Biomass and Bio-gas. Hydrogen as an alternative future source of Energy.

04 Hours

Unit-V

Environmental Pollution and their effects. Water pollution. Land pollution . Noise pollution . Public Health aspects.

03 Hours

PART – B

Unit-VI

Current Environmental issues of importance:

Population Growth, Climate change and Global warming - Effects, Urbanization, Automobile pollution.

03 Hours

Unit-VII

Acid Rain, Ozone layer depletion, Animal Husbandry.

03 Hours

Unit-VIII

Environmental Protection - Role of Government, Legal aspects, Initiatives by Non - Governmental Organizations (NGO), Environmental Education, Women Education.

03 Hours

Text Books:

1. Environmental Studies - Benny Joseph - Tata McGrawHill-2005.
2. Environmental Studies - Dr. D.L Manjunath, Pearson Education - 2006

Reference Books:

1. Principles of Environmental Science and Engineering - P. Venugopala Rao, Prentice Hall of India.
2. Environmental Science and Engineering - Meenakshi, Prentice Hall India.

Question paper is of objective type. Students have to pass the subject compulsorily. However, marks will not be considered for awarding class/ rank.

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ENGINEERING MATHEMATICS – II

Sub Code	**: 06 MAT 21**		**IA Marks**	**:**	**25**
Hrs/ Week	**: 04**		**Exam Hours**	**:**	**03**
Total Hrs.	**: 52**		**Exam Marks**	**:**	**100**

PART – A

Unit-I

Differential Calculus:

Radius of curvature – Cartesian, parametric, polar and pedal forms. Rolle's theorem (without proof). Lagrange's and Cauchy's mean value theorems. Taylor's Theorem for a function of a single variable and Maclaurin's series expansions (without proof).

6 Hours

Unit-II

Indeterminate forms – L'Hospital's rule (without proof) Taylor's theorem for a function of two variables (without proof)–Maxima and Minima for function of two variables. Lagrange's method of undetermined multipliers for extreme values (with one subsidiary condition).

6 Hours

Unit-III

Integral Calculus:

Multiple Integrals - Evaluation by change of order of integration –change of variables and applications to area and volume. Beta and gamma functions.

8 Hours

Unit-IV

Vector Integration:

Line integrals, Surface integrals and volume integrals. Green's, Stoke's, Gauss's theorems (without proof) and problems. Orthogonal curvilinear coordinates.

8 Hours

PART – B

Unit-V

Differential Equations:

Linear differential equations of second and higher order with constant coefficients. Method of undetermined coefficients.

6 Hours

Unit-VI

Method of variation of parameters. Solutions of Cauchy's homogeneous linear equation and and Legender's linear differential equations - solutions of initial and boundary value problems.

6Hours

Unit-VII

Laplace Transforms:

Definition - Transforms of elementary functions. Derivatives and integrals of transforms – Problems. Periodic function. Unit step function and unit impulse function.

6 Hours

Unit-VIII

Inverse transforms – Properties. Convolution Theorem. Solutions of linear differential equations and simultaneous differential equations. Applications to Engineering problems.

6 Hours

Text Books:

1. B. S. Grewal, "Higher Engg. Mathematics", 36th Edn, July 2001.

Chapter – 4:	4.4 to 4.8 & 4.13, 4.14
Chapter – 5:	5.9, 5.12, 5.13
Chapter – 7:	7.1 to 7.5. 7.6(2), 7.7, 7.14 to 7.16
Chapter – 8:	8.11 to 8.21
Chapter – 13:	13.1 to 13.9, 13.11
Chapter – 14:	14.1, 14.2
Chapter – 21:	21.2 to 21.19

Reference Book:

1. Advanced Engineering Mathematics by – E Kreyszing
   - John Wiley & Sons, 6th Edn.
2. A Short Course in Differential Equations – Raincille E.D.,
   - 4th Edition 1969

Note: 1) One Question is to be set from each Unit

2) Students have to answer five questions, choosing at least two questions from each Part.

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FUNCTIONAL ENGLISH

Introduction	Importance of Languages	
Grammer	Parts of Speech, Usage of Preposition and Article, Punctuation	5 Hours
Tenses & Degrees of Comparison		3 Hours
Transformation of Sentences	Active-Passive, Affirmative-Negative, Exclamatory-Assertive, Interrogative-Assertive, Kinds of sentences	5 Hours
Direct-Indirect Speech		5 Hours
Vocabulary Usage	Homonyms, Correcting Spelling, One-word equivalents	7 Hours
Precis Writing		3 Hours
Essay/Report Writing		5 Hours
Letter Writing	Personal, Official, Applications	5 Hours
Idioms & Phrases	Meaning & Usage in sentences	5 Hours
Comprehension	Of an unseen passage	2 Hours
Elaboration	Expansion of ideas, proverbs	2 Hours
Presentation	Preparation of materials and presentation – step	3 Hours

Suggested Text Books:

1. Basic Grammer, SLN Sharma & K Shankaranarayana, Navakarnataka Publications.
2. New International Business English by Jones, published by Cambridge University Press.

Reference Books:

1. English Rank Scorer, G. Sankaran, Addone Publishing group, Thiruvanantapuram, Kerala
2. English Grammer, Wren & Martin
3. Oxford Guide to Speaking and Writing by John Seely, 2000

KANNADA KALI

SYLLABUS

Lesson 1 :	Introducing each other – 1.
	Personal Pronouns, Possessive forms, Interrogative words.
Lesson 2 :	Introducing each other – 2.
	Personal Pronouns, Possessive forms, Yes/No Type Interrogation
Lesson 3 :	About Ramanaya.
	Possessive forms of nouns, dubitive question, Relative nouns
Lesson 4 :	Enquiring about a room for rent.
	Qualitative and quantitative adjectives.
Lesson 5 :	Enquiring about the college.
	Predicative forms, locative case.
Lesson 6 :	In a hotel
	Dative case defective verbs.
Lesson 7 :	Vegetable market.
	Numeral, plurals.
Lesson 8 :	Planning for a picnic.
	Imperative, Permissive, hortative.
Lesson 9 :	Conversation between Doctor and the patient.
	Verb- iru, negation – illa, non – past tense.
Lesson 10:	Doctors advise to Patient.
	Potential forms, no – past continuous.
Lesson 11:	Discussing about a film.
	Past tense, negation.
Lesson 12:	About Brindavan Garden.
	Past tense negation.
Lesson 13:	About routine activities of a student.
	Verbal Participle, reflexive form, negation.
Lesson 14:	Telephone conversation.
	Past and present perfect past continuous and their negation.
Lesson 15:	About Halebid, Belur.
	Relative participle, negation.
Lesson 16:	Discussing about examination and future plan.
	Simple conditional and negative
Lesson 17:	Karnataka (Lesson for reading)
Lesson 18:	Kannada Bhaashe (Lesson for reading)
Lesson 19:	Mana taruva Sangati alla (Lesson for reading)
Lesson 20:	Beku Bedagalu (lesson for reading)

ಕನ್ನಡ ಮನಸು

1) ಶ್ರಾವಣ (ಕವನ) ದ.ರಾ.ಬೇಂದ್ರೆ

2) ಡಾ. ವಿಶ್ವೇಶ್ವರಯ್ಯ ವ್ಯಕ್ತಿ ಮತ್ತು ಐತಿಹ್ಯ (ವ್ಯಕ್ತಿಚಿತ್ರ) ಎ.ಎನ್. ಮೂರ್ತಿರಾವ್

3) ದೋಣಿ ಹಲಗೋಲುಗಳಲ್ಲಿ (ಪ್ರವಾಸ ಕಥನ) ಶಿವರಾಮ ಕಾರಂತ

4) ಅಣ್ಣಪ್ಪನ ರೇಷ್ಮೆ ಕಾಂಖಲೆ (ಪ್ರಬಂಧ) ಕುವೆಂಪು

5) ನಮ್ಮ ಎಮ್ಮೆಗೆ ಮತ್ತು ತಿಳಿಯುವುದೇ (ವಿನೋದ) ಗೋರೂರು ರಾಮಸ್ವಾಮಿ ಅಯ್ಯಂಗಾರ್

6) ಆನೆಹಳ್ಳದಲ್ಲಿ ಹುಡುಗಿಯರು(ವಿಜ್ಞಾನ ಲೇಖನ) ಜಿ.ಜಿ.ಎಲ್ ಸ್ವಾಮಿ

7) ಬೆಡ್ ನಂ. ಏಳು (ಕತೆ) ತ್ರಿವೇಣಿ

8) ರೊಟ್ಟಿ ಮತ್ತು ಕೋವಿ (ಕವನ) ಸು.ರಂ.ಎಕ್ಕುಂಡಿ

9) ಗುಬ್ಬಚ್ಚಿ ಗೋಡು (ಅಂಕಂ ಬರಹ) ಲಂಕೇಶ್

10) ಚೀಂಕ್ರ ಮೇಸ್ತ್ರಿ ಮತ್ತು ಹಾವುಮೀನು (ಪರಿಸರ ಲೇಖನ) ಕೆ.ಪೂರ್ಣಚಂದ್ರ ತೇಜಸ್ವಿ

11) ಗಾಂಧಿ (ಕತೆ) ಬೆಸಗರಹಳ್ಳಿ ರಾಮಣ್ಣ

12) ಬೆಳ್ಳಿಯ ಹಾಡು (ಕವನ) ಸಿದ್ಧಲಿಂಗಯ್ಯ

13) ಎಲ್ಲ ಹುಡುಗಿಯರ ಕನಸು (ಕವನ) ಸವಿತಾ ನಾಗಭೂಷಣ

14) ನೀರು (ಕತೆ) ಬಸವರಾಜ ಕುಕ್ಕರಹಳ್ಳಿ

15) ಕರ್ನಾಟಕ ಸಂಸ್ಕೃತಿಯ ಸ್ವರೂಪ (ಪರಿಚಯ ಲೇಖನ) ರಹಮತ ತರೀಕೆರೆ

16) ತಂತ್ರಜ್ಞಾನ ಕಲಿಕೆಯಲ್ಲಿ ಭಾಷೆ (ತಂತ್ರಜ್ಞಾನ ಬರಹ) ಎಸ್.ಸುಂದರ್

17) ಕೊಣವೇಗೌಡ (ಕಾವ್ಯ) ಜಾನಪದ