SYLLABUS

DIPLOMA IN ENGINEERING

FIRST YEAR

2007-2008

SEMESTER SYSTEM
K SCHEME

DIRECTORATE OF TECHNICAL EDUCATION, TAMIL NADU

DIPLOMA IN ENGINEERING

FIRST YEAR

SYLLABUS

DIRECTORATE OF TECHNICAL EDUCATION,
TAMIL NADU

DIPLOMA COURSES IN ENGINEERING
(FULL TIME)
SEMESTER SYSTEM
(Implemented from 2007-2008)

K SCHEME

R E G U L A T I O N S

1. Description of the Course

The Course for the Diploma in Engineering shall extend over a period of three academic years, consisting of 6 semesters, as detailed below:

I Semester	July/August	to	December
II Semester	January	to	May
III Semester	July	to	December
IV Semester	January	to	May

V Semester	July	to	December
VI Semester	January	to	May

Each Semester will have 16 weeks duration of study

2. Condition for Admission

Candidates for admission to the Diploma Course shall be required to have passed the S.S.L.C. Examination of the Board of Secondary Education, Tamil Nadu

or

The Anglo-Indian High School Examination with eligibility for Higher Secondary Course in Tamil Nadu

or

The Matriculation examination of Madras & Madurai Universities

or

Any other examination recognized as equivalent to the S.S.L.C. examination, by the Board of Secondary Education, Tamilnadu.

Note: In addition at the time of admission the candidate will have to satisfy certain minimum requirements, which may be prescribed from time to time, with regard to the marks, in the qualifying examinations.

3. Eligibility for the Award of Diploma

No candidate shall be eligible for the Diploma unless he/she has undergone the prescribed course of study for a period of not less than 3 academic years in an institution, affiliated to the State Board of Technical Education and Training, Tamilnadu and has passed the prescribed examination.

4. Subject of study and curriculum outline

The subjects of study shall be in accordance with the syllabus prescribed from time to time, both in theory and practical. The curriculum outline for I Semester and II Semester is given in **Annexure-I**

5. Requirements of Examination

The Examinations shall be conducted at the end of each semester by the State Board of Technical Education & Training, Madras. A candidate will be permitted to appear for the Board's Examination for a subject only if,

i. He/she secures 80% of attendance in the subject concerned

ii. He/she earns a progress certificate in studies from the Head of the institution for having satisfactorily completed the course of study prescribed as required by the regulations, and

iii. His/Her conduct has been satisfactory

Note: It shall be open to the State Board of Technical Education & Training to grant exemption to a candidate, who has failed to keep 80% of attendance prescribed for valid reason, subject to usual conditions.

6. **Examinations**

Board Examinations in all subjects of all the semesters under the scheme of examinations will be conducted at the end of each semester.

The sessional marks in all the subjects will be awarded on the basis of continuous internal assessment made during the concerned semester. For each subject 25 marks are allotted for internal assessment and 75 marks are allotted for Board Examination.

7. Continuous Internal Evaluation

It has been decided to introduce Continuous Internal assessment marks for a total of 25 marks which is to be distributed as follows:

Attendance 5

80%	-	83%	1
84%	-	87%	2
88%	-	91%	3
92%	-	95%	4
96%	-	100%	5

Test 10 marks

A minimum of 3 Tests for a duration of each 2 hours for a total marks of 50 to be conducted. For each subject in the semester out of which the best 2 test marks to be taken and reduced to 10 marks.

Assignment 10 marks

For each subject three Assignments are to be given in a semester and the average marks scored in the assignments should be reduced for 10 marks

All Test Papers after getting the signature from the students, must be kept in the safe custody in the Department for verification and audit. It should be preserved for a Semester for Academic Audit. For practical, the internal assessment marks to be is given as follows:-

a)	Attendance	: 5 Marks
b)	Procedure/ observation and tabulation/other related Practical Work	: 10 Marks
c)	Result	: 5 Marks
d)	Record writing	: 5 Marks
	TOTAL	: 25 Marks

The Record for every completed exercise should be submitted in the subsequent Practical. classes and marks should be allotted for 20 for each exercise as per above allocation.

At the end of the Semester the average of all marks for all exercises should be calculated for 20 marks and 5 marks for attendance as per allocation to be added as given below:

Attendance 5 marks

80%	-	83%	1
84%	-	87%	2
88%	-	91%	3
92%	-	95%	4
96%	-	100%	5

8. **Scheme of Examinations**

The Scheme of examinations for subjects in the I Semester & II Semester are given in **Annexure-II**

9. **Criteria for Pass**

1. No candidate shall be eligible for the award of Diploma unless he/she has undergone the prescribed course of study successfully in an institution approved by AICTE and affiliated to the State Board of Technical Education & Training, Tamil Nadu.
2. A candidate shall be declared to have passed the examination in a subject if he/she secures not less than 40% in theory subject and 50% in practical subject in the Board's Examination out of the total prescribed maximum marks including the sessional and Board Examination marks put together.
3. For a pass in theory subject including Drawing a candidate should secure a minimum of 30 marks out of the maximum examination marks of 75 in Board examination
4. No minimum marks in the Board Examination is required in respect of Practical subjects.

10. **Classification of successful candidates**

Classification of candidates who pass out the final examination from April 2010 onwards (joined in first year in 2007-2008) will be done as specified below:

FIRST CLASS WITH HONOURS

A candidate will be declared to have passed in First Class with Honours if he/she secures not less than 75% of the aggregate marks in all semesters put together, except I and II Semester and passes all the above Semesters in the first appearance itself and completes all papers including that of I & II Semester within the stipulated period of study 3 /3½ /4 years without any break.

FIRST CLASS

A candidate will be declared to have passed in First Class if he/she secures not less than 60% of the aggregate marks in all semesters put together except first year and completes all papers including that of the I & II Semester within the stipulated period of study 3 / 3½ / 4 years without any break

SECOND CLASS

All other successful candidates will be declared to have passed in Second Class.

The above mentioned classification is applicable for the Part-Time students who pass out Final Examination from October 2010 onwards (joined in First Year in 2007-2008)

ANNEXURE-I
CURRICULUM OUTLINE

I SEMESTER

S.No.	SUBJECT	HOURS PER WEEK			
		Theory Hours	Tutorial Drawing	Practical hours	Total Hours
1001	Communication English-I	3	1	-	4
1002	Mathematics	5	2	-	7
1003	Engineering Physics-I	3	-	-	3
1004	Engineering Chemistry-I	3	-	-	3
2005	Engineering Graphics	-	6	-	6
2006	Physics Practical	-	-	2	2
2007	Chemistry Practical	-	-	2	2
2008	Computer Application	-	-	4	4
2009	Workshop Practice	-	-	4	4
	TOTAL	14	9	12	35

II SEMESTER

S.No.	SUBJECT	HOURS PER WEEK			
		Theory Hours	Tutorial Drawing	Practical hours	Total Hours
2001	Communication English-II	3	1	-	4
2002	Applied Mathematics	5	2	-	7
2003	Engineering Physics-II	3	-	-	3
2004	Engineering Chemistry-II	3	-	-	3
2005	Engineering Graphics	-	6	-	6
2006	Physics Practical	-	-	2	2
2007	Chemistry Practical			2	2
2008	Computer Application	-	-	4	4
2009	Workshop Practice	-	-	4	4
	TOTAL	14	9	12	35

I & II Semester Duration: 16 Weeks (of study)

- Physical Education for atleast 3 hours/week shall be made compulsory for all students in the evening after the general working hours of the Institution.

ANNEXURE-II
SCHEME OF EXAMINATION

I SEMESTER

S.No.	SUBJECT	Examination Marks			Mimimum for pass	Duration of Exam
		Internal assess-ment Mark	Board Exam. Marks	Total Marks		Hours
1001	Communication English-I	25	75	100	40	3
1002	Mathematics	25	75	100	40	3
1003	Engineering Physics-I	25	75	100	40	3
1004	Engineering Chemistry-I	25	75	100	40	3
2005	Engineering Graphics	-	-	-	-	-
2006	Physics Practical	-	-	-	-	-
2007	Chemistry Practical	-	-	-	-	-
2008	Computer Application	-	-	-	-	-
2009	Workshop Practice	-	-	-	-	-
	TOTAL	100	300	400		

II SEMESTER

S.No.	SUBJECT	Examination Marks			Mimimum marks for pass	Duration of Exams
		Internal assessment Mark	Board Exam Mark	Total Marks		Hours
2001	Communication English-II	25	75	100	40	3
2002	Applied Mathematics	25	75	100	40	3
2003	Engineering Physics-II	25	75	100	40	3
2004	Engineering Chemistry-II	25	75	100	40	3
2005	Engineering Graphics	25	75	100	40	3
2006	Physics Practical	25	75	100	50	3
2007	Chemistry Practical	25	75	100	50	3
2008	Computer Application	25	75	100	50	3
2009	Workshop Practice	25	75	100	50	3
	TOTAL	225	675	900		

ANNEXURE-I
CURRICULUM OUTLINE

PART-TIME STUDY

I SEMESTER

S.No.	SUBJECT	HOURS PER WEEK			
		Theory Hours	Tutorial Drawing	Practical hours	Total Hours
1001	Communication English-I	3	-	-	3
1002	Mathematics	5	-	-	5
1003	Engineering Physics-I	3	-	-	3
1004	Engineering Chemistry-I	3	-	-	3
2006	Physics Practical	-	-	2	2
2007	Chemistry Practical	-	-	2	2
2009	Workshop Practice	-	-	3	3
	TOTAL	14	-	7	21

II SEMESTER

S.No.	SUBJECT	HOURS PER WEEK			
		Theory Hours	Tutorial Drawing	Practical hours	Total Hours
2001	Communication English-II	3	-	-	3
2002	Applied Mathematics	5	-	-	5
2003	Engineering Physics-II	3	-	-	3
2004	Engineering Chemistry-II	3	-	-	3
2006	Physics Practical	-	-	2	2
2007	Chemistry Practical			2	2
2009	Workshop Practice	-	-	3	3
	TOTAL	14	0	7	21

I & II Semester Duration: 16 Weeks (of study)

III SEMESTER

2005 ENGINEERING GRAPHICS

2008 COMPUTER APPLICATION LAB

ANNEXURE-II

SCHEME OF EXAMINATION

PART-TIME STUDY

I SEMESTER

S.No.	SUBJECT	Examination Marks			Mimimum for pass	Duration of Exam
		Internal assess-ment Mark	Board Exam. Marks	Total Marks		Hours
1001	Communication English-I	25	75	100	40	3
1002	Mathematics	25	75	100	40	3
1003	Engineering Physics-I	25	75	100	40	3
1004	Engineering Chemistry-I	25	75	100	40	3
2006	Physics Practical	-	-	-	-	-
2007	Chemistry Practical	-	-	-	-	-
2009	Workshop Practice	-	-	-	-	-
	TOTAL	100	300	400		

II SEMESTER

S.No.	SUBJECT	Examination Marks			Mimimum marks for pass	Duration of Exams
		Internal assess-ment Mark	Board Exam Mark	Total Marks		Hours
2001	Communication English-II	25	75	100	40	3
2002	Applied Mathematics	25	75	100	40	3
2003	Engineering Physics-II	25	75	100	40	3
2004	Engineering Chemistry-II	25	75	100	40	3
2006	Physics Practical	25	75	100	50	3
2007	Chemistry Practical	25	75	100	50	3
2009	Workshop Practice	25	75	100	50	3
	TOTAL	175	525	700		

1001 COMMUNICATION ENGLISH I
SEMESTER-I

OBJECTIVES

- At the end of the Training Programme, the student will be able to acquire proficiency in the four major skills of communication viz. (i) reading (ii) listening (iii) writing and (iv) speaking towards successfully integrating all of the four skills for the effective use of English in communication, besides a source of inspiration for developing their aesthetic skills and thinking faculty.
- Improve their vocabulary and enable them to use the words appropriately in different academic and professional contexts.
- Aacquire skill in reading and understanding the different types of prescribed lesson units and inculcate some of their inherent features.
- Develop strategies that could be adopted while reading the text book.
- Read out the lessons to realize the role of word-order, choice of words, specific functions of structural words, understand the content and consequently acquire proficiency in skimming and rapid and silent reading.

SCHEME OF INSTRUCTION AND EXAMINATION

SUBJECT	INSTRUCTION		Examination			
	Hours/Week	Hours/Semester	Marks			Duration
			Internal Assessment	Board Examination	Total	
1001 - COMMUNICATION ENGLISH I	4 Hrs.	64 Hrs.	25	75	100	3 Hrs.

TOPICS AND ALLOCATION

PART	INSTRUCTION	TIME (Hrs.)
A.	Grammar (Non-Textual)	26
B.	Composition	16
C.	Prose (4 Units)	12
D.	Speaking Practice	6
E.	Revision and tests	4
	TOTAL	**64**

DETAILED SYLLABUS

PART A GRAMMAR (NON-TEXTUAL)

1. Functional Analysis
2. Parts of Speech
3. Voice (Active voice to Passive voice and Passive voice to Active voice)
4. Direct & Indirect speech (Direct to Indirect and Indirect to Direct)
5. Infinitives and Gerunds
6. Preposition
7. One-word substitute (Textual)
8. Question tag
9. Articles
10. Correction of Sentences
11. Prefixes
12. Suffixes (26 Hours)
13. Tenses

PART B COMPOSITION

(i) Comprehension
(Simple passages, relating to topics like environment, moral story, science and technology etc.)
(4 Hours)

(ii) Letter writing - Personal Letters
(Letter to your friend inviting him to your birthday party / Letter to your father asking him to permit you to join an education tour / Letter from a son/daughter to his/her father stating how he/she hopes to fare in the approaching Diploma Examinations / Letter to your friend offering your suggestions as to what to do after completing the Diploma Course)
(4 Hours)

(iii) Dialogue writing
(4 Hours)

(iv) Hints Development
(4 Hours)

PART C PROSE

Recommended Lesson units to be compiled in a Text Book form to be prescribed for the I Year students of the Diploma Course for the subject Communication English I. Four units are to be prescribed.

1. An Astrologer's Day – R.K.Narayan

2. The Sun, The Planets and the stars – C.Jones
3. The Continuing Spell of Ramanujan
4. On Saying 'Please' – A.G.Gardiner

(12 Hours)

PUBLISHERS:

Orient Longman, Anna Salai, Chennai-600002.

Internal Assesment :

Speaking Practice

Initially some kind of speaking practice in the I year will enable the students to effectively undergo the English Communication Practical course, which will be introduced in the III and IV semesters of the Diploma Course. Out of 25 marks meant for internal assessment, 10 marks are allotted to assess the spoken skills of the students and for assignments, 10 marks for periodical tests.

Speaking practice is intended to improve the skill of the students in oral expression. The practice of speaking in English should be encouraged in all possible ways.

The students must be given practice in the following areas :

- Listening practice
- Introducing oneself/others
- Expressions of courtesy
- Expressing agreement /disagreement

For giving speaking practice, the existing facilities and infrastructure in the English Communication Lab. can be effectively utilised.

(6 Hours)

- **REVISION AND TESTS**

(4 Hours)

REFERENCES:

A.S.Hornby, 'The Advanced Learners Dictionary of Current English', Oxford University Press. 1973

Wren & Martin, 'High School English Grammar and Composition', S.Chand & Co. Ltd., 2005

Glennis Pye, 'Vocabulary in Practice - Part 1 to 4', Cambridge University Press, 2004

Shiv K. Kumar & Hemalatha Nagarajan, 'Learn Correct English', Pearson Longman, 2005

Raymond Murphy, 'Essential English Grammar', Cambridge University Press, 1990

M.Thomas, 'Common Errors in English', Lotus Press, New Delhi, 2006

Michael Swan, 'Basic English Usage', ELBS/OUP, 1989

COMMUNICATION ENGLISH I
SEMESTER-I
Model Question Paper 1

Time : 3 Hrs. **Max. Marks : 75**

PART A - Grammar : 30 Marks

I 1. Answer the following questions as directed : **12 x 2 = 24**

a) Analyse the following sentence into functional units such as s/v/o etc.

It gave me a better glimpse.

b) Analyse the following sentence into parts of speech :

The girl wrote a letter to her cousin.

c) Change the voice in the following sentence.

I have sold my bicycle.

d) Change the following sentence into reported speech:

He said to me, “Will you listen to such a man?”

e) Change the infinitive in the following sentence into gerund, and rewrite the sentence.

Teach me to swim.

f) Rewrite the following sentences filling in the blanks with suitable propositions.

i) A true gentleman is courteous and affable _____ his neighbours.

ii) Newly acquired freedom is sometimes liable _____ abuse.

g) Give one-word substitutes for the underlined portions:

i) (text based) (ii) (text based)

h) Add question tags to the following and rewrite :

(i) It is raining. (ii) You aren't careful.

i) Rewrite the following sentences filling in the blanks with suitable articles :

(i) Copper is _____ useful metal. (ii) French is _____ easy language.

j) Correct the following sentences, and rewrite them after making necessary changes:

i) The quality of the mangoes were good.

ii) A gentleman has a dog to sell who wishes to go abroad.

k) Add suitable prefixes to form the negatives of the following words :

(i) (text based) (ii) (text based) (iii) (text based) (iv) (text based)

l) Add suitable suffixes to the following words so as to change their parts of speech :

(i) (text based) (ii) (text based) (iii) (text based) (iv) (text based)

2. Form 12 sentences in all the 12 tense forms using the following verb : **12 x ½ = 6**

learn

PART B - COMPOSITION : 20 Marks

II 1. Study carefully the following passage carefully and answer the questions given below it : **5**

Often students are very fond of reading books are labelled by their comrades as biblomaniacs. Those disparagements generally come from the mouths of students who consider themselves as being 'gamsters'. Boys who shine in athletics in the playing of some game, particularly cricket, consider that games field a better or nobler arena for their activities and the expenditure of their energies than the classroom or the reading desk. The idea is born out of an inferiority complex inherent in the games minded students who actually envy their fellows who shine academically. Academic honours have a glamour which is unique.

It is not to be denied that the playing of games is a worthy activity. It is worthy in the sense that the team spirit can be engendered in the individual only if he learnt to participate, in the playing of games. It is also true that the player does much for society and for his country on the playing field. It is time that the feeling of co-operation can be cultivated in a person only through group activitry. But studies should not be sacrificed in order that students devote their time only to the playing of games. It is my observation that those boys who become obsessed with playing particularly of cricket, begin to ignore their studies and then their academic ability suffers, as it must.

Let each type of activity have its own place in our daily round and then alone, will the balanced division of interest provide the individual with a proper perspective of things. Then will we have the student who is both academically good and who can hold his own on the games field. That is the personality that we want our educational system to produce.

Questions

1. What according to the author, is the main goal of education?
2. State the handicap arising out of our over involvement in games.
3. Why are academically sound students called bibliomaniacs?
4. What are the two qualities acquired through playing games?
5. What would you like to become bibliomaniacs or gamester?

2. Write a letter to your friend inviting him for a picnic that you have arranged. **5**

3. Complete the following dialogue, supplying suitable questions or responses as the case may be : **5**

(Ram and Rahim discuss their ambitions in life.)

Ram : .....

Rahim : My ambition in life is to become an engineer.

Ram : .....

Rahim : My father is a teacher.

Ram : Then, why do you want to become an engineer?

Rahim : .....

Ram : Do you have an idea of going abroad?

Rahim : .....

Ram : I appreciate your patriotism.

Rahim : .....

Ram : I think the burning problems of our country are illiteracy and economic disparity.

.

4. Develop the following hints into a passage of about 100 words with a suitable title. **5**

An old lady becomes blind - calls in a doctor - agrees to pay large fee if cured, but nothing if not - doctor calls daily - covets lady's furniture - delays the cure - every day takes away some of her furniture - at last cures her - demands his fees - lady refuses to pay, saying cure is not complete - doctor brings a court case - judge asks lady why she will not pay - she says sight not properly restored - she cannot see all her furniture - judge gives verdict in her favour - moral.

PART C – PROSE : 25 Marks

III 1. Write an essay on any one of the following in about 200 words **1 x 10 = 10**

a)

b)

2. Annotate any three of the following : **3 x 5 = 15**

a)

b)

c)

d)

COMMUNICATION ENGLISH I
SEMESTER-I
Model Question Paper 2

Time : 3 Hrs. **Max. Marks : 75**

PART A - Grammar : 30 Marks

I 1. Answer the following questions as directed : **12 x 2 = 24**

a) Analyse the following sentence into functional units such as s/v/c etc.

Other people may not share our opinion of our own work.

b) Analyse the following sentence into parts of speech :

Musicians shall be recognised as the torch-bearers of culture.

c) Change the voice in the following sentence.

The work will be finished by him in a fortnight.

d) Change the following sentence into direct speech:

He asked me if I would accompany him.

e) Change the infinitive in the following sentence into gerund, and rewrite the sentence.

To get a definition for the word 'democracy' is difficult.

f) Rewrite the following sentences filling in the blanks with suitable propositions.

i) He is sensible _____ your kindness.

ii) Don't associate _____ disreputable people.

g) Give one-word substitutes for the underlined portions:

i) (text based) (ii) (text based)

h) Add question tags to the following and rewrite :

(i) He will never give up. (ii) They have sold the house.

i) Rewrite the following sentences filling in the blanks with suitable articles :

(i) The children found _____ egg in the nest.

(ii) Yesterday _____ European called at my office

j) Correct the following sentences, and rewrite them after making necessary changes:

i) He described about the scenery.

ii) A nurse maid is wanted for a baby about twenty years old.

k) Add suitable prefixes to form the negatives of the following words :

(i) (text based) (ii) (text based) (iii) (text based) (iv) (text based)

l) Add suitable suffixes to the following words so as to change their parts of speech :

(i) (text based) (ii) (text based) (iii) (text based) (iv) (text based)

2. Form 12 sentences in all the 12 tense forms using the following verb : **12 x ½ = 6**

drive

PART B - COMPOSITION : 20 Marks

II 1. Study carefully the following passage carefully and answer the questions given below it : **5**

This romantic life in Kashmir was drawing to its end after three glorious months. Miss Joan was leaving a week earlier than Mrs.Rhodes, and about two days before she left I took her alone to the hotel for dinner. We walked to the hotel in perfect silence, a silence so heavy that I could hardly breathe. The hotel seemed to be far away and yet not far enough. That night, as I served her at table the temptation to touch her was overpowering, and I had almost forgotten myself when I dropped her coffee cup, which made me pull myself together and realize my position and my caste. On the way home there was a bridge over the canal to be crossed. She stopped on the bridge without a word, so I stopped beside her looking on to the calm water of the canal shining between the gigantic chenar trees. In the distance a gramophone was playing and the music floated over the water. We steed for a long time without saying a word to each other. I think the parting was disturbing her. There was something which she could not have explained and which she was trying to express. It might have been just a fancy of her own, or it may have been the subconscious knowledge of the secret, consuming passion of her attendant that was affecting her on this calm and beautiful night as we tarried on the bridge. It seemed to me that we stood there for ages, as if neither of us date break the magic spell of night and music. Our houseboat was only a few yards from the bridge, and the Goodnight was the only word that passed between us as we parted - everything then went into the darkness. The Mail lorry came up to the bridge to take her away from the romantic city of Srinagar - and away from me. After she had taken her seat I put a woollen rug over her knees to keep her warm on the journey, and she handed me a ten-rupee note as a parting gift and sweetly said Good-bye. I watched her wave her hand till the lorry was out of sight. Then I realized what I had lost, and lost for ever.

Questions

1. What was the matter with the attendant as he walked with Miss Joan to the hotel? Why did they not talk to each other?
2. After reading the passage can you give reasons to show what caste the attendant belonged to?
3. The author mentions the chenar trees of Kashmir. Give a brief but graphic description of these trees.
4. “I think the parting was disturbing her.” Was it the romantic atmosphere of the surroundings, they thought of having to leave Kashmir, the kindness of her attendant, or thoughts of home that were the cause of the disturbance?
5. Why does the author call Srinagar a romantic city? Give the meaning of “romantic.” Show how it may apply to Srinagar.

2. Write a letter to your younger brother, scolding him for having neglected his studies. **5**

3. Complete the following dialogue, supplying suitable questions or responses as the case may be : **5**

(The Principal of a Polytechnic College and one of his students)

Student : .....

Principal : Good Morning, my dear boy! What can I do for you?

Student : .....

Principal : No, you cannot get hostel accommodation right now. You will have to wait.

Student : .....

Principal : There is no accommodation available now. The hostel is full.

Student : .....

Principal : May be a fortnight from now on ..... my dear boy. I know you are coming from a distant place. One student is getting out in a fortnight from the Hostel.

Student : .....

4. Develop the following hints into a passage of about 100 words with a suitable title. **5**

A miser loses a purse of a hundred pieces of gold - in great distress - goes to town crier - crier says he must offer a reward - offers reward of ten pieces of gold - the crier announces this - a few days later a farmer comes to the miser - he has picked up the purse - returns it to miser - miser counts the money - a hundred pieces of gold - thanks the farmer - the farmer asks for the reward - miser says there were a hundred and ten pieces in the purse, so the farmer has already taken his reward of ten pieces - they quarrel - farmer appeals to the judge - the judge hears the case, and asks for the purse - sees that it only just holds a hundred pieces - decides it cannot be the miser's purse - so gives the purse to farmer - the miser had overreached himself.

PART C – PROSE : 25 Marks

III 1. Write an essay on any one of the following in about 200 words **1 x 10 = 10**

a)

b)

2. Annotate any three of the following : **3 x 5 = 15**

a)

b)

c)

d)

1002 – MATHEMATICS

SEMESTER-I

Objectives:

- At the end of the training programme, the student will be able to explain the basics of determinants and matrices and to solve linear equations in engineering oriented problems.
- Acquire basic knowledge in binomial to find the approximations of infinite expansions both algebraically and numerically.
- Explain the concept of complex numbers, De-moivre's theorem and its application to solve equation.
- Explain the concepts of straight lines, circles and family of circles.
- State the trigonometric formulae and apply the same in differential and integral calculus.
- Highlight the concept of limits and differentiation.

SCHEME OF INSTRUCTION AND EXAMINATIONS

Subject	Instruction		Examination			
			Marks			Duration
	Hours / Week	Hours / Semester	Internal Assessment	End Examination	Total	
1002 - Mathematics	7 Hrs.	112 Hrs.	25	75	100	3 Hrs.

TOPICS AND ALLOCATION

Sl.No	Topic	Time (Hrs)
1.	**Algebra**	20
2.	**Complex Number**	20
3.	Analytical Geometry	20
4.	**Trigonometry**	20
5.	**Differential calculus**	20
Tutorial		12
Total		112

DETAILED SYLLABUS

Unit-I

1. Algebra

1.1 Determinants:

Expansion of determinants upto third order only – problems involving properties of determinants – solution of simultaneous equations using Cramer's rule **[6 Hours]**

1.2 Matrices:

Introduction – Definition – Types of matrices – Operations on matrices – Inverse of a matrix upto 3 X 3 only – Solution of simultaneous equation using matrix inverses. **[7 Hours]**

1.3 Binomial Theorem:

Introduction to permutation and combination – Definitions – Values of npr and nc_r (results only) [not for examination] **[7 Hours]**

Binomial theorem for a positive integral index (statement only) – (Finding general term, middle term, coefficient of x^k and term independent of x). Binomial theorem for rational index (statement only) – Expansion only for negative integers upto – 3.

Unit-II

2. Complex Numbers:

2.1 **[8 Hours]**

Definition, real and imaginary parts, conjugates, modulus and amplitude form, multiplication and division of complex numbers (Geometrical proof not necessary).

Argand Diagrams – Collinear points, four points forming square, rectangle, rhombus and parallelogram only. Simple problems

2.2 Demoivre's theorem (statement only) - related problems. **[6 Hours]**

2.3 Finding the n^{th} roots of unity **[6 Hours]**

Solving equations of the form $x^n \pm 1 = 0$ ($n \leq 7$)

Unit-III

3. Analytical Geometry

3.1 Pair of straight lines: **[7 Hours]**

Pair of lines passing through origin– $ax^2 + 2hy + by^2 = 0$, expressed in the form $(y - m_1 x)(y - m_2 x) = 0$. Derivation of $\tan\theta = \pm 2\frac{\sqrt{h^2 - ab}}{a + b}$

Condition for the lines to be coincident and perpendicular – related problems.

General equation of the second-degree $ax^2 + 2hxy + by^2 + 2gx + 2fy + c = 0$, to represent pair of straight lines. Condition for second degree equation to represent pair of lines.

Condition $\begin{vmatrix} a & h & g \\ h & b & f \\ g & f & c \end{vmatrix} = 0$ (Statement only).

Problems related to the above result.

3.2 Circles: Equation of circle – Given centre and radius – General equation of circle – Finding centre and radius, equation of circles through three non-collinear points, equation of circle described on the line joining the points (x_1, y_1) and (x_2, y_2) as diameter (results only) – simple problems **[7 Hours]**

3.3 Family of Circles: Length of tangent and equation of tangent (result only). Concentric circles, contact of circles, orthogonal circles – Condition for orthogonal circles (result only). Simple problems. **[6 Hours]**

Unit-IV

4. Trigonometry

4.1 Compound Angles: Expansion of sin(A±B), cos(A±B) and tan(A±B) [without proof] problems involving the above expansions. **[6 Hours]**

4.2 Multiple Angles: Trigonometrical ratios of multiple angles (2A and 3A only) and sub-multiple angles – Simple problems. **[6 Hours]**

4.3 Sum and Product formulae: Simple problems using sum and product formulae. Identities – simple problems. **[8 Hours]**

Unit-V

5. Differential Calculus

5.1 Limits: **[6 Hours]**

Standard results $\lim_{x \to a} it \ \frac{x^n - a^n}{x - a} = n a^{n-1}$, $\lim_{\theta \to 0} it \ \frac{\sin\theta}{\theta} = 1$

(θ in radians) (without proof) – problems using the above results.

Differentiation: Definition – Differentiation of x^n, sin x, cos x, tan x, cot x, sec x, cosec x, log x, e^x, u $\pm$ v, kv + c, uv, uvw, u/v (results only). Problems using the above results

5.2 Differentiation methods: Differentiation of function of functions – Inverse trigonometric functions – Implicit functions. **[7 Hours]**

5.3 Successive differentiation: Successive differentiation and formation of differential equations up to second order only. **[7 Hours]**

Reference Book:

(1) Higher Secondary – First Year – Tamil Nadu Text Book Cooperation
(2) Engineering Mathematics – Dr.M.K.Venkatraman, National Publishing Co, Chennai.
(3) Engineering Mathematics – Dr. P. Kandasamy & Others, Schand & Co Ltd., New Delhi.

MODEL QUESTION PAPER - I

MATHEMATICS

Time: 3 hours Max. Marks: 75

PART – A

I. Answer all questions **(5 X 1 = 5)**

1. Find the general term of $\left(x^2 - \frac{2}{x}\right)^9$.
2. State Demoivre's theorem for positive integral index.
3. Write down the condition for two circles to cut each other orthogonally.
4. Simplify: $\frac{1-\tan^2 15^\circ}{1+\tan^2 15^\circ}$
5. Evaluate: $\underset{\theta \to 0}{Lt} \frac{\sin 6\theta}{\theta}$.

PART – B

II. Answer any TEN questions **(10 X 2 = 20)**

1. Prove that $\begin{vmatrix} 2a+b & a & b \\ 2b+c & b & c \\ 2c+a & c & a \end{vmatrix} = 0$
2. If $A = \begin{bmatrix} 1 & 8 \\ 4 & 3 \end{bmatrix}$, $B = \begin{bmatrix} 1 & 3 \\ 7 & 4 \end{bmatrix}$ find AB.
3. Find the first three terms in the expansion of $(1-x^2)^{-3}$ when $|x| < 1$
4. Prove that the complex numbers $1+3i, 5+i, 3+2i$ are collinear.
5. Simplify: $\frac{\cos 5\theta - i\sin 5\theta}{\cos 3\theta + i\sin 3\theta}$
6. Find all the values of cube root of unity.
7. Find the angle between the pair of lines $x^2 - 4xy - 5y^2 = 0$.
8. Find the equation of the circle described on the line joining the points (4, 1) and (–2, 7) as diameter.
9. Find the length of the tangent from the point (1, –2) to the circle $x^2 + y^2 + 4x - 5y + 1 = 0$.
10. Without using tables find the value of $\sin 40^\circ \cos 20^\circ + \cos 40^\circ \sin 20^\circ$.
11. If $\sin\theta = \frac{3}{5}$, find the value of Sin 3θ.
12. Prove that $\cos 80^\circ + \cos 40^\circ - \cos 20^\circ = 0$.
13. Find $\frac{dy}{dx}$ if $y = \frac{3x+2}{5x-7}$.
14. Find $\frac{dy}{dx}$ if $y = \tan(4x+5)$.
15. Form the differential equation, eliminating the constant 'a' from the equation $x^2 + y^2 = a^2$.

PART – C

NB: 1) Answer all questions choosing any two subdivisions from each question.

2) All questions carry equal marks. (10 X 5 = 50)

III a. Solve the equation by using Cramer's rule: 3x – y + 2z = 8; x + y – z = 2; 2x + y – z = –1.

b. Find the inverse of the matrix $\begin{bmatrix} 3 & 4 & 1 \\ 0 & -1 & 2 \\ 5 & -2 & 6 \end{bmatrix}$.

c. Find the term independent of x in the expansion of $\left(2x^2 - \frac{1}{x}\right)^{12}$.

IV. a. Prove that the points represented by the complex numbers –1, 3i, 3 + 2i, 2 – i form a square.

b. Using Demoivre's theorem simplify: $\frac{(\text{Cos}3\theta - i\,\text{Sin}3\theta)^5(\text{Cos}2\theta - i\,\text{Sin}2\theta)^{-4}}{(\text{Cos}4\theta + i\,\text{Sin}4\theta)^2(\text{Cos}3\theta + i\,\text{Sin}3\theta)^{-5}}$.

c. Solve: $x^6 - 1 = 0$.

V. a. Show that the equation $3x^2 + 7xy + 2y^2 + 5x + 5y + 2 = 0$ represents a pair of straight lines.

b. Find the equation of the circle passing through the points (6, 0) and (–1, –1) and having its centre on x + 2y + 5 = 0.

c. Show that the point (4, 1) lies on the circle $x^2 + y^2 - 2x + 6y - 15 = 0$. Find the equation of the tangent at the point diametrically opposite to (4, 1).

VI. a. If $\tan A = \frac{n}{n+1}$ and $\tan B = \frac{1}{2n+1}$ prove that $A + B = \frac{\pi}{4}$.

b. Prove that $\text{Sin}20^\circ\,\text{Sin}40^\circ\,\text{Sin}80^\circ = \frac{\sqrt{3}}{8}$.

c. If $A + B + C = 180^\circ$, prove that Cos 2A + Cos 2B – Cos 2C = 1 – 4 Sin A Sin B Cos C.

VII. a. Find $\frac{dy}{dx}$ of the following:

(i) $y = (3x^2 - 5x + 4)e^x\,\text{Cosec}\,x$ (ii) $y = \frac{1 + \tan x}{x - \text{Sin}\,x}$

b. Find $\frac{dy}{dx}$ of the following:

(i) $y = \tan^{-1}\left(\frac{2x}{1 - x^2}\right)$ (ii) $x^3 + y^3 = 3axy$

c. If $y = a\,\text{Cos}(\log x) + b\,\text{Sin}(\log x)$ prove that $x^2 y_2 + x y_1 + y = 0$.

MODEL QUESTION PAPER - II

MATHEMATICS

Time: 3 hours Max. Marks: 75

PART – A

I. Answer all questions **(5 X 1 = 5)**

1. State the condition for multiplication of two matrices.
2. If ω is the cube root of unity what is the value of $1+\omega+\omega^2$.
3. When the pair of lines given by the equation $ax^2 + 2bxy + by^2 + 2gx + 2fy + c = 0$ will be parallel?
4. Simplify: $\dfrac{\tan 25^\circ + \tan 20^\circ}{1 - \tan 25^\circ \tan 20^\circ}$
5. Find $\dfrac{d}{dx}(\tan^{-1} x)$

PART – B

II. Answer any TEN questions **(10 X 2 = 20)**

1. Find x if $\begin{vmatrix} 1 & 2 & 3 \\ 5 & -1 & -2 \\ 2 & x & 6 \end{vmatrix} = 0$
2. Find the inverse of the matrix $\begin{bmatrix} 2 & -1 \\ 3 & 1 \end{bmatrix}$
3. Find the 5th term in the expansion of $\left(2x^2 - \dfrac{3}{x}\right)^{11}$
4. Find the real and imaginary parts of $\dfrac{3}{5+4i}$.
5. If $x = \cos\theta + i\sin\theta$, find $x^m + \dfrac{1}{x^m}$.
6. Find all the values of $(-1)^{\frac{1}{3}}$.
7. Find the combined equation of the pair of lines given by $3x + 2y = 0$ and $x - y + 3 = 0$.
8. Find the centre and radius of the circle $x^2 + y^2 + 8x + 10y - 8 = 0$.
9. Prove that the circles $x^2 + y^2 + 4x + 2y - 5 = 0$ and $x^2 + y^2 + 6x - 10y + 7 = 0$ cut orthogonally.
10. If $\tan A = \dfrac{1}{2}$ and $\tan B = \dfrac{1}{3}$ find tan (A + B).
11. Prove that $\dfrac{\sin 2A}{1 + \cos 2A} = \tan A$
12. Prove that $\dfrac{\sin 2A - \sin 2B}{\cos 2A + \cos 2B} = \tan(A - B)$.
13. Find $\dfrac{dy}{dx}$ if $y = (1 + x^2)\tan x$
14. Find $\dfrac{dy}{dx}$ if $x \tan y = c$.

15. Find $\frac{d^2y}{dx^2}$ if $y = \log(\sin x)$

PART – C

NB: 1) Answer all questions choosing any two subdivisions from each question.

2) All questions carry equal marks. **(10 X 5 = 50)**

III. a. Show that $\begin{vmatrix} 1+x & 1 & 1 \\ 1 & 1+x & 1 \\ 1 & 1 & 1+x \end{vmatrix} = x^2(x+3)$

b. If $A = \begin{bmatrix} 3 & -5 \\ -4 & 2 \end{bmatrix}$ show that $A^2 - 5A - 14I = O$,where I is the unit matrix and O is the null matrix of order 2

c. Find the coefficient of x^{-5} in the expansion of $\left(x - \frac{3}{5x^2}\right)^7$

IV. a. Find the modulus and amplitude of $\frac{1+3\sqrt{3}i}{\sqrt{3}+2i}$.

b. If $a = Cosx + iSinx$ and $b = Cos\,y + iSin\,y$ prove that $ab + \frac{1}{ab} = 2Cos(x+y)$

and $\sqrt{\frac{a}{b}} - \sqrt{\frac{b}{a}} = 2iSin\left(\frac{x-y}{2}\right)$

c. Solve: $x^8 - x^5 + x^3 - 1 = 0$

V. a. If the slope of one of the straight lines $ax^2 + 2hxy + by^2 = 0$ is twice that of the other, show that $8h^2 = 9ab$

b. Find the equation of the circle passing through the point (8,7)and having centre at (2,-1)

c. Show that the circles $x^2 + y^2 - 4x - 4y - 37 = 0$ and $x^2 + y^2 + 6x + y + 8 = 0$ touch other

VI. a. If $A + B = 45^\circ$ show that $(1 + \tan A)(1 + \tan B) = 2$ and hence find the value of $\tan 22½^\circ$

b. Show that $\frac{1 - Cos2A + Sin2A}{1 + Cos2A + Sin2A} = \tan A$

c. If $a = \sin\alpha + \sin\beta$ and $b = \cos\alpha + \cos\beta$,prove that $\tan^2\left(\frac{\alpha-\beta}{2}\right) = \frac{4 - a^2 - b^2}{a^2 + b^2}$

VII. a. Differentiate the following with respect to x

i) $\frac{3}{x^4} + \frac{5}{x^3} - \frac{1}{x^2} + \frac{3}{\tan x} + \frac{1}{5}$ ii) $\frac{1+\sin x}{1-\sin x}$

b. Differentiate the following with respect to x

i) $e^{5x}\sin^3 x$ ii) $\cos^{-1}\left(\frac{1-x^2}{1+x^2}\right)$

c. Find the differential equation by eliminating the constants A and B from $y = A\cos 5x + B\sin 5x$

1003: ENGINEERING PHYSICS I
SEMESTER-I

OBJECTIVES

- At the end of the Training Programme the student will be able to acquire basic knowledge of SI units both fundamental and derived.
- To state the basic laws of forces acting at a point and on rigid bodies and mention its applications
- Explain viscous force and surface tension
- Get a through understanding of productile and circular motion and mention its application
- Explain the concepts satellites and remote sensing
- To acquire knowledge about various types of sound waves
- To solve simple problems connected with the course of study

SCHEME OF INSTRUCTION AND EXAMINATIONS

Subject	Instruction		Examination			
	Hours/week	Hours/Semester	Marks			Duration
			Internal Assessment	Board Examination	Total	
1003 Engineering Physics	3Hrs	48 Hrs	25	75	100	3 Hrs

TOPICS AND ALLOCATION

SL.No	Topic	Time (Hrs)
Unit 1	S.I. Units and Statics	10
Unit 2	Properties of Matter	10
Unit 3	Dynamics	12
Unit 4	Rotational Motion and Satellites	7
Unit 5	Remote Sensing and Sound	9
	Total	**48**

ENGINERRING PHYSICS- I

UNIT – 1

S.I UNITS, STATICS

1.1 S.I Units:

Fundamental quantities: Length, Mass, Time.

Derived quantities: Area, Volume, Velocity, Acceleration, Momentum, Force, Impulse, Power and Energy. S I Units of Base and Supplementary units-conventions- multiples and sub-multiples of units Dimensional formula

(2hrs)

1.2 Statics:

Concurrent forces: Definitions of Scalar and Vector-examples. Resolution of a vector into two rectangular components- Parallelogram law of forces-Statement- Derivation of expressions for magnitude and direction of resultant of two forces at a point with an acute angle between them- Lami's theorem- Statement –Experimental verification of Parallelogram law of forces and Lami's theorem

(Direct and Simple Problems may be asked)

(8hrs)

Unit- 2

PROPERTIES OF MATTER

2.1 Properties of Matter:

Elasticity: Definitions- stress and strain- Statement of Hooke's law-Definitions of Young's modulus, Bulk modulus and Rigidity modulus- Experimental verification of Young's modulus by uniform bending - Torsion pendulum - Experiment to find the Moment of Inertia of the disc and Rigidity modulus of the wire by using symmetrical masses.

Viscosity: Definition of Stream line and turbulent motions- Definition of co-efficient of viscosity- Experimental comparison of viscosities of two liquids - Definition of Terminal velocity- Experiment to determine the coefficient of viscosity by Stoke's method.

Surface tension: Definitions of surface tension and angle of contact- Derivation of the formula for surface tension of liquid by Capillary rise method- Experiment to determine surface tension of water.

(Direct and Simple Problems may be asked)

(10hrs)

Unit -3

DYNAMICS

3.1 Projectile Motion:

Definition of a projectile motion- Definitions of Angle of projection, trajectory, time of flight and range- Expressions for maximum height, maximum range and time of flight- Derivation of the equation to show that the path of the projectile is a parabola.

(4hrs)

3.2 Circular Motion:

Definition of a Circular motion and Angular velocity- Relation between linear velocity and angular velocity- Definition of Normal acceleration- Derivation of normal acceleration- Definition of Centripetal force- Derivation of Centripetal force- Definition of Centrifugal force.

(6hrs)

3.3 Application of Circular Motion:

Banking of Curved tracks- Definition of Angle of banking- Expression for the angle of banking of a railway track ($\tan\theta = v^2/rg$)

(Direct and simple problems may be asked)

(2hrs)

Unit - 4

4.1 Rotational Motion of Rigidity Bodies:

Definition of Moment of inertia of a Particle and a Rigid body- Definition of Radius of Gyration- Derivation of Kinetic energy of a rigid body rotating about an axis- Definition of Angular momentum- Derivation of expression for angular momentum- Law of Conservation of angular momentum .

(4hrs)

4.2 Satellite:

Kepler's laws- Definitions for Escape velocity and Orbital velocity- Expression for Escape velocity-Expression for orbital velocity.

(Direct and simple problems may be asked)

(3hrs)

Unit - 5

5.1 Remote sensing:

Introduction- Active and Passive remote sensing- Components of remotes sensing- Data acquisition, Data analysis, Reference data- Electro Magnetic spectrum- Microwave remote sensing- Radar- Indian remote sensing satellite.

(4hrs)

5.2 Sound:

Definitions of longitudinal waves, transverse waves, Progressive waves, Stationary waves, Wave length-Frequency and Velocity- Laws of vibration in stretched strings- Resonance - Sonometer – Experiment to determine the frequency of a tuning Fork. Acoustics of buildings: Reverberation- Reverberation time- Echo- Coefficient of absorption of sound energy.

(Direct and simple problems may be asked)

(5hrs)

Total 48-hrs

Reference Book:

1. Resnick and Hoilday - Physics – Wisley Toppan Publishers – England
2. Narayana Kurup – Mechanics - S. Chand Publishers – New Delhi
3. B.L. Theraja – Engineering Physics – S. Chand Publishers – New Delhi
4. Dr.M.Anji Reddy – Remote sensing – Jawaharlal Nehru Technological University – Hydrabad.

1003 Engineering physics I
SEMESTER-I

Model Question paper 1

Time: 3hrs **Max mark 75**

Part A

Marks 5x1=5

I Answer all question

1. What is the dimensional formula for force?
2. Why rain drops fall slowly?
3. What is the force acting on moon, when it revolves around the earth?
4. Give the value of escape velocity for a particle on earth.
5. What is RADAR?

Part B

Marks 10x2 =20

II. Answer any ten questions.

All questions carry equal marks.

1. Give two examples for supplementary units
2. Define equilibrant of forces.
3. State Lami's theorem.
4. State Hooke's law.
5. Define terminal velocity
6. Define Young's modulus
7. Define Time of flight.
8. What is centrifugal force?
9. What is normal acceleration?
10. Define radius of gyration.
11. Define angular momentum.
12. Define orbital velocity.
13. What is active remote sensing?
14. What is transverse wave?
15. What is reverberation?

Part -C

Marks 10x5=50

Answer all questions, choosing any two sub-divisions from each question.

All questions carry equal marks.

III a. State the conventions to be followed in S.I units

b. Describe how Lami's theorem is verified in the laboratory.

c. If the resultant of two forces 6N and 8N is 12N, find the angle between the two forces.

IV a. Describe an experiment to determine the rigidity modulus of a wire using torsion pendulum.

b. Describe an experiment to find out the coefficient of viscosity of a highly viscous liquid.

c. The length of a wire increases from 1.25m to 1.2508m when a weight of 12kg is suspended. The radius of the wire is 0.5mm. Find the stress, strain and young's modulus of the wire.

V a. Derive an expression for maximum height of a projectile.

b. Derive an expression for centrifugal force.

c. The range of a projectile is equal to double the maximum height attained. Find the angle of projection.

VI a. Derive an expression for the kinetic energy of a rigid body rotating about an axis.

b. Derive an expression for escape velocity.

c. Calculate the escape velocity for a particle 1000 km above the surface of the earth. Radius of the earth is 6.4×10^6.

VII a. Explain microwave remote sensing.

b. Describe an experiment to determine the frequency of the tuning fork using sonometer.

c. The density of a sonometer wire of radius 0.3mm is $7800 kgm^{-3}$. Find its linear density.

1003 Engineering physics I

SEMESTER-I

Model Question paper 2

Time: 3hrs **Max mark 75**

Part A

Marks 5x1=5

I Answer all question

1. Give the S.I unit of impulse.
2. The droplet of rain is spherical. Why?
3. What is the condition for maximum range of a projectile?
4. Give the formula for moment of Inertia of a rigid body.
5. Can sound waves propagate in vacuum?

Part B

Marks 10x2 =20

II. Answer any ten questions.

All questions carry equal marks.

1. State any two conventions to be followed in writing S.I units.
2. Define resultant of forces.
3. State Parallelogram law of forces.
4. Define coefficient of viscosity of a liquid.
5. Define angle of contact.
6. Define rigidity modulus.
7. Define maximum height of a projectile.
8. Define angular velocity.
9. Define centrifugal force.
10. State the law of conservation of angular momentum.
11. Define moment of inertia of a rigid body.
12. Define escape velocity.
13. What is passive remote sensing?
14. Define wave length.
15. Define coefficient of absorption of sound energy.

Part C

Marks 10x5=50

Answer all questions, choosing any two sub-divisions from each question.

All questions carry equal marks.

III a. Derive expressions for the magnitude and direction of the resultant of two forces.

b. Describe an experiment to verify parallelogram law of forces.

c. A body of mass 5kg is suspended by two light and inextensible strings of length 3m and 4m from two points on a horizontal line 5m apart. Find the tensions in the strings.

IV a. Derive an expression for surface tension of a liquid by capillary rise method.

b. Describe an experiment to determine the young's modulus of a material of a beam by uniform bending

c. A capillary tube of internal diameter 0.4mm is dipped in water. If water rises to a height of 5.4cm calculate the value of surface tension of water.

V a. Prove that the path of the projectile is a parabola.

b. Derive an expression for normal acceleration.

c. Derive an expression for angle of banking.

VI a. Derive an expression for angular momentum of a rotating rigid body.

b. Derive an expression for orbital velocity.

c. An aero plane with a speed of 120m/s negotiates a curve of radius 1200m. Calculate its angle of banking.

VII a. Describe the components of remote sensing.

b. Write short notes on acoustics.

c. Find the frequency of sound produced by a string 25cm long stretched by load of 5kg, and the linear density of the wire is 4.9×10^{-3} kgm^{-1}.

1004 - ENGINEERING CHEMISTRY-1
SEMESTER-I

OBJECTIVES:

- At the end of the Training Programme, the student will be able to state the importance of Engineering Chemistry in Industry
- Realise importance of pH factor in all industries and to get ideas about its applications in Industries
- Impart basic knowledge of Chemistry in Catalyst and its applications in Industries
- Acquire through knowledge about environmental pollution and control
- Explain corrosion and its control
- Differentiate various types of batteries and their applications
- Acquire knowledge about lubricants, adhesives, colloids and ceramics

SCHEME OF INSTRUCTIONS AND EXAMINATIONS

Subject	Instructions		Examination			
	Hours/week	Hours/Semester	Internal assessment	Board Examination	Total	Duration
1004Engineering Chemistry-I	3 Hours	48 Hours	25	75	100	3 Hrs

TOPICS AND ALLOCATION

Sl. No.	Topics	Time (Hours)
Unit-1	Acids, Bases, Catalysts	8 Hours
Unit-2	Environmental Chemistry	8 Hours
Unit-3	Electro-Chemistry, Corrosion	9 Hours
Unit-4	Organic Coatings, Adhesives, Lubricants	9 Hours
Unit-5	Colloids, Ceramics	8 Hours
	Revision and Examinations	6 Hours
	TOTAL	48 Hours

1004 - ENGINEERING CHEMISTRY-I

3 HOURS PER WEEK

UNIT- I

1. **Acids** - **Bases**-Theories of Acid and Bases - Lewis Theory-Advantage of Lewis Theory- P^H definition-problems-industrial applications-Buffer solution-definition-examples of acidic and basic buffer solution. **(4Hrs)**

2. Catalysis – Definition - Positive, negative catalyst-types-homogeneous & heterogeneous-promoters-catalyst poison-characteristic of catalyst-industrial applications. **(4Hrs)**

UNIT - II

1. POLLUTION - Definition - Air pollution - Air Pollutants (SO_2,H_2S,HF,NO_2,CO,Dust)harmful effects-Acid rain and its effects(basic ideas)-- other effects of air pollution-Green House effect-definition-Global warming-effects of global warming(basic ideas) –ozone layer-importance of-causes of depletion of ozone layer(no equations)-effects of ozone layer depletion(all basic ideas)-Control of air pollution.

Water pollution-causes - (sewage, effluents, algae ,micro organisms) - their harmful effects and control - Sewage -problems and disposal – Eutrophication -definition &harmful effects -Industrial effluents- harmful effects(including effects of metals like Lead, Cadmium, Zinc, copper) - treatment –Green chemistry-definition- Goals of green Chemistry (basic ideas only). **(8Hrs)**

UNIT-III

1.Electro chemistry - Types of conductors-metallic, semi and electrolytic- examples-difference between metallic & electrolytic conductor-electrolysis-mechanism of cathodic & anodic reactions-industrial applications of electrolysis-electro plating(chromium plating)-Battery-definition-types-primary-secondary-flow battery –(definition only. (No equations) **(5Hrs)**

2.Corrosion - Definition-electro chemical theory-formation of galvanic cells-concentration cells-methods of prevention of corrosion -1.alloying 2.surface coating :galvanization, electroplating, anodisation 3.cathodic protection: sacrificial anode, impressed voltage method**.** **(4Hrs)**

UNIT-IV

1.Organic coatings: paints -definition-components of paints &their functions – varnish -
Definition-types-preparation of oil varnish-difference between paint&varnish-
- special paints – Definitions of - luminescent, heat resistant, fire retardant, antifouling paint, cement paint ,aluminium paint &distemper . .
preliminary ideas about DYES -acid dyes-basic dyes - mordant dyes. –(definition only)
(No equations) **(4Hrs)**

2. Adhesives - Definition-requirements-classification- natural adhesives - (shellac, starch, asphalt)-synthetic adhesives-thermo plastic resin(PVC, cellulose nitrate) - thermoset plastic resin(phenol formaldehyde & urea formaldehyde). **(3Hrs)**

3. Lubricants - Definition-characteristics-types-. Solid (graphite, molybdenum sulphide), liquid(vegetable oils, animal fats, petroleum products),semi solid(grease) **(2Hrs)**

UNIT-V

1. Colloids - Definition-True solutions and colloidal solution - differences – Lyophilic – Lyophobic colloids – Differences – properties – Tyndall effect, Brownian movement, Electrophoresis, Coagulation-industrial applications-smoke precipitation- Cottrells method, purification of water, cleaning action of soap, tanning, sewage disposal. **(5Hrs)**

2. Ceramics – White Pottery – definition - manufacture of white pottery – uses – Glazing – definition – purpose – method - Salt glazing

(3Hrs)

REFERENCES:

1. Soni PL - Inorganic chemistry –SultanChand&sons.
2. Soni PL - Organic chemistry -Sultan Chand & sons.
3. Jain & Jain - Engineering chemistry - Dhanpat rai &co
4. Uppal - Engineering chemistry - Khanna publishers
5. Dara .SS - Environmental chemistry &Pollution control - S. Chand&co
6. Tripathy .SN - Environmental Plollution - Sunakar panda - Vrinda publication
7. Rain water Harvesting-hand book by Chennai Metro Water

1004 ENGINEERING CHEMISTRY –I
SEMESTER-I
MODEL QUESTION PAPER – I

Time: 3 hrs **Max. Marks : 75**

PART – A

I. Answer all Questions Only: **5 X 1 = 5**

1) Name the catalyst used is Haber's Process
2) Name any one air pollutant?
3) Which is used as electrolyte in chrome plating?
4) Give an example of Synthetic adhesive
5) Give an example for lyophobic colloid

PART – B

10 X 2 = 20

II. Answer any Ten Questions Only:

1) Define P^H?
2) What are Buffer solutions?
3) Define Catalysis
4) Define harmful effect of (i) SO_2 (ii) H_2S.
5) Mention any four water pollutants?
6) Define green chemistry.
7) Define anodisation.
8) What are semiconductors?
9) Define Electroplating.
10) Define Lubricant.
11) What are mordent dyes?
12) What are adhesives?
13) Define colloids.
14) What is electrophoresis?
15) Define white pottery.

PART – C

Answer any two divisions from each Questions : **10 X 5 = 50**
All Questions carry equal marks:

III. (a) Define P^H. H^+ ion concentration of a solution is 6.2×10^{-4}g ions per litre. Calculate P^H of the solution
(b) Explain Lewis theory of acids and bases
(c) Write notes on applications of catalyst.

IV. (a) What is sewage? What are its problems and how it is disposed?
(b) Define eutrophication and explain its harmful effects.
(c) Write short notes on goals of green chemistry.

V. (a) Explain electrolysis with example
(b) Define galvanization and explain any one method of galvanization
(c) Write a note on cathodic protection

VI. (a) Explain the properties of a good lubricant
(b) Write a note on natural adhesives
(c) What are the components of paints and write their functions?

VII. (a)Give properties of colloids...
(b) Explain the manufacture of white pottery
(c) Give difference between lyophilic and lyophobic colloids.

ENGINEERING CHEMISTRY –I

MODEL QUESTION PAPER –II

Time: 3 hrs **Max. Marks: 75**

PART – A

I. Answer all Questions Only: **5 X 1 = 5**

1) What is the P^H of pure water?
2) Give one bad effect of lead?
3) Give one example of semiconductor?
4) Give one example for natural adhesive?
5) Give one use of white pottery

PART - B

II. Answer any Ten Questions Only: **10 X 2 = 20**

1) What is acidic buffer solution and give one example?
2) What is the advantage of Lewis theory?
3) Define positive and negative catalyst?
4) What is the ozone layer depletion?
5) What is meant by acid rain?
6) What are the goals of green chemistry?
7) What are the types of conductors?
8) Which is called as sacrificial anode?
9) Define galvanization.
10) What are the difference between paint and varnish?
11) What are the advantages of starch?
12) What are the types of lubricants? Give example for each?
13) Define Brownian movement.
14) Define Tyndall effect.
15) Define ceramics.

PART – C

Answer any two divisions from each Questions : **10 X 5 = 50**
All Questions carry equal marks:

III. (a) Mention any five applications of P^H in industries?
(b) Classify the following into Lewis acids and Lewis bases.
i) $AlCl_3$ ii) NH_3 iii) Cl^- iv) Na^+ v) BF_3
(c) Explain the characteristics of catalyst?

IV. (a) Explain the problems of air pollution?
(b) Write briefly about the problems and treatment of effluents?
(c) Write a note on global warming.

V. (a) Explain electroplating with example?
(b) Give the difference between metallic conductors and electrolytic conductors?
(c) Explain the electrochemical theory of corrosion?

VI. (a) What are the ingredients of paint and their functions?
(b) Write a note on heat resistant, fire retardant and distemper?
(c) Write a note on synthetic adhesives?

VII. (a) Give differences between true&colloidal solution
(b) Write a note on Industrial applications of colloids?
(c) Write a note on glazing?

2001 COMMUNICATION ENGLISH II
SEMESTER-II

OBJECTIVES

- At the end of the Training Programme, the student will be able to acquire proficiency in the four major skills of communication viz. (i) reading (ii) listening (iii) writing and (iv) speaking towards successfully integrating all of the four skills for the effective use of English in communication, besides a source of inspiration for developing their aesthetic skills and thinking faculty.
- Improve their vocabulary and enable them to use the words appropriately in different academic and professional contexts.
- Acquire skill in reading and understanding the different types of prescribed lesson units and inculcate some of their inherent features.
- Develop strategies that could be adopted while reading the text book
- Read out the lessons to realize the role of word-order, choice of words, specific functions of structural words, understand the content and consequently acquire proficiency in skimming and rapid and silent reading.

SCHEME OF INSTRUCTION AND EXAMINATION

SUBJECT	INSTRUCTION		Examination			
	Hours/Week	Hours/Semester	Marks			Duration
1001 - COMMUNICATION ENGLISH II	4 Hrs.	64 Hrs.	Internal Assessment	Board Examination	Total	
			25	75	100	3 Hrs.

TOPICS AND ALLOCATION

PART	INSTRUCTION	TIME (Hrs.)
A.	Grammar (Non-Textual)	26
B.	Composition	16
C.	Prose (4 Units)	12
D.	Speaking Practice	6
E.	Revision and tests	4
	TOTAL	**64**

DETAILED SYLLABUS

PART A GRAMMAR (NON-TEXTUAL)

1. Transformation of sentences (Interrogative into assertive and Exclamatory into assertive)
2. Changing a sentence into negative without changing the meaning.
3. Removing 'Too…….to' and replacing it with 'so that …….not'
4. Removing 'as soon as' and replacing it with 'no sooner ..... than'
5. Degrees of Comparison
6. Simple, Compound and Complex sentences
   (Simple into complex and vice versa)

7. Simple, Compound and Complex sentences
   (Simple into compound and vice versa)
8. Rewriting a sentence with 'it' in the initial position
9. Rewriting a sentence with 'There' in the initial position
10. Answering the verbal questions in affirmative and negative
11. Rearranging the following words to form a meaningful sentence
12. Synonyms and Antonyms
13. Forming meaningful sentences for the words given. (Words to be selected from the enclosed list)

(26 Hours)

PART B COMPOSITION

(v) Conversion of Graphics (Pie-Chart, Bar-Chart, Table)

(4 Hours)

(vi) Letter writing - Business and Official letters
(Letter inviting quotations, Letter of quotation, Letter placing orders. Request for leave/Bonafide Certificate/Testimonials/Applying for a job with bio-data/Curriculum Vitae)

(4 Hours)

(vii) Report writing (Technical Reports)
(Market report, Investigation report, Field report)
(4 Hours)

(viii) Creative writing
(4 Hours)

PART C PROSE

Recommended Lesson units to be compiled in a Text Book form to be prescribed for the I Year students of the Diploma Course for the subject Communication English. Four units are to be prescribed.

1. Water: The Elixir of Life – Sir C.V.Raman
2. Dr.Visveswaraya – An Extract
3. A Beautiful Clock – Choodamani Raghavan
4. My Brother, My Brother - Norah Burke

(12 Hours)

PUBLISHERS:

Orient Longman, Anna Salai, Chennai-600002.

Internal Assesment :

Speaking Practice

Initially some kind of speaking practice in the I year will enable the students to effectively undergo the English Communication Practical course, which will be introduced in the III and IV semesters of the Diploma Course. Out of 25 marks meant for internal assessment, 10 marks are allotted to assess the spoken skills of the students and for assignments, 10 marks for periodical tests.

Speaking practice is intended to improve the skill of the students in oral expression. The practice of speaking in English should be encouraged in all possible ways.

The students must be given practice in the following areas :

- Listening practice
- Asking for / giving information
- Describing objects
- Describing situations
- Role play

For giving speaking practice, the existing facilities and infrastructure in the English Communication Lab. can be effectively utilised.
(6 Hours)

- **REVISION AND TESTS**

(4 Hours)

REFERENCES:

A.S.Hornby, 'The Advanced Learners Dictionary of Current English', Oxford University Press. 1973
Wren & Martin, 'High School English Grammar and Composition', S.Chand & Co. Ltd., 2005
Glennis Pye, 'Vocabulary in Practice - Part 1 to 4', Cambridge University Press, 2004
Shiv K. Kumar & Hemalatha Nagarajan, 'Learn Correct English', Pearson Longman 05
Raymond Murphy, 'Essential English Grammar', Cambridge University Press, 1990
M.Thomas, 'Common Errors in English', Lotus Press, New Delhi, 2006
Michael Swan, 'Basic English Usage', ELBS/OUP, 1989

LIST OF WORDS FOR ENRICHING VOCABULARY SKILLS

abandon	decay	giant	uxury	stink
accent	deceive	goggles	measure	strike
accept	defend	gossip	mischief	tackle
accurate	defuse	grip	monument	talent
addict	delegate	guard	naive	tame
admiration	delicate	harvest	native	tease
adore	delicious	hate	neighbour	terminate
advent	delight	heal	noisy	trace
affirm	denote	hermit	nomad	trap
agitation	depression	hire	obtain	tremble
agony	dignitary	impart	obvious	turmoil
apologise	dish	imply	opportunity	undergo
aroma	document	import	organisation	undo
bankrupt	dynamic	imprison	original	uniform
bargain	echo	infant	ornament	union
beast	ecstasy	inherit	pang	unique
benefit	edifice	injure	parade	unity
biography	efficiency	insert	perfume	universal
boast	elevator	inspect	pilgrim	vacate
brief	elicit	instal	privilege	vague
brilliant	elite	intend	profound	valuable
brute	emblem	interfere	prolong	value
capture	emerge	interview	punctual	vanish
carve	energy	invent	purchase	vapour
cease	enforce	issue	qualification	vary
circulate	evade	jealous	quarrel	vault
claim	exclaim	jester	queue	venture
clarify	expand	jewel	quit	wade
client	expel	journal	quotation	wasp
clog	ferocious	journey	radiant	weary
collide	fervour	junction	rapid	weigh
commit	flaw	jungle	rapture	whip
compile	flee	junk	reception	whisker
comply	flourish	justice	rent	withhold
comrade	freeze	kennel	repair	wound
consumer	gain	kerchief	repay	wrinkle
contagious	gamble	kid	repent	yard
contribute	gang	knot	scoop	yarn
cordial	garland	labour	shiver	yawn
cosmos	garment	launch	shrink	youth
costume	gem	liberty	shun	zeal
crew	generous	lock	sneeze	zenith
damp	germ	logic	steal	zest
dawn	ghost	loot	Sting	

COMMUNICATION ENGLISH II

SEMESTER-II

Model Question Paper 1

Time : 3 Hrs. **Max. Marks : 75**

PART A - Grammar : 30 Marks

I 1. Answer the following questions as directed : **12 x 2 = 24**

a) Change the following interrogative sentence into an assertive sentence.

When can their glory fade?

b) Change the following affirmative sentence into a negative one without changing the meaning:

I was doubtful whether it was you.

c) Rewrite the following sentence replacing 'too……..to' with 'so……that'.

He was too late to bear the first speech.

d) Rewrite the following sentence replacing 'as soon as' with 'no sooner……than'.

As soon as he heard the news, he wrote to me.

e) Change the following into a sentence of comparative degree.

No other story book is so popular as 'the Arabian Nights'.

f) Change the following complex sentence into a simple sentence.

We hope that better times will come.

g) Change the following simple sentence into a compound sentence.

He must work hard to win the first prize.

h) Rewrite the following sentence with 'it' at the initial position.

To get through an examination without preparation is difficult.

i) Rewrite the following sentence with 'there' at the initial position.

Five students are reading in the library.

j) Answer the following verbal questions first (a)in the affirmative and then (b)in the negative.

Do you like sweets?

k) Choose the antonyms of the italicized words from the options given :

(i) (text based)

(ii) "

l) Rearrange the following words to form a meaningful sentence.

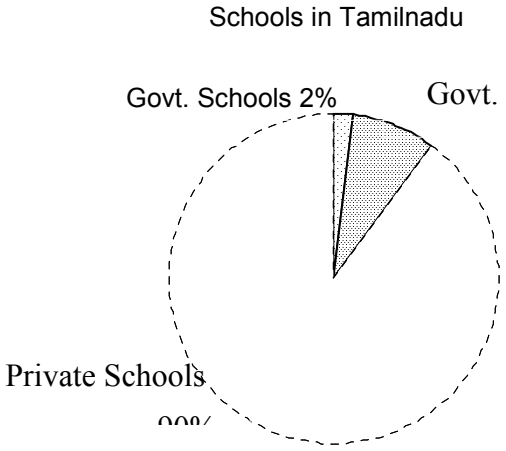
coffee, drank, in the morning, he

2. Write three sentences using each of the following words. **3 x 2 = 6**

(i) apologise (ii) labour (iii) delicious

PART B - COMPOSITION : 20 Marks

II 1. Study carefully the following graphic and present the message in a present the message in a paragraph of about 100 words. **5**



2. Write a letter to TT Computers, Chennai placing order for 30 personal computers as from the Manager of ABC agencies, Tirunelveli. **5**

3. Write a Survey Report as from the Marketing Manager who heads a three member Committee with a note of dissent, if any, on the market potentialities for the introduction of a new product of your Company. **5**

4. Bring out in a write-up of about 100 words, your feelings on the sense of irresponsibility you might have observed in some of the people when you walk on the road, see a movie in a theatre and spend your time on a beach. **5**

PART C – PROSE : 25 Marks

III 1. Write an essay on any one of the following in about 200 words **1 x 10 = 10**

a)

b)

2. Annotate any three of the following : **3 x 5 = 15**

a)

b)

c)

d)

COMMUNICATION ENGLISH II

SEMESTER-II

Model Question Paper 2

Time : 3 Hrs. **Max. Marks : 75**

PART A - Grammar : 30 Marks

I 1. Answer the following questions as directed : **12 x 2 = 24**

a) Change the following exclamatory sentence into an assertive sentence.

What a wonderful creature an elephant is!

b) Change the following affirmative sentence into a negative one without changing the meaning:

I always love my country.

c) Rewrite the following sentence suitably replacing 'too……..to' with 'so……that'.

This fact is too evident to require proof.

d) Rewrite the following sentence suitably replacing 'as soon as' with 'no sooner……than'.

As soon as he got the telegram, he left in a taxi.

e) Change the following into a sentence of superlative degree.

No other democracy in the world is as large as India.

f) Change the following simple sentence into a complex sentence.

Our friends will bear of our success.

g) Change the following compound sentence into a simple sentence.

He is very poor, but he does not complain.

h) Rewrite the following sentence with 'it' at the initial position.

Taking more than your fair share of food is selfish.

i) Rewrite the following sentence with 'there' at the initial position.

Many rare animals are kept in this zoo.

j) Answer the following verbal questions first (a)in the affirmative and then (b)in the negative:

Did you go to college yesterday?

k) Choose the antonyms of the italicized words from the options given :

(i) (text based)

(ii) "

l) Rearrange the following words to form a meaningful sentence.

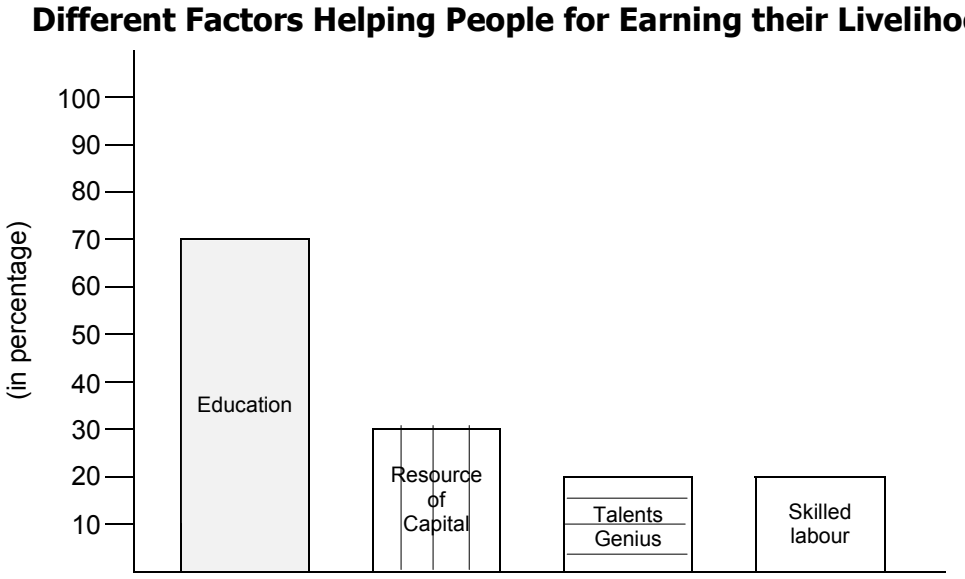
playing, are, beautiful, music, they

2. Write three sentences using each of the following words. **3 x 2 = 6**

(i) brilliant (ii) interview (iii) luxury

PART B - COMPOSITION : 20 Marks

II 1. Study carefully the following graphic and present the message in a paragraph of about 100 words. **5**



2. You need 5 Multimedia projectors for your office. Draft a letter calling for a quotation, giving details of your requirements. **5**

3. Write a report as the Chairman of a three-member committee, with a note of dissent, on the survey conducted to find out the reasons for the sudden fall in the sales of a particular product of your company. **5**

4. Bring out in a write-up of about 100 words, your experience in coming to the college from a distant place on a rainy day. **5**

PART C – PROSE : 25 Marks

III 1. Write an essay on any one of the following in about 200 words **1 x 10 = 10**

a)

b)

2. Annotate any three of the following : **3 x 5 = 15**

a)

b)

c)

d)

2002 – APPLIED MATHEMATICS

SEMESTER-II

Objectives:

- At the end of the training programme, the student will be able to acquire basic knowledge in vectors to apply in force analysis.
- Explain the concept of integral calculus
- Explain the physical and geometrical applications of differentiation
- Explain the applications of integration and to know to solve differential equations.
- Acquire basic knowledge in probability distribution.

SCHEME OF INSTRUCTION AND EXAMINATION

Subject	Instruction		Examination			
			Marks			Duration
	Period / Week	Period / Semester	Internal Assessment	End Examination	Total	
2002 – Applied Mathematics	7 Hrs.	112 Hrs.	25	75	100	3 Hrs.

TOPICS AND ALLOCATION

Sl.No	Topic	Time (Hrs)
1.	**Vector Algebra**	20
2.	Integral Calculus	20
3.	**Application of Differentiation**	20
4.	Application of Integration	20
5.	**Probability Distribution**	20
	Tutorial	12
	Total	112

DETAILED SYLLABUS

Unit-I

1. Vector Algebra

1.1 Introduction:

Definitions, Types, Addition, and Subtraction of Vectors. Properties, position vector, resolution of vector in two and three dimensions. Direction cosines and direction ratios of vectors. Simple problems. **[6 Hours]**

1.2 Product of Vectors:

Scalar and vector product of two vectors – Geometrical meaning – Angle between two vectors – Unit vector perpendicular to two vectors. **[7 Hours]**

1.3 Applications of vectors:

Work done-moment-Scalar and vector triple product- Geometrical interpretation of scalar triple product –Coplanar vectors. Scalar and vector product of four vectors. Simple problems. **[7 Hours]**

Unit-II

2. Integral Calculus

2.1 Integration:

Definition – Integral values using reverse process of differentiation. Integration using decomposition method. Integration by substitution – Integrals of the form $\int [f(x)]^n f'(x)dx,\ \ n \neq -1$, $\int \frac{f'(x)}{f(x)}dx,\quad \int F(f(x))f'(x)dx$ **[6 Hours]**

2.2 Standard Integrals:

Integral of the form $\int \frac{dx}{(a^2 \pm x^2)}$, $\int \frac{dx}{x^2 - a^2}$, $\int \frac{dx}{\sqrt{a^2 - x^2}}$, $\int \frac{dx}{(x+a)(x+b)}$, $\int \frac{(Ax+B)dx}{ax^2+bx+c}$ – simple problems. **[7 Hours]**

2.3 Integration by parts:

Integration by parts and Bernoulli's form to evaluate $\int x \sin\ nx\,dx,\ \int x\cos nx\,dx,\ \int x^2 e^{ax}\,dx$. $\int x^n \log x\,dx,\ \int \log x\,dx,$ **[7 Hours]**

Unit-III

3. Application of Differentiation

3.1 Velocity and Acceleration, Tangents and Normals – Simple Problems. **[7 Hours]**

3.2 Maxima and Minima of single variable – Simple Problems. **[6 Hours]**

3.3 Partial differentiation of two variables upto second order only- Euler's Therom- Simple Problems. **[7 Hours]**

Unit-IV

4. Application of Integration

4.1 Definite Integral. Area and Volume – Area of circle, volume of sphere and cone – Simple Problems. **[7 Hours]**

4.2 Solution of differential equations- Variable separable - linear type differential equations- simple problems. **[7 Hours]**

4.3 Second order differential equation with constant coefficients. **[6 Hours]**

$a\frac{d^2y}{dx^2}+b\frac{dy}{dx}+cy=e^{ax}$ where $f(a)\neq 0.$

Unit-V

5. Probability Distributions

5.1 Random variable: Types of random variable – Definition of Discrete Random Variable, Probability mass function, continuous random variable and probability density function- Simple problems. **[6 Hours]**
Mathematical expectation of discrete random variable. Simple problems.

5.2 **Discrete Distributions**

Binomial distribution:

$$p(X=x)=\begin{cases} nC_x\ p^x q^{n-x} & x=0,1,2.....n \\ 0 & otherwise \end{cases}$$ **[8 Hours]**

Statement only -
Expression for mean, variance and standard deviation - simple problems.

Poisson Distribution:
Definition of Poisson distribution

$$p(X=x)=\begin{cases} \frac{e^{-\lambda}\ \lambda^{x}}{x!} & x=0,1,2..... \\ 0 & otherwise \end{cases}$$

Statement only. Expression for mean, variance and standard deviation - Simple problems.

5.3 **Continuous Distribution:** **[6 Hours]**

Normal Distribution: Definition of normal and standard normal distribution. Statement only. Constants of normal distribution (results only) - Properties of normal distribution – Simple problems using the table for standard normal distribution

Reference Book:

(1) Higher Secondary – Second Year – Tamil Nadu Text Book Cooperation.

(2) Engineering Mathematics – Dr. M. K.Venkatraman, National Publishing Co, Chennai.

(3) Engineering Mathematics – Dr. P.Kandasamy & Others, Schand & Co Ltd., New Delhi.

APPLIED MATHEMATICS
SEMESTER-II
MODEL QUESTION PAPER -I

Time: 3 hours Max. Marks: 75

PART – A

I. Answer all questions **(5 X 1 = 5)**

1 Write the condition for two vectors $\vec{a}$ and $\vec{b}$ to be perpendicular

2 Evaluate $\int \frac{dx}{\sqrt{1-x^2}}$

3 If $S = 2t^3$ find the velocity at t=2 seconds

4 Solve: $xdx = ydy$

5 If the mean of the Poisson distribution is 4, what is the value of the variance and S.D?

PART – B

II. Answer any TEN questions **(10 X 2 = 20)**

1 Find the area of a triangle whose adjacent sides are $\vec{i} + \vec{j} + \vec{k}$ and $\vec{i} + 2\vec{j} - 3\vec{k}$

2 Find the value of $\vec{i} + \vec{j},\ \vec{j} + \vec{k},\ \vec{k} + \vec{i}$

3 Find m for which the vectors $2\vec{i} + \vec{j} - 2\vec{k},\ \vec{i} + \vec{j} + 3\vec{k}$ and $m\vec{i} + \vec{j}$ are coplanar

4 Evaluate: $\int \tan^2 x dx$

5 Evaluate: $\int \frac{dx}{5 + 4x^2}$

6 Evaluate: $\int xe^x dx$

7 If $S = 4t - 5t^2 + 2t^3$ find the velocity after 3 seconds

8 Write down the condition for a function f(x) to be maximum at x =a

9 If $u = x^2 + y^2$ prove that $x\frac{\partial u}{\partial x} + y\frac{\partial u}{\partial y} = 2u$

10 Find the volume of the solid formed when the area bounded by the curve $y = x^2$ between x=0 and x=2 and the x-axis

11 Find the integrating factor of $\frac{dy}{dx} + y\cot x = x\,\mathrm{cosec}\,x$

12 Solve: $\frac{d^2y}{dx^2} + y = 0$

13 A random variable X has the following distribution

X	0
	1
	2
	3
	4
P(X=x)	2K
	3K
	5K

7K

6K

Find the value of K

14 In a Binomial distribution the mean is 6 and the variance is 2, find n and p.

15 Define normal distribution.

PART – C

NB: 1) Answer all questions choosing any two subdivisions from each question.

2) All questions carry equal marks. (10 X 5 = 50)

III. a. The position vectors of the vertices of the triangle are $2\vec{i} + 3\vec{j} + 4\vec{k}$, $3\vec{i} + 4\vec{j} + 2\vec{k}$, and $4\vec{i} + 2\vec{j} + 3\vec{k}$ Prove that the triangle is equilateral.

b. Find the unit vector perpendicular to $2\vec{i} - \vec{j} + \vec{k}$ and $3\vec{i} + 4\vec{j} - \vec{k}$. Also find the sine of the angle between them.

c. If $\vec{a} = 2\vec{i} + 3\vec{j} - \vec{k}$, $\vec{b} = \vec{i} + \vec{j} + \vec{k}$, $\vec{c} = \vec{j} + 2\vec{k}$ and $\vec{d} = 3\vec{i} - 2\vec{j}$, find $(\vec{a} \times \vec{b}) (\vec{c} \times \vec{d})$.

IV. a. Evaluate: (i) $\int (2x+3)(x-1)dx$ (ii) $\int \frac{x^2-2}{x^3-6x+4}dx$

b. Evaluate: (i) $\int \frac{x+1}{x^2+6x+25}dx$ (ii) $\int \frac{dx}{x^2-3x+2}$

c. Evaluate: (i) $\int x^2 \operatorname{Cos} x\, dy$ (ii) $\int x^3 \log x\, dx$

V. a. Find the equation of the tangents to the curve $y = x^2 + 5x + 6$, where it cuts the x axis.

b. Find the maximum and minimum values of the function $2x^3 - 3x^2 - 36x + 10$.

c. If $u = \tan^{-1}\left(\frac{x^3+y^3}{x-y}\right)$ show that $x\frac{\partial u}{\partial x} + y\frac{\partial u}{\partial y} = \sin 2u$.

VI. a. Find the volume of a sphere of radius *r* by integration.

b. Solve: $\frac{dy}{dx} - \frac{2y}{x} = x^2 \operatorname{Sin} x$.

c. Solve: $\frac{d^2y}{dx^2} + 5\frac{dy}{dx} + 6y = 3e^{2x}$.

VII. a. A random variable X has the following distribution

X	:	-1	0	1	2
P(X=x)	:	$\frac{1}{3}$			

$$\frac{1}{6}$$
$$\frac{1}{6}$$
$$\frac{1}{3}$$

Find the mean and variance.

b. Ten coins are tossed simultaneously find the probability of getting atleast 7 heads.

c. In an aptitude test administered to 900 students, the scores obtained by the students are distributed normally with mean 50 and standard deviation 20. Find number of students whose score is (i) between 30 and 70 (ii) exceeding 60.

MODEL QUESTION PAPER - II
APPLIED MATHEMATICS
SEMESTER-II

Time: 3 hours Max. Marks: 75

PART – A

I. Answer all questions **(5 X 1 = 5)**

1. Find the unit vector along the vector $4\vec{i} - 5\vec{j} + 7\vec{k}$

2. Find the value of $\int \frac{f'(x)}{f(x)}dx$

3. If $u = x^3 + y^3$, find $\frac{\partial^2 u}{\partial x^2}$.

4. What is the integrating factor of the differential equation $\frac{dy}{dx} + Py = Q$?

5. In a binomial distribution is n=9 and $p = \frac{1}{3}$, what is the value of variance?

PART – B

II. Answer any TEN questions **(10 X 2 = 20)**

1. If the position vectors of the points P and Q are $3\vec{i} + 2\vec{j} - \vec{k}$ and $7\vec{i} + 5\vec{j} + 2\vec{k}$ find $\left|\overrightarrow{PQ}\right|$.

2. Find the projection of the vector $8\vec{i} + 3\vec{j} + 2\vec{k}$ and $\vec{i} + \vec{j} + \vec{k}$ on the vector

3. Find the work done by the force $3\vec{i} + 5\vec{j} + 7\vec{k}$ when the displacement is $2\vec{i} - \vec{j} + \vec{k}$

4. Evaluate: $\int \frac{1}{x\sqrt{x^2 - 1}}dx$

5. Evaluate: $\int \frac{dx}{(x+2)(x+1)}$

6. Evaluate: $\int x \operatorname{Cos} x \, dx$.

7. Find the slope of the tangent to the curve $y = 2x^2 - 3x + 1$ at the point (2, 3).

8. If $u = x^2 + 3xy + y^2$ find $\frac{\partial^2 u}{\partial x \partial y}$.

9. Find the maxima or minima for $y = 4x - 2x^2$.

10. Evaluate: $\int_1^2 (x - x^2)dx$.

11. Solve: $\frac{dy}{dx} = \frac{1+y^2}{1+x^2}$.

12. Solve: $(D^2 - 16)y = 0$.

13. Show that $f(x) = \begin{cases} \frac{1}{9}x^2 & 0 < x < 3 \\ 0 & \text{Otherwise} \end{cases}$ is a probability density function.

14. In a Poisson distribution, $P(X=0) = P(X=1)$, find 'λ'.

15. State two properties of normal curve.

PART – C

NB: 1) Answer all questions choosing any two subdivisions from each question.

2) All questions carry equal marks. **(10 X 5 = 50)**

III. a. If the position vectors of the vertices of a triangle are $3\vec{i} + \vec{j} - 5\vec{k}$, $4\vec{i} + 3\vec{j} - 7\vec{k}$ and $5\vec{i} + 2\vec{j} - 3\vec{k}$, show that it is a right angled triangle.

b. If $\vec{a} = -3\vec{i} + 4\vec{j} - 7\vec{k}$ and $\vec{b} = -6\vec{i} + 2\vec{j} - 3\vec{k}$, find $\vec{a} \times \vec{b}$. Verify that $\vec{a}$ is perpendicular to $\vec{a} \times \vec{b}$ and $\vec{b}$ is perpendicular to $\vec{a} \times \vec{b}$.

c. If $\vec{a} = 2\vec{i} + 3\vec{j} - \vec{k}$, $\vec{b} = -2\vec{i} + 5\vec{k}$ and $\vec{c} = \vec{j} - 3\vec{k}$ find $\vec{a} \times (\vec{b} \times \vec{c})$.

IV. a. Evaluate: (i) $\int \frac{\cos^2 x}{1+\sin x}\,dx$ (ii) $\int \cos^3 x \sin x\,dx$

b. Evaluate: (i) $\int \frac{dx}{(3x+2)^2 - 16}$ (ii) $\int \frac{3x+2}{x^2+x+1}\,dx$

c. Evaluate: (i) $\int (x+3)\text{Cos}5x\,dx$ (ii) $\int \log x\,dx$

V a. The distance traveled by a particle along the straight line is given by $s = 2t^3 + 3t^2 - 72t + 1$. Find (i) initial velocity (ii) acceleration when velocity is zero.

b. Find the maximum and minimum values of the function $2x^3 - 15x^2 + 36x + 18$.

c. If $u = \log(x^2 + y^2)$ find $x\frac{\partial u}{\partial x} + y\frac{\partial u}{\partial y}$.

VI a. Find the volume of right circular cone of base radius *r* and height *h* by integration.

b. Solve: $\frac{dy}{dx} + \frac{3y}{x} = x^2 - 1$.

c. Solve: $(D^2 + D + 1)y = 2e^{-3x}$.

VII a. A random variable x has the following probability distribution

X	0	1	2	3	4
P(X=x)	3a	4a	5a	6a	7a

Find the value of (i) 'a' (ii) $E(X^2+X)$

b. In a Binomial distribution $P(X=0) = 0 \cdot 4$, $P(X=1) = 0 \cdot 2$ and n=6 find 'p'.

c. If X is normally distributed with mean 6 and standard deviation 5.
Find: (i) $P(-4 < X < 16)$ (ii) $P(X>11)$

2003 ENGINEERING PHYSICS II
SEMESTER-II

OBJECTIVES

- At the end of the programme, the student will be able to acquire basic knowledge in heat
- To explain isothermal and adiabatic changes
- To explain the process in the liquefaction of gases
- To get an understanding of various non-conventional energy sources and their uses
- To understand the concepts in electricity and electronics and list out their applications
- To state various laws connected with heat, light, magnetism and electricity

SCHEME OF INSTRUCTION AND EXAMINATIONS

Subject	Instruction		Examination			
	Hours/week	Hours/Semester	Marks			Duration
			Internal A	Board Exam	Total	

			sessment	ination		
2003 Engineering Physics	3 Hrs	48 Hrs	25	75	100	3 Hrs

TOPICS AND ALLOCATION

SL.No	Topic	Time (Hrs)
Unit 1	Heat	10
Unit 2	Liquefaction of Gases and non Conventional Energy	8
Unit 3	Light and Magnetism	10
Unit 4	Electricity	10
Unit 5	Chemical effect of Current, Capacitors and Electronics	10
	Total	**48**

2003 ENGINEERING PHYSICS II
SEMESTER-II

Unit -1

Heat

1.1 Heat - Kinetic Theory of Gases:

Postulates- Derivation of pressure of a gas- Relation between pressure and kinetic energy- Deduction of Boyle's law and Charle's law from the equation $p=1/3mnc^2$

(4hrs)

1.2 Specific Heat:

Definitions of specific heat capacity of a solid, liquid, gas- Specific heat capacity of a gas at constant volume – Specific heat capacity of a gas at constant pressure- Derivation of Mayer's relation -Calculation of R using PV=RT

(4hrs)

1.3 Isothermal and Adiabatic Changes:

Explanation of Isothermal and Adiabatic changes.

(Direct and simple problems may be asked)

(2 hrs)

Unit -2

2.1 Liquefaction of Gases:

Definition of Critical temperature, Critical pressure and Critical volume- Temperature of Inversion- Joule Thomson Effect- Experiment to Liquefy the Gases – Linde's process – cascade process.

(4hrs)

2.2 Non Conversional Energy:

Renewable and Non-renewable sources of energy- Examples- Advantages and disadvantages- Alternate sources of Energy-Solar, Wind, Tidal, Geothermal, Hot dry rock and Bio mass. (Direct and simple problems may be asked)

(4hrs)

Unit-3

3.1 Light:

Optical Instruments- Principle of Sextant- Sextant- Elevation and Height of the Building. Spectrometer –Description-Derivation of the expression for the Refractive Index of the material of the prism using angle of minimum deviation- Laser principle- Ruby Laser-Construction and Working- uses

(6hrs)

3.2 Magnetism:

Definitions of pole strength, Magnetic moment- Magnetic induction (B), Intensity of magnetic field(H) -Permeability- Intensity of magnetism(M) and Hysteresis- Experiment to draw Hysteresis Loop- Definition of Retentivity, Coercivity and Saturation- Selection of magnetic materials for permanent and temporary magnets.

(4hrs)

Unit-4

ELECTRICITY

4.1 Electrical Circuits:

Ohm's law – Laws of resistance - Resistivity- Kirchoff's laws- Statements and explanation –Wheat Stones Bridge

(2hrs)

4.2 Force on a moving charge and measuring Instruments:

Force on a current carrying straight conductor- Femilng's left hand rule- Torque on a rectangular coil carrying current placed in a magnetic field- Moving coil galvanometer- Conversion of galvanometer into Voltmeter and Ammeter.

(5hrs)

4.3 Heating Effect of Electric Current:

Joule's law of heating effect- Determination of specific heat capacity of liquid. Applications: Working principle of fuse wire and heating element.

(Direct and Simple Problems may be asked)

(3hrs)

Unit - 5

5.1 Chemical Effect of Electric Current:

Faraday's law of electrolysis- Definition of e.c.e of an element

Application: Electroplating- experiment to determine e.c.e of copper.

(3hrs)

5.2 Capacitor:

Definition of capacitance of a Capacitor - Capacitors in series and Capacitors in parallel.

(2hrs)

5.3 Electronics:

Semiconductors – Doping-P Type and N Type semiconductors-PN Junction –Full wave Rectifiers- PNP And NPN Transistors –Common base configuration- Logic Gates- OR, AND, NOT, NAND NOR, And Ex-NOR Gates- Integrated Circuits IC-SSI, MSI, LSI, and VLSI

(5hrs)

Total hours: 48

Reference Books:

1. Srivastava – Electricity and Magnetism – S. Chand Publishers – New Delhi

2. J.B. Rajam – A Text Book of Heat - S. Chand Publishers – New Delhi

3. G. D. Rai – Non- Conventional Energy Sources – Khanna Publishers – New Delhi.

2003 Engineering physics II

Model Question paper 1

Time: 3hrs **Max mark 75**

Part A

Marks 5x1=5

I Answer all question

1. Give the relation between pressure and kinetic energy of a gas.
2. What is the critical temperature of air?
3. What is LASER?
4. What is the unit for magnetic induction?
5. Name any one universal logic gate.

Part B

Marks 10x2 =20

II. Answer any ten questions.

All questions carry equal marks.

1. Explain specific heat capacity at constant volume.
2. State Boyle's law.
3. State two postulates of kinetic theory of gas.
4. What is critical temperature?
5. Define Joule-Thompson effect.
6. Give the advantages of renewable sources of energy.
7. Give the uses of LASER.
8. What is stimulated emission?
9. Define retentivity.
10. State ohm's law.
11. State Flemings left hand thumb rule.
12. State Joule's law of heating.
13. What is electroplating?
14. Define electro chemical equivalent of an element.

15. What is doping?

Part C

Answer all questions, choosing any two sub-divisions from each question.

All questions carry equal marks.

III a. Deduce Boyle's law and Charles's law from the expression for the pressure of gas.

b. Derive Mayer's relation between two specific heats of a prefect gas.

c. The ratio of specific heat capacities of Helium is 1.66.Calculate its specific heat capacity at constant volume and at constant pressure. Given R =8.29J/K/mol

IV a. Describe Linde's process for the liquefaction of air.

b. Write short notes on Tidal and bio mass energy.

c. Air at 2 atmospheric pressure is compressed isothermally to one fourth of its original volume. Find the final pressure.

V a. Explain how sextant is used to find the height of a building.

b. Explain the uses of hysteresis loops.

c. The angle of a glass prism is 60^o and angle of minimum deviation is 38^o. Calculate the refractive index of the prism.

VI a. Derive an expression for the torque on a coil, carrying current placed in a magnetic field.

b. Describe an experiment to determine the specific heat capacity of liquid using Joule's calorimeter.

c. A galvanometer of 80 ohms can carry a maximum current of 5mA. How can it be converted into an ammeter to measure a maximum current of 2 amperes?

VII a. Describe an experiment to determine the e.c.e of copper.

b. Derive an expression for the equivalent capacitance of capacitors connected in parallel.

c. Explain the working of PN junction diode.

2003 Engineering physics II

Model Question paper 2

Time: 3hrs **Max mark 75**

Part A

Marks 5x1=5

I Answer all question

1. Give the S.I unit of heat.
2. What is the Critical temperature of oxygen.
3. Give two examples of non-renewable energy sources.
4. What is the unit of resistivity.
5. Name the impurity in the N-type semi-conductor.

Part B

Marks 10x2 =20

II. Answer any ten questions.

All questions carry equal marks.

1. Define specific heat at constant pressure.
2. Define Charle's law
3. Define mean free path.
4. What is critical pressure?
5. Define temperature of inversion.
6. What are non-renewable sources of energy?
7. Define refractive index.
8. Give the principle of sextant.
9. Define intensity of magnetization.
10. Define resistivity.
11. State Kirchoff's law.
12. Explain how fuse works.
13. State Faraday's law.
14. Define Capacitance.

15. What is an integrated circuit?

Part C

Marks 10x5=50

Answer all questions, choosing any two sub-divisions from each question.

All questions carry equal marks.

III a. Based on kinetic theory of gas, derive an expression for pressure of a gas.

b. Derive an expression for kinetic energy of a gas.

c. At S.T.P calculate the value of R, from the equation PV=RT.

IV a. Describe Cascade process to liquefy oxygen.

b. Write short notes on solar and wind energies.

c. A certain volume of air at S.T.P is suddenly compressed to half its original volume. Calculate the =1.5)□resulting pressure. (

V a. Describe ruby laser.

b. Derive an expression for the refractive index of the material of the prism using angle of minimum deviation.

c. Briefly explain hysteresis loop.

VI a. Derive the condition to balance the wheatstone's bridge by using Kirchoff's law.

b. Describe the working of a moving coil galvanometer.

c. Explain how a galvanometer is converted into an ammeter.

VII a. Derive an expression for the equivalent capacitance of capacitors connected in series.

b. With the help of truth table explain AND and OR gates.

c. In a copper voltameter experiment, the amount of copper deposited is 1.2gms, when a current of 1 ampere passes for 1 hour. Calculate the e.c.e of copper.

2004 - ENGINEERING CHEMISTRY-1I

SEMESTER-II

OBJECTIVES:

- At the end of the programme, the student will be able to understand the concepts of Fission, Fusion reaction and mention the applications of isotopes in Industries
- To acquire knowledge about various types of Fuels including Rocket propellants
- To explain Rain Water Harvesting, softening of Hard Water for Industrial purposes
- To understand Organic Polymers like Plastics, Rubber and their applications
- To explain Metallurgy of Tungsten, Titanium and applications of alloys
- To acquire knowledge about various Engineering materials like Refractories, Abrasives

SCHEME OF INSTRUCTIONS AND EXAMINATIONS

Subject	Instructions		Examination			
	Hours/week	Hours/Semester	Internal assessment	Board Examination	Total	Duration
2004Engineering Chemistry-II	3 Hours	48 Hours	25	75	100	3 Hrs

TOPICS AND ALLOCATION

Sl. No.	Topics	Time (Hours)
Unit-1	Nuclear Chemistry, Abrasives	8 Hours
Unit-2	Fuels, Refractories	9 Hours
Unit-3	Technology of Water, Lime	8 Hours
Unit-4	Plastics, Rubber	9 Hours
Unit-5	Metallurgy,Alloys	8 Hours
	Revision and Examinations	6 Hours
	TOTAL	48 Hours

2004 - ENGINEERING CHEMISTRY- II

SEMESTER-II

UNIT- I

1. Nuclear chemistry - Radio activity - definition-alpha, beta, gamma rays-properties-isotope-isobar-definition – example - radio active decay-alpha, beta decay examples- Group displacement law - Half life period- definition - simple problems - Nuclear fission – fission of U235- Fusion-reaction in SUN – artificial radioactivity-definition - examples-Definitions of nuclear reactor, reactor core, reflector, pressure vessel, shielding, heat exchanger &turbine - Applications of radio active isotopes in industries. **(5Hrs)**

2. Abrasives – Definition – classification - hardness in mohs scale - natural abrasives -Diamond, Corundum, Emery, Garnet-synthetic abrasives - Carborundum - Boron carbide-manufacture-uses **(3hrs)**

UNIT- II

1. Fuels - Definition-calorific value - classification-solid fuels-wood-varieties of coal-composition-specific uses-liquid fuels-petroleum-fractional distillation and their uses-cracking(concept only)-gaseous fuels-preparation and specific uses of producer gas, water gas, bio gas-LPG-composition and uses -advantages of gaseous fuels.

Rocket Propellants – Definition – Characteristics – Classification of Propellants - brief account of Solid & Liquid propellants with example. (**7Hrs)**

2. Refractories – Definition – requirements - classification with examples & uses - uses of fireclay bricks – aluminabricks - silicabricks. **(2hrs)**

UNIT- III

1. Technology of Water – sources - depletion of under ground water - reasons - Rain water harvesting - (basic ideas)-advantages - hard and soft water-carbonate, non carbonate hardness-methods of expressing hardness-mg / lit, ppm-simple problems-estimation of Total hardness by EDTA method – problems involving total,carbonate,non-carbonate hardness in ppm softening of hard water- ion exchange, reverse osmosis methods - water for drinking purpose-purification (sedimentation, filtration, sterilization) - Disadvantages of hard water in boilers-scale formation and corrosion. **(6Hrs**)

2.Lime lime-types-manufacture of Hydraulic lime by continuous vertical kiln process-properties-slaking-plasticity-setting. **(2Hrs**)

UNIT- IV

1. Plastics – Types - thermoplastics, thermo set plastics – differences - mechanical properties - advantage over traditional materials(wood &metals) - specific uses of bakelite, PVC, nylon, urea formaldehyde.-reinforced or filled plastics-definition-advantages – applications - polymers in surgery – biomaterial – definition - Bio medical uses of polyurethane, pvc, polypropylene, polyethylene. **(5Hrs)**

2. Rubber - Natural rubber- preparation from latex-defects of natural rubber-compounding-ingredients &their functions- vulcanization(No equation) -purpose-synthetic rubber-Buna-S, Thiokol, Neoprene (Preparation &specific uses only - no equation)reclaimed rubber - definition-process - properties-uses **(4Hrs)**

UNIT-V

1. Metallurgy - metallurgy of Tungsten &Titanium and their uses - powder metallurgy –definition-industrial applications. **(6Hrs)**

2. Alloys –Definition - purpose of alloying - Non ferrous alloys – Definition - composition and Uses of Nickel alloys - Ni chrome, Iocanel- Copper Alloys – composition and uses of – Brass - Dutch metal – German silver - Bronze –Coinage bronze – Gunmetal - Aluminium Alloys – composition and uses of – Duralumin – magnalumin **(2Hrs)**

Industrial Visits to Effluent treatment plants, Abrasive Industries, Water treatment plants etc are desirable for better understanding.

ENGINEERING CHEMISTRY – II

MODEL QUESTION PAPER – I

Time: 3 Hrs **Max. Marks: 75**

	PART – A	
I.	**Answer all Questions Only:**	**5 X 1 = 5**
	1) What is the hardness of the diamond in Moh's Scale? 2) Give an example for acid refractories. 3) What is the lime? 4) Give an example for thermo plastic. 5) Give One ore example of Titanium.	
	PART – B	
II.	**Answer any Ten Questions Only:**	**2 X 10 = 20**
	1) Define half life period. 2) Define Isobar. 3) Define Abrasive. 4) Define Calorific Value of a fuel. 5) What is LPG? 6) What are refractories? 7) Give reasons for hardness of water. 8) Give advantages of rain water harvesting. 9) What is setting of Lime? 10) What are the uses of bakelite? 11) What are reinforced Plastics? 12) What is reclaimed Rubber? 13) Define Alloys. 14) Give composition&uses of Duralumin. 15) Give the composition of German Silver.	
	PART – C	
	Answer any two divisions from each Questions : **All Questions carry equal marks:**	**5 X 10 = 50**

III.	(a) What are the applications of radio active Isotopes in industries?
	(b) Explain Nuclear Fission reaction with an example.
	(c) Write the manufacture and the uses of carborundum.
IV.	(a) What are the advantages of gaseous fuels ?
	(b) Mention any five requirements of a good refractory.
	(c) Explain fractional distillation of petroleum.
V.	(a) Explain Ion – Exchange method of Softening of hard water.
	(b) Give the manufacture of hydraulic lime.
	(c) A sample of 100ml of water on titration with 0.01M of EDTA Solution consumed 35ml. The water was boiled for half an hour. On titration against the same EDTA solution it consumed 15ml less. Calculate carbonate hardness and Non – Carbonate hardness in PPM.
VI.	(a) Explain vulcanization of Rubber.
	(b) Give differences between two types of Plastics.
	(c) What are the advantages of reinforced Plastics?
VII.	(a) Write the metallurgy of Tungsten.
	(b) Give the purpose of alloying.
	(c) Write the Industrial applications of Powder metallurgy.

ENGINEERING CHEMISTRY –II

MODEL QUESTION PAPER –II

Time: 3 hrs **Max. Marks: 75**

	PART – A	
I.	**Answer all Questions Only:**	**5 X 1 = 5**
	1) What is the charge of α- rays? 2) Give example of neutral refractory? 3) What is soft water? 4) What is latex? 5) Write one use of locanel?	
	PART - B	
II.	**Answer any Ten Questions Only:**	**10 X 2 = 20**
	1) Define radioactivity. 2) Define nuclear reactor. 3) What is emery? 4) What is water gas? 5) Define cracking. 6) What are the uses of silica bricks? 7) Give reasons for depletion of ground water? 8) Define reverse Osmosis? 9) What is slaking of lime? 10) What are the uses of polyurethane and PVC in surgery? 11) Give the reasons for vulcanization? 12) What are the types of Plastics? 13) Write the composition and uses of Gunmetal? 14) Define powder metallurgy 15) Define non ferrous alloys.	
	PART – C	
	Answer any two divisions from each Questions : **All Questions carry equal marks:**	**10 X 5 = 50**
III.	(a) Explain nuclear fussion reaction with example?	
	(b) Write a note on natural abrasives?	
	(c) Give the properties of α, β and γ – rays?	
IV.	(a) Write a note on solid fuels?	
	(b) Give classification and uses of refractories with examples.	
	(c) Give the preparation and uses of producer gas.	
V.	(a) How drinking water is purified? Explain.	
	(b) What are the disadvantages of hard water in boilers?	
	(c) How the hardness of water is estimated by EDTA method?	
VI.	(a) What are the advantages of plastics over traditional materials?	
	(b) Write a note on synthetic rubber.	
	(c) What are the properties of re-claimed rubber?	
VII.	(a) Write the metallurgy of Titanium.	
	(b) Write a note on Aluminium alloys.	
	(c) Write a note on Nickel alloys.	

2006 PHYSICS PRACTICAL

SEMESTER I & II

OBJECTIVES

- At the end of the programme, the student will be able to measure the length, thickness using vernier caliper and screw gauge.
- To verify the laws of forces.
- To determine the acceleration due to gravity and modulus of elasticity using pendulums.
- To determine the coefficient of viscosity and surface tension.
- To develop skills in using instruments like spectrometer and deflection magnetometer.
- To understand the basic principles of electricity by doing experiments like copper voltameter, joules calorimeter, potentiometer etc.
- To have an understanding of the solar cells.

SCHEME OF INSTRUCTION AND EXAMINATIONS

Subject	Instructions		Examination			
	Hours/week	Hours/Semester	Internal assessment	Board Examination	Total	Duration
2006 Engineering Chemistry Practical	2 Hours	64 Hours	25	75	100	3 Hrs

EXAMINATION EVALUATION

1. Internal Assessment	25
2. Formula	10
3. Tabular Column and circuit diagram	10
4. Observations	30
5. Calculation	15
6. Result	5
7. Viva-voce	5

Total **100**

2006 PHYSICS PRACTICAL

SEMESTER I & II

1 VERNIER CALIPERS - To find the volumes of the solid cylinder and hollow cylinder using vernier callipers.

2 SCREW GAUGE – To find the thickness of (a) glass plate (b) given sphere using screw gauge. Hence calculate the volume of the glass plate and the sphere.

3 SIMPLE PENDULUM – To find the acceleration due to gravity in the laboratory, using simple pendulum. Calculate the acceleration due to gravity, by L–T^2 graph.

4 CONCURRENT FORCES -To verify the parallelogram law of forces and Lami's theorem.

5 COPLANAR – PARALLEL FORCES – To verify the conditions of the Co-planar parallel forces.

6 TORSION PENDULUM – To find the rigidity modulus of the thin wire and moment of inertia of the disc by using symmetric masses.

7 COMPARISON OF VISCOSITIES – To compare the coefficient of viscosities of two liquids by capillary flow method.

8 VISCOSITY OF A HIGHLY VISCOUS LIQUID – To find the coefficient of viscosity of a highly viscous liquid.

9 SURFACE TENSION – To find the surface tension of the given liquid by capillary rise method.

10 YOUNG'S MODULUS – To find the young's modulus of the material of the given metre scale.

11 SPECTROMETER – 1. To find the angle of the prism.

12 SPECTROMETER – 2. To find the refractive index of the material of the prism.

13 DEFLECTION MAGNETOMETER – To compare the magnetic moments of two given magnets by (a) Equal distance method and (b) Null method.

14 SONO METER – To find the frequency of the given tuning fork.

15 JOULE'S CALORIMETER – To determine the specific heat capacity of the given liquid.

16 COPPER VOLTAMETER – To determine electro – chemical – equivalent of copper.

17 OHM'S LAW – To determine the resistance of two given coils of wire using Ohm's law. Also verify the laws of resistances.

18 POTENTIO METER – To compare the e.m.fs of two given cells.

19 PN JUNCTION DIODE – For the given semiconductor diode draw (a) Forward bias (b) Reverse bias characteristic curves.

20 SOLAR CELLS – V. I. Characteristics.

2006 PHYSICS PRACTICAL

MODEL QUESTION PAPER

TIME: 3 HRS **MAX MARKS 100**

1 Find the volumes of the solid cylinder and hollow cylinder using vernier callipers.
2 Find the thickness of (a) glass plate (b) given sphere using screw gauge. Hence calculate the volume of the glass plate and the sphere.
3 Find the acceleration due to gravity in the laboratory, using simple pendulum. Calculate the acceleration due to gravity, by L–T^2 graph.
4 Verify the parallelogram law of forces and Lami's theorem.
5 Verify the conditions of the Co-planar parallel forces.
6 Using torsion pendulum, find the rigidity modulus of the thin wire and moment of inertia of the disc by using symmetric masses.
7 Compare the coefficient of viscosities of two liquids by capillary flow method.
8 Using stoke's method, find the coefficient of highly viscous liquid.
9 Find the surface tension of the given liquid by capillary rise method.
10 Find the young's modulus of the material of the given metre scale.
11 Find the refractive index of the material of the prism using spectrometer.
12 Compare the magnetic moments of two given magnets by (a) Equal distance method and (b) Null method.
13 Find the frequency of the given tuning fork using sonometer.
14 Determine the specific heat capacity of the given liquid using Joule's calorimeter.
15 Determine electro – chemical – equivalent of copper using copper voltameter.
16 Determine the resistance of two given coils of wire using Ohm's law. Also verify the laws of resistances.
17 Compare the e.m.fs of two given cells using potentiometer.
18 For the given semiconductor diode draw (a) Forward bias (b) Reverse bias characteristic curves.

19 Draw the V.I. Characteristics using the solar cell.

2007 - ENGINEERING CHEMISTRY PRACTICAL

OBJECTIVES:

- At the end of the programme, the student will be to identify the Acid, and Basic Radicals in a given chemical substance like pollutant, fertilizer, fungicide, mordant, lime stone, electrolyte, gypsum, epsum.
- To analyse effluent to find out the presence of heavy metals and to know their bad effect.
- To impart knowledge about volumetric analysis in Acidimetry, Alkalimetry, Permanganimetry
- To give knowledge about estimation of Hardness present in the Water
- To give knowledge about measurement of pH in various solutions

SCHEME OF INSTRUCTIONS AND EXAMINATIONS

Subject	Instructions		Examination			
	Hours/week	Hours/Semester	Internal assessment	Board Examination	Total	Duration
2007 Engineering Chemistry Practical	2 Hours	64 Hours	25	75	100	3 Hrs

EXAMINATION EVALUATION

1.	Internal Assessment	: 25 marks
2.	Volumetric Analysis	: 40 marks
3.	Analysis of chemical substance	: 30 marks
4.	Viva-voce	: 05 marks
	TOTAL	100 marks

2007 - ENGINEERING CHEMISTRY - PRACTICAL

SEMESTER- I & II

1. Qualitative Analysis:-

Study of the reactions of the following radicals leading to qualitative analysis of the given **CHEMICAL SUBSTANCE** soluble in water or dilute acids .

Acid radicals: Chloride, Carbonate, Sulphate, Nitrate

Basic radicals: Lead, Cadmium, Copper, Aluminium, Zinc, Calcium, Magnesium, Ammonium.

Identification of acid and basic radicals in

1.Lime Stone (Calcium Carbonate)
2.Pollutant (Lead nitrate or **Cadmium Carbonate**)
3.Fertilizer(Ammonium sulphate)
4.Electrolyte(Ammonium Chloride)
5.Fungicide(Copper sulphate)
6.,Coagulant(Aluminium Sulphate)
7.Mordant(Zinc Sulphate)
8.Gypsum(Calcium Sulphate)
9.Epsum(Magnesium Sulphate)

Students may be asked to analyse the above salts and write the analysis in record book with the title such as analysis of limestone, analysis of pollutant etc.

10**. Analysis of an Effluent (containing pollutants like Lead, Cadmium, Zinc, Copper**). Students may be given above four pollutants , in four **separate** test tubes in solution form and asked to report metallic pollutants with procedure **(Basic Radical Analysis Procedure)** and their harmful effects.

In the examination two effluents in two separate test tubes containing any two metallic pollutants of the above four may be given. Any two students may be given this question per batch.

1. VOLUMETRIC ANALYSIS (DOUBLE TITRATIONS) :-

ACIDIMETRYAND ALKALIMETRY

1. **Estimation of Hydrochloric acid**
2. **Estimation of Sodium Hydroxide**
3. **Estimation of Sodium Carbonate**
4. **Comparison of Strengths of two bases**

PERMANGANIMETRY

5. **Estimation of Ferrous Ammonium Sulphate**
6. **Estimation of Ferrous Sulphate**
7. **Comparison of Potassium Permanganate.**

WATER ANALYSIS

8. **Estimation of Total Hardness by EDTA method.**

9. **Calculation of pH of four sample solutions and calculation of H+ Ion concentration for a particular sample solution.**

This question may be given for any two students per batch.

Reference:

1. Vogel - Analytical chemistry – Pearson publication
2. Dr. Sudha rani - Laboratory manual on engineering chemistry Dhanpat rai publication

SCHEME OF VALUATION

		Marks
I.	**QUALITATIVE ANALYSIS:-**	
	a) Identification of Acid radical with systematic procedure	14
	b) Identification of Basic radical with systematic procedure	14
	c) Name of the Chemical Substance	2
	d) Spotting of radicals	2 + 2
	For Effluent Analysis:-	
	Identification of Each Metallic Pollutants with systematic procedure	2 X 13 = 26
	Harmful effects of each Pollutants	2 X 2 = 4
	Spotting of pollutants	2+2= 4
II.	**VOLUMETRIC ANALYSIS:**	
	Short Procedure(common to all titrations).For pH values, any two part-A qns in pHchapter.may be asked.	5
	Viva Voce(common to all)	5
	Titration Value accuracy for I & II …….. ± 0.2 ml	13 X 2 = 26
	above ± 0.2 to 0.4 ml	9
	above ± 0.4 to 0.6 ml	5
	above ± 0.6 ml	2
	Calculations:	
	Titration I	3
	Titration II	3
	Result	3

Arithmetic error 25 % less Marks (OR)

DETERMINATION OF P^H VALUES:

Determination of P^H for Four Samples	**4 X 7.5 = 30**
Accuracy ± 0.2	**7.5**
Accuracy ± 0.2 to 0.4	**6**
Accuracy ± 0.4 and above	**4**
Calculation of H^+ ions	**1X5=5**

EDTA TITRATION

Titration-I	13
Titration-II	13
Calculation	9

Error in calculation 25%less

Accuracy on par with ordinary titration(as above)

ENGINEERING CHEMISTRY - PRACTICALS

MODEL QUESTION PAPER

I. Analyse the given chemical substance and report one Acid radical and Basic radical present in it.

(or)

Analyse the given samples of effluents given in two separate test tubes and report two metallic Pollutants with procedure and their harmful effects.(any two students only per batch) 30

Estimate the amount of Hydrochloric acid present in 500ml of given solution. You are given a standard solution of Sulphuric Acid of strength 0.09 N and an approximately decinormal solution of Sodium Hydroxide.

II (or)

Calculate the total hardness of the given sample of water. You are given standard hard water solution of 0.01 M and approximately 0.01M EDTA solution.

(or)

Calculate P^H of four sample solutions using P^H meter and calculate H+ Ions concentration of third sample(any two students only) 40

III. Viva Voce 5

2008 - Computer Application Laboratory

SEMESTER- I & II

OBJECTIVES

- At the end of the programme, the student will be able to acquire basic computer skills for various applications to students of all branches of study.
- Familiarize various operating systems
- Know the usage of word package
- Uderstand the facilities in a spread sheet.
- Prepare slides using power point.
- Acquire Auto CAD, Practical skill in using
- Make use of internet facility

Subject	Instruction		Examination			
	Hours/ Week	Hours per Year/ Semester	Marks			Duration
			Internal Assessment	Board Examination	Total	
2008 Computer Applications Lab	4 Hrs	128 Hrs	25	75	100	3 Hrs.

BASICS OF COMPUTER SCIENCE

WINDOWS

1. a. Starting a program, running a program.
   b. Starting the Windows in safe mode.
   c. Running multiple Programs and switching between windows.
   d. Moving the windows, and the task bar.
   e. Startup to MS-DOS prompt.

2. a. Creating and removing a folder.
   b. Making the taskbar wider, arranging icons on the Desktop.
   c. Displaying and hiding the taskbar clock.
   d. Controlling the size of start menu options.
   e. Creating shortcuts.

3. a. Installing a screen saver.
   b. Assigning Wallpaper to Desktop.
   c. Adding a program to the start menu.
   d. Recovering files and folders from Recycle bin.
   e. Customizing the mouse settings.
4. a. Expanding and collapsing a folder.
   b. Recognizing file types using icons.
   c. Running a program from explorer.
   d. Renaming a file or folder.
   e. Selecting two or more files for an operation.

5. a. Displaying the properties for a file or folder.
   b. Using cut and paste operations to copy a file.
   c. Using copy and paste operations to copy a file.
   d. Moving and copying files with mouse.
   e. Sorting a folder.

6. a. Finding a file or folder, by name.
   b. Defragmenting the disk using disk defragmenter.
   c. Compressing a file using WinZip.
   d. Controlling the speaker volume.
   e. Recording and saving an audio file.

MS – WORD

1. Prepare a newsletter with borders, two columns text, header and footer and a graphic image and spell check the document.
2. Create a table to show the paradigm of the verb “eat” in all 12 tenses

Tense		Present	Past	Future
Simple	He	Eats	Ate	Will eat
	I	Eat	Ate	Will eat
	You/They	Eat	Ate	Will eat
continuous	He	Is eating	Was eating	Will be eating
	I	Am eating	Was eating	Will be eating
	You/They	Are eating	Was eating	Will be eating
Perfect	He	Has eaten	Had eaten	Will have eaten
	I	Have eaten	Had eaten	Will have eaten
	You/They	Have eaten	Had eaten	Will have eaten
Perfect continuous	He	Has been eating	Had been eating	Will have been eating
	I	Have been eating	Had been eating	Will have been eating
	You/They	Have been eating	Had been eating	Will have been eating

3. Prepare your Bio-data/Resume
4. Do the mail merge operation for sending applications to many companies with your resume.

MS – EXCEL

1. Create a worksheet in Excel for a company:
   a. Copy, Move and Merge the cells
   b. Adding Comments
   c. Adding, Deleting the cells, Rows and Columns
   d. Hiding and Unhiding the columns, Rows and gridlines.
2. Using formula and functions prepare worksheet for storing subject marks of ten students and perform the following:
   a. Calculate the student wise total and average
   b. Calculate the subject wise total and average
   c. Calculate the overall percentage and also individual percentage of the student.

3. Create a Circle diagram (Pie chart) for the following data :

Breakup of the runs scored by Sachin Tendulkar

6's – 7	-	42
4's – 38	-	152
3's – 5	-	15
2's – 15	-	30
1's – 21	-	21
Total		260

4. Create a Bar diagram for the following data :

The population of different metropolitan cities

Chennai :	Men - 71,55,294;	Women – 75,24,115
Mumbai :	Men - 98,00,987	Women - 82,33,678
Calcutta :	Men - 81,24,865	Women – 77,28,346
Delhi :	Men - 1,43,25,086	Women – 99,87,242

MS – POWERPOINT

1. Create a simple presentation with atleast 5 slides to introduce your friend and include sounds in slides.
2. Create a presentation with 5 slides for the essay Astrologer's Day by R.K Narayanan

INTERNET

1. a. Creating an E-Mail account.
   b. Sending an E-Mail to a known Address
   c. Viewing an E-Mail received from your friend/relative.
2. a. Printing an E-Mail received
   b. Use of Attachment Facility
   c. Use of Address Book Facility
3. a. Use of Sent Folder
   b. Use of Save Draft Folder
   c. Use of Trash Folder
4. a. Browse a given web-site address.
   b. Search a Particular topic through a Search engine.

			Marks
BOARD EXAMINATION (3 hours)			**75**
PART-A	THEORY	1 HOUR	25 marks
PART-B	MS WORD		25 "
PART-C	EXCEL	2 HOURS	20 "
	VIVA-VOCE		5 "
			75 MARKS

COMPUTER APPLICATION LABORATORY (THEORY)
BASICS OF COMPUTER SCIENCE

INTRODUCTION TO COMPUTER

1.1 History of Computer

1.2 Data, Information & Program

1.3 Hardware and Software

1.4 Types of Computers

Summary

COMPUTER ORGANIZATION

2.1 Basic Components of a digital computer

2.2 Central Processing Unit

2.3 Arithmetic & logic unit - ALU

2.4 Memory Unit

Summary

OPERATING SYSTEM

3.1 Introduction

3.2 Major features of the operating systems

3.3 Most desirable characters of the operating system

Summary

COMPUTER COMMUNICATIONS

4.1 Introduction

4.2 Network

4.3 Reasons for Networking

4.4 Applications of network

4.5 Benefit of Network

4.6 Types of Network

4.7 Network Topology

4.8 Basics of Networking

4.9 Common Network services

5.0 Coordinating Data Communication

5.11 Forms of Data Transmission

5.12 Modern

5.13 Data Transformation

5.14 Transmission mode

5.15 Internet

5.16 Communication Protocol

5.17 Internet, uses and its future

5.18 Popular uses of the Web

5.19 Internet &

A Question Paper may be set by the External Examiner appointed by the Chairman, Board of Examination for the Basics of Computer Science theory for 30 marks in the following pattern

I. 2 mark questions (no choice)	5 Nos.	10 marks
II. 5 mark questions (out of which 3 question to be answered)	5 Nos.	15 marks
		25 marks

Theory Examination	1 Hour	25 marks
Practical Examination	2 Hours	45 marks
Viva-voce		5 marks
		75 marks

1009 - WORKSHOP PRACTICE
SEMESTER I & II

OBJECTIVES :

- At the end of the programme, the student will be able to acquire skills in basic of engineering practice
- To identify the hand tools and measuring instruments
- To Acquire measuring skills
- Get fitting practice skills
- To acquire wiring practice skills
- To acquire sheet metal practice skills

Subject	Instruction		Examination			
	Hours/ Week	Hours per Year/ Semester	Marks			Duration
			Internal Assessment	Board Examination	Total	
2009 Workshop Practice	4 Hrs	128 Hrs	25	75	100	3 Hrs.

FITTING PRACTICE — 64 Hours

- General safety precaution inside the Workshop.
- Study about First Aid.
- Study of Hand Tools and measuring Instruments
- Marking and Punching Practice
- Hacksaw cutting Practice
- Filing & Fitting Practice
- Drilling & Tapping Practice

Note: Practices should be given to cover the above area. At the end, the students should be able to do the following exercises for the Board Practical Examinations.

Exercises

1. V - Joint
2. L - Joint
3. T - Joint
4. Half round joint
5. Dovetail Joint
6. U – Joint
7. Hexagonal – Joint
8. Step - Joint
9. Drilling and Tapping M8
10. Drilling and Tapping M10

Note: 70mm X 50mm X 3 mm thick plate can be used for the above joints. All the exercises should be given for the Board Practical Examinations.

WIRING 32 Hours

- Study about the Safety in wiring.
- Study of Hand & Power Tools and Testing tools.
- Study the purpose of earthing.
- Identify all Electrical fittings and Accessories .
- Identify Standard type of wires with Colour codes.
- Identify the symbols used in the circuit diagram.
- Practice the simple wiring methods.
- Soldering Practice.

Exercises

1. Single lamp controlled by single switch.
2. Two Lamps controlled by Two independent switches.
3. Stair case Wiring
4. Fluorescent lamp circuit.
5. Circuit diagram of a fan
6. Circuit diagram of an iron box
7. Circuit diagram of a mixie
8. Soldering practice

Note: Experimental boards should be prepared to trace the circuit diagram. All the exercises should be given for the Board Practical Examination.

SHEET METAL 32 HOURS

- Study about the Safety in sheet metal shop.
- Study of sheet metal Tols and their uses.
- Methods of marking, cutting , hemming, seaming, punching and riveting.
- Development of simple surface
- Fabrication of frames

Exercises

1. Hemming
2. Seaming
3. Tray
4. Cylinder
5. Cone
6. Hopper
7. Dust Pan
8. Funnel

Note: 18g - Sheet to be used for the above Exercises

EXAMINATION EVALUATION

The student should maintain record notebook for all the trades and submit during the Board Practical Examinations.

Practical Examination

	Duration	Max.Marks
Exercises		
Part A		
Fitting (compulsory)	2 Hours	45
Part B		
Wiring/Sheet metal (To be selected by lot)	1 Hour	25
Viva-voce (From Study Experiments)		5
Internal Assessment (Fitting-10 , Sheetmetal-5, Wiring -5 , Attendance-5)		25
Total Marks		**100**

Detailed Allocation

EXERCISES

PART A

Marking & Cutting	20
Dimension & Mating & result	25
Total	**45**

PART B

Marking/Circuit Diagram	10
Dimensions / Connection	10
Finishing / Result	05
Total	**25**

2005 – ENGINEERING GRAPHICS
First Semester and Second Semester

OBJECTIVES

- At the end of the Training programme, the student will be able to state the importance of Engineering Drawing.
- To identify the drawing instruments.
- To practice the methods of dimensioning.
- To construct conics and curves.
- To draw orthographic views from isometric drawings.
- To draw projection of solids.
- To draw sectional views of solids.
- To convert orthographic views to isometric drawings.
- To prepare development of surfaces of objects.
- To prepare engineering drawings using AutoCAD software.
- To state the advantages of AutoCAD software.

SCHEME OF INSTRUCTION AND EXAMINATIONS

Subject	Instruction		Examination			
	Period/ Week	Period/ year	Marks			Duration
			Internal Assessment	Board Examination	Total	
2005 - Engineering Graphics	**6 Hrs.**	**192 Hrs.**	**25**	**75**	**100**	**3 Hrs.**

TOPICS AND ALLOCATION

Sl.No	Topic	Time (Hrs)
Unit-1.1	**Drawing office Practice**	12
	Geometrical Constructions, conics and geometrical curves	12
Unit-2	Orthographic Projections	36
Unit-3	**Projection of Solids and Section of Solids**	36
Unit-4	**Pictorial drawings**	24
Unit-5	Development of surfaces	30
Unit-6	Practice on AutoCAD	30
	Test and Revision	12
Total		**192**

DETAILED SYLLABUS

Unit-1

1. 1. Drawing Office Practice:

1.1.1 Importance of Engineering Drawing as a graphic communication - drawing practice as per BIS code -Drawing Instruments: Drawing Board, Mini Drafter, Drawing Instruments like compass, divider, protractor, drawing sheets etc.

1.1.2 Importance of Legible lettering and numbering - single stroke letters - upper case and lower case letters- general procedures for lettering and numbering-height of letters-guidelines.

1.1.3 Dimensioning - need for dimensioning-terms and notations as per BIS - Dimension line, Extension line and Leader line- methods of placement of dimensions--Importance of dimension rules.

1.1.4 Scales - Study of scales-full size scale, reduced scale and enlarged scale.

12Hrs.

1. 2. Geometrical Constructions, conics and geometrical curves :

1.2.1 Conics : Different types - Explanation of locus, focus and directrix-Application of ellipse, parabola and hyperbola - Ellipse: Construction of ellipse by concentric circle method, rectangular method when major axis and minor axis are given - Parabola: Construction by rectangular method-construction of ellipse, parabola and hyperbola when eccentricity is given.

1.2.2 Geometric curves: Definition, Application and construction of involute, archimedian spiral, helix, cycloid (Circle rolling on a straight line).

12Hrs.

Unit-2

2. Orthographic Projection

Projection of simple objects in three views-exercise in drawing (Half size and Full size) Practice in first angle projection only.

36Hrs.

Unit-3

3. Projection of Solids and Section of Solids

3.1 Projection of simple solids - cube, prism, cylinder, cone and pyramids.

i. Axis perpendicular to one plane and parallel to another plane.
ii. Axis parallel to both planes
iii. Axis parallel to one plane and inclined to another plane.

3.2 Sectional view - need for sectional view-cutting plane-cutting plane line-representation as per I.S. code- hatching-section of simple solids, cube, prism, cylinder, cone with axis vertical, when the cutting plane is
i. Parallel to one plane and perpendicular to other plane
ii. Inclined to one plane and perpendicular to other plane.

36Hrs.

Unit-4

4. Pictorial drawings

4.1 Isometric Drawings - Conversion of orthographic views into isometric drawings.

24Hrs.

Unit-5

5. Development of Surfaces

5.1 Need for preparing development drawing with reference to sheet metal work - Development of cube, cylinder, square and hexagonal prism, square and hexagonal pyramids, frustum of pyramids and cones and pipe connections such as `Tee' and `Elbow'.

30Hrs.

Unit-6

6. Practice on AutoCAD

6.1 AutoCAD commands - Draw commands-line, circle, arc, polygon, ellipse, rectangle-Edit Commands-Dimension commands.

6.2 Exercise: Write the AutoCAD commands for the exercises given below.

30Hrs.

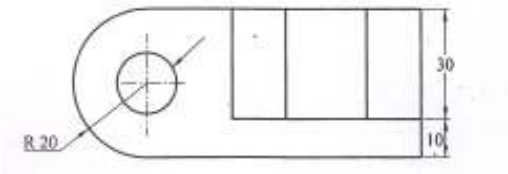


Fig – 1

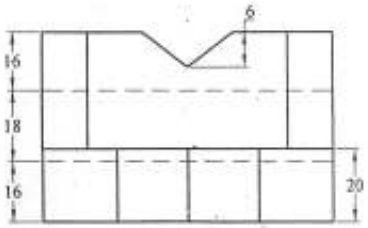


Fig- 2

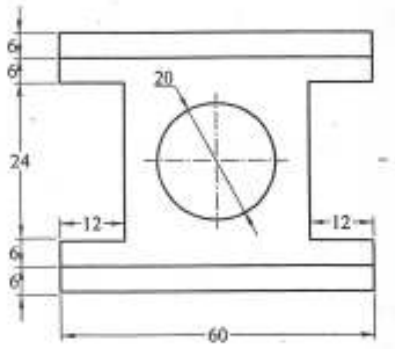


Fig. 3

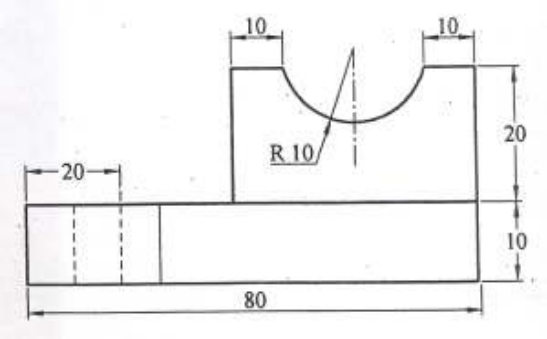


Fig. 4

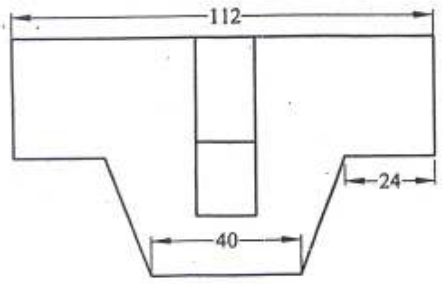


Fig. 5

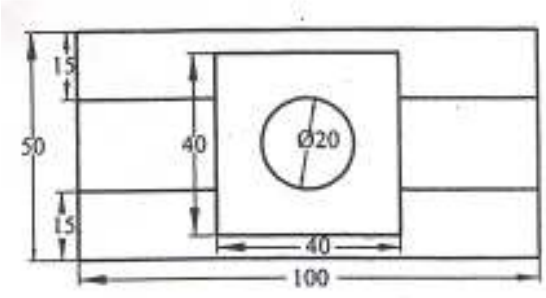


Fig. 6

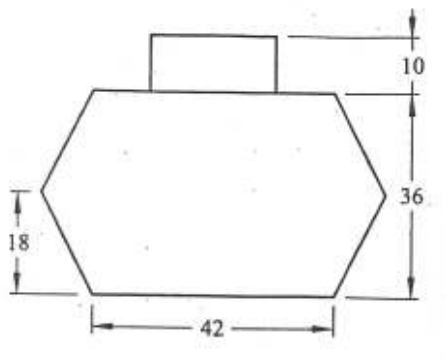


Fig. 7

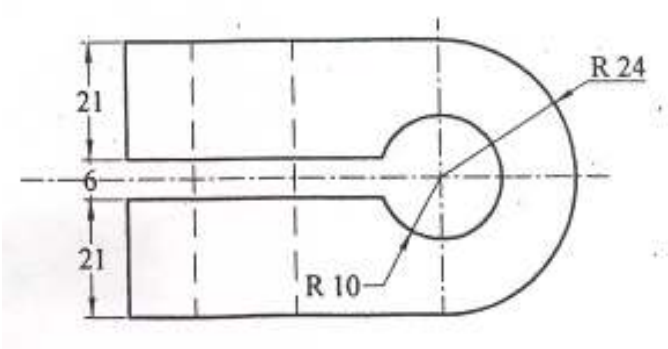


Fig. 8

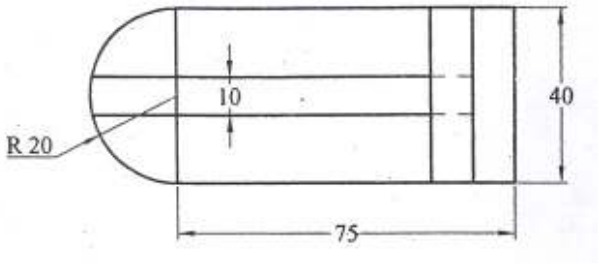


Fig. 9

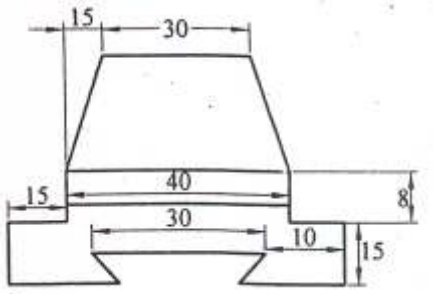


Fig. 10

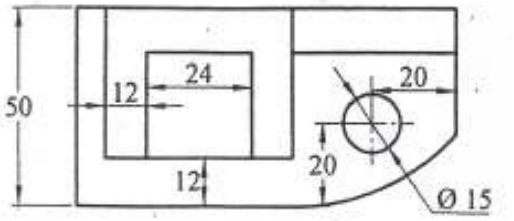


Fig.11

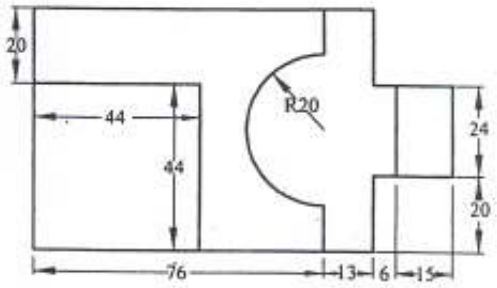


Fig. 12

Test and Revision 12
Hrs.

Examination Evaluation			**Marks**
Internal Assessment Marks			**25**
Attendance	5		
Class work drawings	10		
Class Test	10		
Board Examination (3 hours)			**75**
Part-A (Units 1, 3, 4 & 5) Any three out of four	3 x 10 =	30	
Part-B (Unit 2)	35		
Part-C (Unit 6)	10		
Total			**100**

Reference Book:

1. Gopalakrishnan.K.R., "Engineering Drawing", (Vol.I and Vol.II), Dhanalakshmi publishers, Edition 2, 1970
2. Barkinson & Sinha, "First Year Engineering Drawing" Pitman Publishers, London, Edition 3, 1961
3. Francis Soen, David Pitzer and Howard M.Fulmer, "AutoCAD Release 13 for Windows and Windows NT", Prentice-Hall of India Pvt. Ltd., New Delhi 110 001, Indian Reprint, 1996.

2005 - ENGINEERING GRAPHICS

MODEL QUESTION PAPER - 1

Maximum marks :75
Time :3Hours

[N.B. (1) Answer all questions.
(2) First angle projection is to be followed.
(3) All the questions are to be answered in drawing sheet supplied.
(4) All dimensions are in mm.
(5) Credit will be given for neatness.]

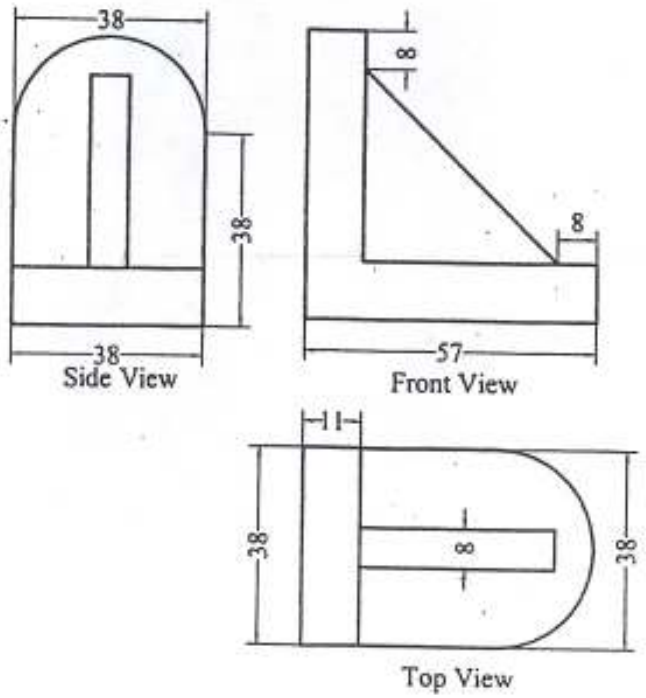
PART-A

[N.B.- Answer any three questions] (3x10=30)

1. A flowerbed in a botanical garden is in elliptical shape with major and minor axis dimensions are 10m and 6m respectively. Draw profile of the flowerbed by concentric circles method.

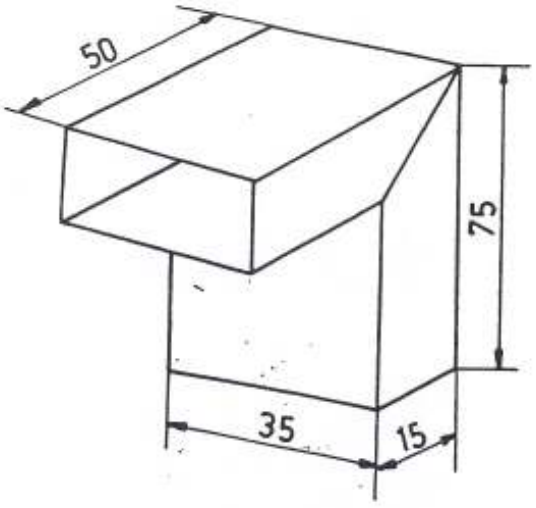
2. A square prism of base 40mm and axis length 80mm rests on the H.P on one of its rectangular faces with its axis inclined at 30° to the VP. Draw its plan and its elevation.

1. Draw the isometric view of the casting, three views of which are shown in fig. 1.



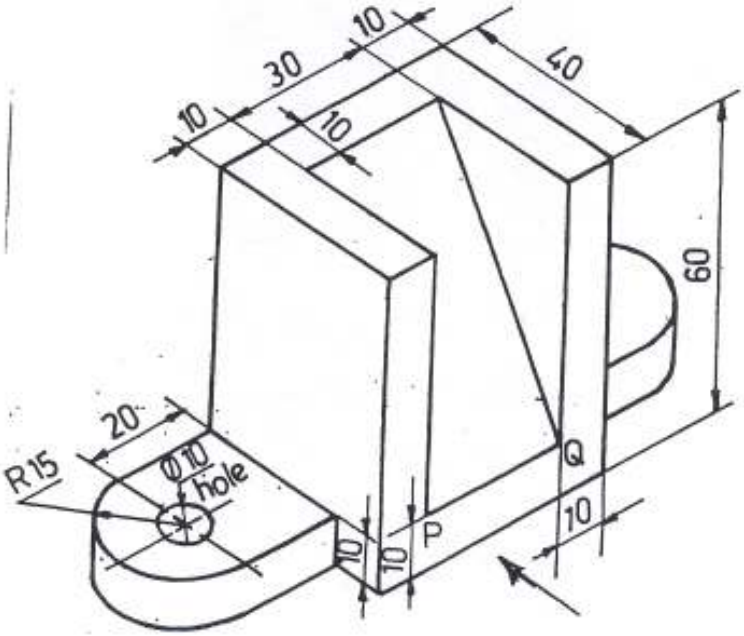
PART-B

2. Draw the development of Duct shown in fig. 2.



The Pictorial view of an object is shown in fig.3. Draw the following views to full size scale. (35)

a) Elevation in the direction of arrow
b) Left side view
c) Plan



PART - C

Write AutoCAD commands to draw fig.4 shown below. (10)

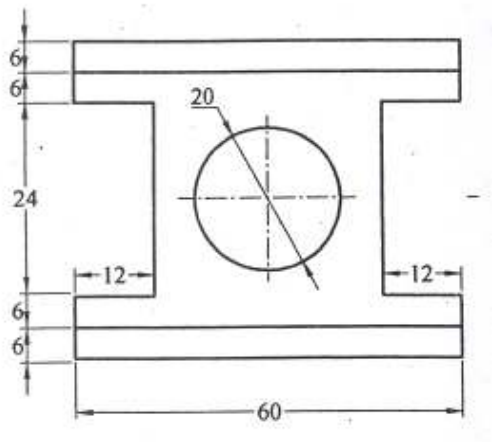


Fig.4

2005 - ENGINEERING GRAPHICS

MODEL QUESTION PAPER - 2

Maximum marks :75
Time :

3Hours

[N.B. (1) Answer all questions.
(2) First angle projection is to be followed.
(3) All the questions are to be answered in drawing sheet supplied.
(4) All dimensions are in mm.
(5) Credit will be given for neatness.]

PART-A

[N.B.- Answer any three questions] (3x10=30)

1. Read the dimensioned drawing shown in fig.1. Redraw the figure to full size and dimension it as per Indian Standards.

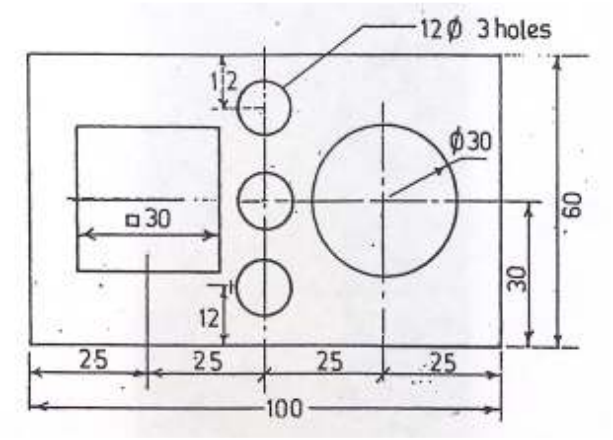
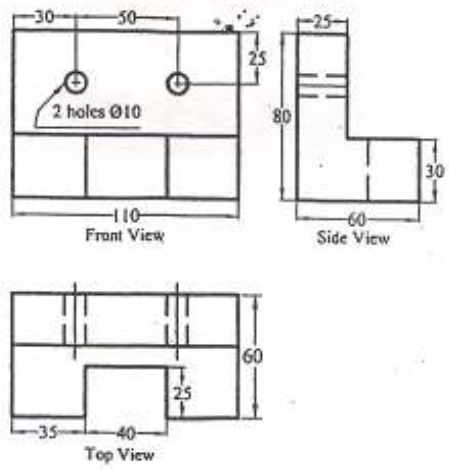


Fig.1

2. A cone diameter of base 35 mm and axis 45mm long is resting on its base on the ground. It is cut by a section plane perpendicular to V.P., parallel to H.P. and 15 mm above the base of the cone. Draw the sectional top view.

3. Draw the isometric view for the orthographic views shown in fig. 2.



4. Draw the development of an elbow shown in fig. 3.

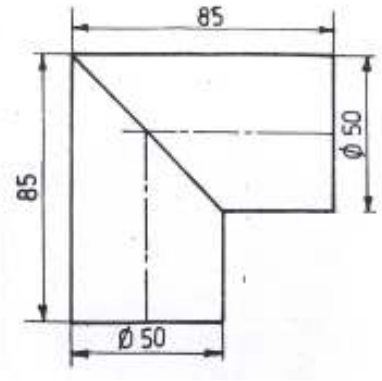
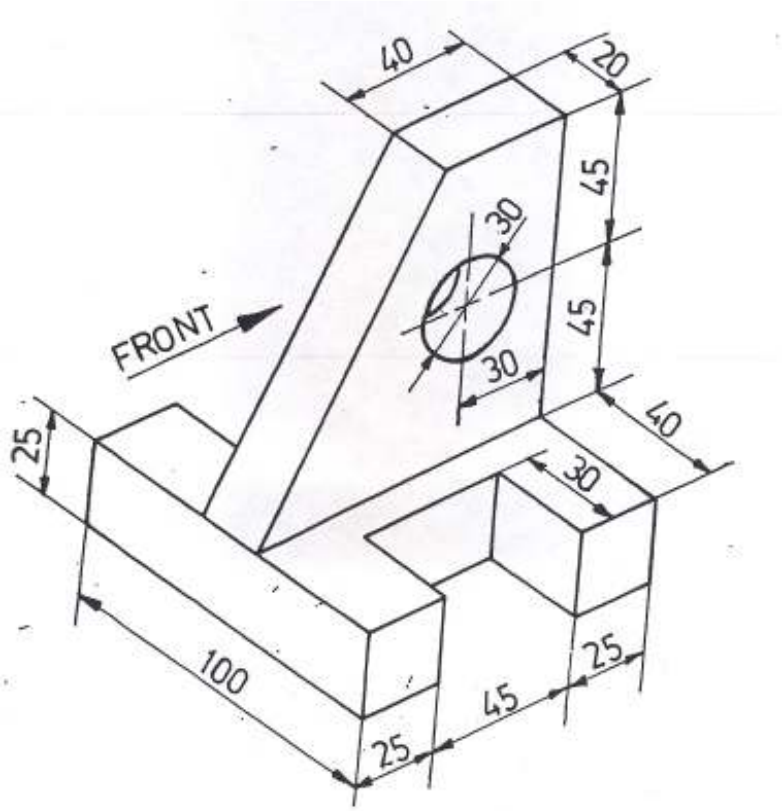


Fig.3

PART-B

The pictorial view of an object is shown in fig.4. Draw the following views to half size scale. (35)

a) Elevation in the direction of arrow
b) Right side view
c) Plan



PART - C

Write AutoCAD commands to draw fig.5 shown below. (10)

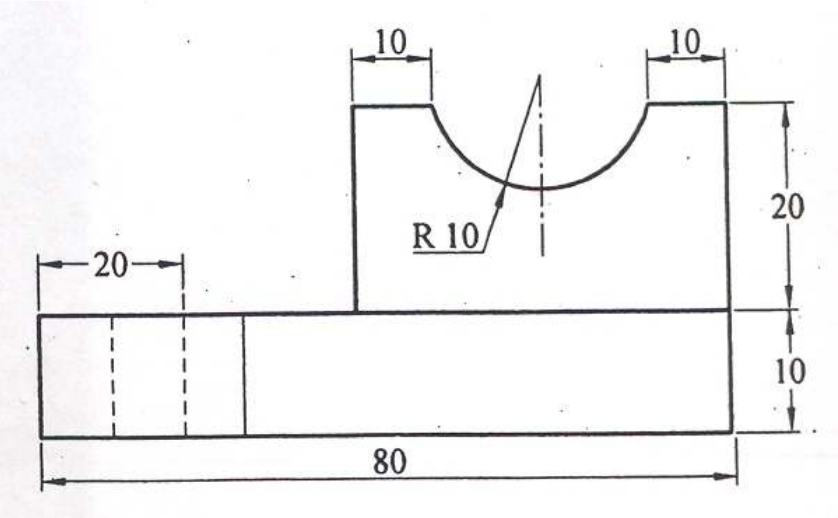


Fig. 5