C24_CURRICULUM

DIPLOMA IN
CIVIL ENGINEERING

OFFEREDBY

STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TELANGANA: HYDERABAD

I SEMESTER

S. NO	Course		Teaching Scheme					Examination Scheme						
			Instruction Periods per week			Total Periods per semester	Credits	Continuous Internal Evaluation (CIE)			Semester End Examination (SEE)			
	Code	Course Name	L	T	P			Mid Sem 1	Mid Sem 2	Internal Evaluation	Max marks	Min marks	Total Marks	Min marks for passing including internal
1	HU-101	Basic English	4	1	0	75	2.5	20	20	20	40	14	100	End Marks shall be ≥35% of Topper Marks and Subject Total Shall be ≥ D-Hybrid Grade Minimum
2	SC-102	Basic Engineering Mathematics	4	1	0	75	2.5	20	20	20	40	14	100	
3	SC-103	Basic Physics	4	1	0	75	2.5	20	20	20	40	14	100	
4	SC-104	General Engineering Chemistry	4	1	0	75	2.5	20	20	20	40	14	100	
5	CE-105	Basic Surveying	4	1	0	75	2.5	20	20	20	40	14	100	
6	CE-106	Building Materials	4	1	0	75	2.5	20	20	20	40	14	100	
7	ME-107	Engineering Drawing-I	1	0	2	45	1.25	20	20	20	40	20	100	End Marks shall be ≥50% of Topper Marks and Subject Total Shall be ≥ D-Hybrid Grade Minimum
8	CE-108	Basic Surveying Lab	1	0	2	45	1.25	20	20	20	40	20	100	
9	SC-109	Basic Science Lab	1	0	2	45	1.25	20	20	20	40	20	100	
10	CS-110	Computer Fundamentals Lab	1	0	2	45	1.25	20	20	20	40	20	100	
			28	6	8	630	20	200	200	200	400	164	1000	

HU-101-BASIC ENGLISH

Course Title	Basic English	Course Code	HU-101
Semester	I	Course Group	Foundation
Teaching Scheme in Minutes (L:T)	3: 2	Credits	2.5
Methodology	Communicative Language Teaching + Assignments	Total Contact Hours	75
CIE	60 Marks	SEE	40 Marks

Prerequisites: Basic knowledge of English Language

COURSE CONTENTS

MODULE 1: VOCABULARY THROUGH READING - I

Duration: 15 Periods (L 9 P 6)

1. How to Learn a New Word

    a. Spelling, pronunciation, syllabification, word class, inflections and the other forms of the word
    b. Meanings, usage, derivatives, phrasal verbs, idiomatic expressions and context for using the word
    c. Compound words, etymology, synonyms, antonyms and collocations.

2. Synonyms, Antonyms and One-Word Substitutes
3. Reading – I

    a. Purpose of Reading
    b. Types of Reading
    c. Types of Paragraphs and Questions (Factual, Inferential, Vocabulary-based and Experiential)

4. Reading – II

    Passages on Innovation, Science and Technology, History, Biography, Travel Writing, Nature Writing, Journal, Story, Process, Cause and Effect, Problem Solution, Evaluation of ideas, Reasons and Conclusion, etc.

MODULE 2: SPEAKING - 1

Duration: 10 Periods (L 6 P 4)

1. Need for English
2. Classroom English
3. Expressing Likes and Dislikes
4. Expressing Feelings

MODULE 3: GRAMMAR - I

Duration: 15 Periods (L 9 P 6)

1. Basic Sentence Structures
2. Tenses-I
3. Tenses-II
4. Voice

MODULE 4: SPEAKING – II

Duration: 10 Periods (L 6 P 4)

1. Introducing Oneself
2. Talking about daily routine
3. Fixing, Cancelling and Rescheduling Appointments
4. Extending, Accepting and Declining Invitations

MODULE 5: GRAMMAR - II

Duration: 15 Periods (L 9 P 6)

1. Adjectives
2. Prepositions
3. Asking Questions –I
4. Asking Questions - II

MODULE 6: WRITING - I

Duration: 10 Periods (L 6 P 4)

1. Paragraph Writing – I
2. Paragraph Writing – II
3. Letter Writing – I
4. Letter Writing – II

COURSE OUTCOMES

COs	At the end of the course, the students will have the ability to:
CO 1	Apply newly acquired vocabulary in contextually relevant scenarios, analyze provided passages for comprehension and formulate responses accordingly.
CO 2	Recall the uses of English, construct the frequently used sentences in classroom and express their likes, dislikes and feelings in different contexts.
CO 3	Construct various forms of sentence structures correctly and use different forms of tenses and suitable voice in various contexts.
CO 4	Introduce oneself, discuss one's daily routine, fix appointments and extend invitations.
CO 5	Describe objects using suitable adjectives, select the appropriate prepositions for different contexts and ask dichotomous and informative questions.
CO 6	Convey ideas in the form of paragraphs and compose formal and informal letters.

CO-PO Matrix

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	Mapping POs
CO 1	-	-	-	-	2	2	2	5, 6 and 7
CO 2	-	-	-	-	2	2	2	5, 6 and 7
CO 3	-	-	-	-	1	3	2	5, 6 and 7
CO 4	-	-	-	-	2	2	3	5, 6 and 7
CO 5	-	-	-	-	1	2	3	5, 6 and 7
CO 6	-	-	-	-	2	2	3	5, 6 and 7

CONTINUOUS INTERNAL EVALUATION (CIE)

Test	Modules	Marks	Pattern
Mid - I	1. Vocabulary Through Reading - I 2. Speaking- I	20	Part A: 4 short answer questions Part B: 2 short essay questions with internal choice Part C: 2 essay questions with internal choice
Mid - II	1. Grammar – I 2. Speaking- II	20	Part A: 4 short answer questions Part B: 2 short essay questions with internal choice Part C: 2 essay questions with internal choice
Slip Test - I	1. Vocabulary Through Reading - I 2. Speaking- I	5	2 questions out of 3 questions
Slip Test - II	1. Grammar – I 2. Speaking- II	5	2 questions out of 3 questions
Assignment	One assignment per one semester	5	Different assignments of higher order questions that develop problem solving skills and critical thinking should be given
Seminars	One seminar per one semester	5	Oral presentations using audio–visual equipment, charts, etc.
	Total	**60**	

SEMESTER END EXAMINATION

SEMESTER END EXAM							
Sl. NO.	Module	Question to be set for SEE					Remarks
		R			U	A	
1	I	4	1		9 (a)	13 (a)	
2	II						
3	III		2		10 (a)	14 (a)	
4	IV						
5	V		3	5, 6	9 (b)	13 (b)	
					11 (a)	15 (a)	
					11 (b)	15 (b)	
6	VI			7ssssss, 8	10 (b)	14 (b)	
					12 (a)	16 (a)	
					12 (b)	16 (b)	
Total Questions		8			8	8	

Legend:

Remembering: **One mark**
Understanding: **Three marks**
Application: **Five marks**

Suggested Student Activities:

- Practice conversation / dialogue / speech and answer the questions.
- Seminars.
- Review a movie.
- Narrate a story.
- Prepare chain stories.
- Vocabulary building games.
- Speak about incidents /events /memories /dreams/role model.
- Interviews of famous personalities.
- Collect the biographies of unsung heroes.
- Reading for main ideas and specific details.
- Describe pictures.
- Collect the letters written by famous persons and analyze them.
- Describing a process.
- Give directions using maps.

REFERENCES:

1. High School English Grammar & Composition by Wren & Martin
2. Practical English Grammar by A.J Thomson and A.V. Martinet
3. A Course in Phonetics and Spoken English by J. Sethi and P.V Dhamija
4. Word Power Made Easy by Norman Lewis.
5. Essential English Grammar by Raymond Murphy.
6. Spoken English-A Self Learning Guide to Conversation Practice by V. Sasi Kumar.

BOARD DIPLOMA EXAMINATION (C-24)

MID SEMESTER EXAMINATION -I

HU-101 BASIC ENGLISH

Time: One Hour **Total Marks: 20**

PART - A **1 X 4 = 4 Marks**

Instructions: a) Answer all the questions. b) Each question carries one mark.

1. Write a sentence each using the following words.
   a. Report
   b. Illustrate
2. Find one-word substitute for the following one.
   A person who always looks at the brighter side of life.
3. Describe two qualities you dislike in your neighbour.
4. Write how you feel if you get selected for your college cricket team.

PART – B **2 X 3 = 6 Marks**

Instructions: a) Answer the following questions. b) Each question carries three marks.

5. a) Read the following passage and answer the questions given below:

A dictionary serves as an efficient tool and forms the important reference material as a part of language learning. It provides spelling, pronunciation, stress and different connotations of the words in different contexts. Some dictionaries give etymology and word formation. A dictionary can be general or specialized, translating or giving lexical meanings within a single language. Dictionaries can assist the learning of vocabulary and is especially of great help to students who are learning a language.

a) What do dictionaries generally provide?

b) Find a synonym for 'origin of a word' from the passage.

c) How do dictionaries assist in learning a language?

(OR)

b) Discuss any six ways of learning new vocabulary.

6. a) Explain any three problems one might face while learning English and suggest solutions to each of them.

(OR)

b) Express any three features you like and three features you dislike in your hostel.

PART – C **2 X 5 = 10 Marks**

Instructions: a) Answer the following questions. b) Each question carries five marks.

7. a) Read the following passage and answer the questions given below it**.**

Dreams have always held a universal fascination. Some primitive societies believe that the soul leaves the body and visits the scene of the dream. Generally, dreams are accepted to be illusions, having much in common with day-dreams, the fantasies of our waking life. When dreaming, one tends to believe fully in the reality of the dream world, however inconsistent, illogical, and odd it may be. Although most dreams apparently happen spontaneously, dream activity may be provoked by external influences.

'Suffocation' dreams are connected with the breathing difficulties of a heavy cold, for instance. Internal disorders such as indigestion can cause vivid dreams, and dreams of racing fire-engines may be caused by the ringing of an alarm bell. Experiments have been carried out to investigate the connection between deliberately inflicted pain and dreaming. For example, a sleeper pricked with a pin perhaps dreams of fighting a battle and receiving a severe sword wound. Although the dream is stimulated by physical discomfort, the actual events of the dream depend on the associations of the discomfort in the mind of the sleeper.

a). What may be the cause for the dream of racing fire-engines?
b). What was the belief of primitive societies about the dreams?
c). What happens when one is dreaming?
d). Find a suitable word in the passage for the following phrases. "inability to breathe or feeling uncomfortable due to less air"
e). What could be the actual reasons for getting dreams?

(OR)

b) Explain any five features of a new word that you wish to learn with the help of a dictionary. Give an example of each of those features.

8. a) Identify any ten problems that you face while learning English.

(OR)

b) Express any ten common sentences used by the teacher in the classroom.

BOARD DIPLOMA EXAMINATION (C-24)

MID SEMESTER EXAMINATION -II

HU-101 BASIC ENGLISH

Time: One Hour **Total Marks: 20**

PART - A **1 X 4 = 4 Marks**

Instructions: ***a) Answer all the questions.***

b) Each question carries one mark.

1. Write a sentence for the following sentence structure.
   a) S + V
2. Change the following sentence into passive voice.
   a) Pranav ate a mango.
3. Write a sentence for fixing an appointment with a general physician.
4. How do you invite your friend to play cricket with your team.

PART-B **2 X 3 = 6 Marks**

Instructions: ***a) Answer all the questions.***

b) Each question carries three marks.

5. a) Fill in the blanks with the suitable verb forms:
   i) My father _____(watch) TV when I entered house.
   ii) Jahnavi _____ (go) to railway station before I went home.
   iii) My brother _____(be) a good cricket player.

(OR)

5. b) Change the following sentences into passive voice.
   a) He plays cricket
   b) Ramya has bought vegetables.
   c) Balu is singing songs.
6. a) You have recently joined the cricket academy. Introduce yourself to your new friends.

(OR)

6. b) You have an appointment with a general surgeon. Cancel the appointment with the doctor as you are suffering from fever.

PART-C **2 X 3 = 6 Marks**

Instructions: ***a) Answer all the questions.***

b) Each question carries five marks.

7. a) Fill in the blanks with the suitable verb forms:

i) My father _____(go) for a walk every day.

ii) My sister _____ (buy) a book yesterday.

iii) My brother _____(play) cricket for three hours.

iv) The starts _____(be) bright.

v) I _____(finish) my homework just now.

(OR)

7. b) Write a sentence each for the following sentence structures.

a) S + V + SC

b) S + V + O

c) S + V + O + O C

d) S + V

e) S + V + D O + I O

8. a) Write about your daily routine in 10 sentences.

(OR)

8. b) Your brother's wedding is fixed. Extend the invitation to your favorite teacher. Write a conversation between you and your teacher.

BOARD DIPLOMA END EXAMINATION (C-24)

SEMESTER END EXAMINATION

HU-101 BASIC ENGLISH

Time: Two Hours **Total Marks: 40**

PART-A **1 X 8 = 8 Marks**

Instructions: ***a) Answer all the questions.***

b) Each question carries one mark.

1. Write an antonym for the underlined word in the following sentence.
   a) Ramya is a <u>generous</u> person who supported many charities for over 20 years.
2. Write a sentence using the following sentence structure.
   a) S + V + O
3. Make 'Yes/No' question using the following statement.
   a) He has come to college today.
4. A student does not know the meaning of a difficult word. How does he / she ask the teacher?
5. Fill in the blank with a suitable preposition.
   a) He came to college _____ foot.
6. Identify the adjectives in the following sentences.
   a) Srinivas has a costly watch.
   b) Pavani sold a small bag to Radha.
7. Write any two salutations generally used in the formal letter.
8. Identify the central idea of the following paragraph.

   An anecdote is a quick story about something of interest, usually with a singular theme or lesson. Anecdotes are no different than the stories told among friends, but when they're used in literature, they can accomplish more than merely passing the time.

PART-B **3 X 4 = 12 Marks**

Instructions: ***a) Answer all the questions.***

b) Each question carries three marks.

9. a) How do you feel in the following situations?

i. India won the cricket world cup.

ii. Your friend's grandmother passed away yesterday

iii. Your sister did not return from college until late evening.

(OR)

b) Describe your friend using six suitable adjectives.

10. a) Change the following sentences into passive voice.

i. Bees make honey.

ii. Prasad stole my calculator.

iii. I will complete my assignment tomorrow.

(OR)

b) Write a paragraph on your polytechnic in 50 words.

11. a) Change the following sentences into 'Wh' questions using the hints given in brackets

i. I bought a camera yesterday. (Use 'what')

ii. He was born in Sircilla on 28th December, 2002 (Use 'when')

iii. He went to Hyderabad to buy books. (Use 'why').

(OR)

b) Fill in the blanks with suitable prepositions.

i. He is suffering _____fever.

ii. His grandmother died _____ Covid-19.

iii. He is good_____ mathematics.

12. a) Write a letter to your Principal requesting him / her to permit you to participate in the National seminar to be conducted in New Delhi.

(OR)

b) Write a paragraph in 50 words about your fresher's day party.

PART-C **4 X 5 = 20 Marks**

Instructions: a) Answer all the questions. b) Each question FIVE mark.

13. a) Write any of the five aspects of learning a new word.

(OR)

b) Read the following passage and answer the questions given below.

I just returned from the greatest summer vacation. It was so fantastic. I never wanted it to end. I spent eight days in Paris. My best friends, Harish and Umesh came with me. We had a beautiful hotel room in the Latin Quarter, and it wasn't even expensive. We had a balcony with a wonderful view.

We visited many famous tourist places. My favorite was the Louvre, a well-known museum. I was always interested in art, so that was a special treat for me. The museum is so huge; you could spend weeks there. Harish got tired walking around the museum and said "Enough! I need to take a break and rest."

We took lots of breaks and sat in cafes along the river Seine. The French food we ate was delicious. The fruits were tasty too. Umesh's favorite part of the vacation was the hotel breakfast. He said he would be happy if he could eat tartines like those forever. We had so much fun that we're already talking about our next vacation!

a) Which city did they visit for summer vacation?
b) How long was the summer vacation?
c) What did their hotel room have?
d) Who got tired walking in the Louvre Museum?
e) What did Umesh enjoy the most?

14. a) Write your mother's daily routine in 100 words.

(OR)

b) Write a letter to the newspaper editor about the problem of street dogs in your colony.

15. a) Frame two ‘Yes/No’ questions and three ‘Wh’ questions from the following passage.

For a year Gopal Krishna Gokhale studied in the Deccan College, Poona. Then he went to Elphinstone College, Bombay, for his final B.A. There he took mathematics as an optional subject and eventually became interested in it. He came under the influence of a distinguished English professor who further quickened his interest in his studies. Under this professor’s guidance he made so much progress that he gained a scholarship of twenty rupees a month. It was not a small sum for him who had always been poor. The scholarship was a veritable boon to him made him very happy.

In 1884 he took his B.A. in the second division. He then joined the College of Science and Engineering at Poona. A short time after doing so, he learnt that he could study law in the Deccan College. But he did not know how to do it, because he wanted to earn his living while he was a student. Soon an opening offered itself to him. He was appointed a teacher in the New English School, Poona, on thirty-five rupees a month. He made up his mind to take the law course while working as a teacher.

(OR)

b) Describe your mobile phone using at least ten adjectives in 100 words.

16. a) Write a paragraph on different types of pollution in 100 words.

(OR)

b) Write a letter to your school friend sharing your experiences at your polytechnic.

SC-102-BASIC ENGINEERING MATHEMATICS

Course Title	Basic Engineering Mathematics	Course Code	SC-102
Semester	I	Course Group	Foundation
Teaching Scheme in Periods (L : T : P)	4:1:0	Credits	2.5
Methodology	Lecture + Tutorial	Total Contact Periods	75
CIE	60 Marks	SEE	40 Marks

Pre requisites:
This course requires the basic knowledge of Algebra, Trigonometry in Mathematics at Secondary school level

Course Outcomes (COs):
At the end of the course, the student will have the ability to:

CO 1	Solve the problems using concepts of Logarithms and Partial fractions.
CO 2	Determine the Inverse of a square matrix using Algebra of Matrices and Determinants.
CO 3	Solve the problems using the concept of Trigonometric ratios of Allied and Compound angles
CO 4	Solve the problems using the concepts of Multiple and sub-multiple angles; and Transform sum or difference of Trigonometric ratios into products and vice versa.
CO 5	Solve the engineering problems involving Inverse Trigonometric functions and understand the Properties of Triangles.
CO 6	Solve the triangle ABC to Apply the Properties of triangles; and solve the system of linear equations that arise in various engineering problems using the concept of Matrices and Determinant

Course Content:

Unit – I Algebra: **Duration: 10 Periods (L: 08– T: 02)**

Logarithms: Definition of Logarithm and its properties - Natural and Common Logarithms - Meaning of *e* - Exponential functions - Logarithm as a function and its graphical representation – Solve simple Problems related to Logarithms.

Partial Fractions: Rational, Proper and Improper fractions of polynomials- Reduction of Improper fractions into Proper fractions of polynomials - Resolving Rational fractions into their Partial fractions covering the types mentioned below:

(i) $\frac{f(x)}{(x\pm a)(x\pm b)}, a \neq b$; (ii) $\frac{f(x)}{(x\pm a)(x\pm b)(x\pm c)}, a \neq b \neq c$;

(iii) $\frac{f(x)}{(x\pm a)^2}$; (iv) $\frac{f(x)}{(x\pm a)^2(x\pm b)}, a \neq b$;

(v) $\frac{f(x)}{(x\pm a)(x^2\pm bx\pm c)}$, where a, b, and c, are constants and($x^2 \pm bx \pm c$) cannot be factorised.

Unit – II Matrices and Determinants: Duration: 15Periods (L: 12 – T:03)

Matrices: Definition of Matrix-order Of Matrix-Type of Matrices with examples - Algebra of matrices: sum, difference, scalar multiplication and product of Matrices - Equality of two matrices- Properties of Algebra of Matrices - Transpose of a Matrix-Symmetric and Skew-Symmetric Matrices.

Determinants: Determinant of a square Matrix of order 2 × 2 - Determinant of a square Matrix of order 3 × 3 by using Laplace's expansion -Properties of Determinants -Singular and non-singular Matrices- Minor and cofactor of an element of a square matrix - Adjoint of a square matrix- Multiplicative inverse of a square matrix.

Unit-III Trigonometry – I Duration: 12Periods (L: 10 – T: 02)

Trigonometric Ratios of Allied Angles: Angle measurement- Relation between Degree and Radian-Notational conversions- Trigonometric Ratios-Trigonometric identities (statements only)-Signs of Trigonometric Ratios in different quadrants - Trigonometric Ratios of standard Allied angles- Related problems.

Compound Angles: Definition of Compound angles -Trigonometric Ratios of Compound angles (without proof) and identities - Related problems.

Unit-IV Trigonometry – II Duration:13 Periods (L: 10 – T: 03)

Multiple and sub-multiple angles: Trigonometric Ratios of Multiple angles 2A and3A - Trigonometric Ratios of Sub-multiple angle ($\frac{A}{2}$)- Related identities and problems.

Transformations: Transformation of products into sums or differences and vice versa - Trigonometric identities under the conditions (A + B + C) = 90^0 and (A + B + C) = 180^0 -Related problems only

Unit – V Trigonometry – III **Duration: 12Periods (L: 10– T: 02)**

Inverse Trigonometric Functions: Basic concepts of Inverse Trigonometric functions along with their domains and ranges -Properties of inverse Trigonometric functions and identities - Related problems.

Properties of Triangles: Elements of a Triangle -Sine rule -Cosine rule - Projection rule - The law of tangents -Related problems.

Unit - VI Applications of Trigonometry and Matrices:

Duration: 13Periods (L: 10– T:03)

Solutions of Triangles: Solutions of triangles in the following cases: (i) when three sides (SSS) (ii) when two sides and an included angle (SAS) and (iii) when one side and two angles (SAA) are given..-Simple problems

Solutions of system of Simultaneous Linear Equations using Matrices and Determinants: Solutions of system of simultaneous two linear equations in two unknown variables and three linear equations in three unknown variables by using Cramer's rule and Matrix Inversion Method -Elementary Row operations - Solutions of system of three simultaneous linear equations in three unknown variables by using Gauss-Jordan Method.

Reference Books:

1. Text Book of Matrices – by Shanti Narayan and Dr. P. K. Mittal.
2. Plane Trigonometry - by S.L.Loney.
3. NCERT Mathematics Text Books of Class XI, XII (Part – I).
4. Intermediate Mathematics Text Book I A (Telugu Academy).

Suggested E-Learning references:

1.https://www.khanacademy.org/
2. https://www.wolframalpha.com/
3. https://onlinecourses.nptel.ac.in/
4. http://tutorial.math.lamar.edu/

Suggested Learning Outcomes:

At the end of the course, the student will have the ability to:

CO1: Solve the problems using concepts of Logarithms and Partial fractions.

1.1 Define Logarithm.

1.2 Distinguish Natural Logarithms and Common Logarithms.

1.3 State Properties of Logarithms.

1.4 Explain the meaning of *e* and Exponential functions.

1.5 Define Logarithm as a function and explain its graphical representation.

1.6 Simplify Logarithmic expressions in engineering problems by using Properties of Logarithms.

1.7 Solve Logarithmic Equations by using Properties of Logarithms.

1.8 Define the Rational fraction of polynomials with examples.

1.9 Classify Rational fractions of polynomials

1.10 Define Proper rational fraction of polynomials with examples.

1.11 Define Improper rational fraction of polynomials with examples.

1.12 Reduce Improper rational fractions into the Proper rational fractions by using division method.

1.13 Resolve Rational fractions of the type: $\frac{f(x)}{(x\pm a)(x\pm b)}$ into Partial fractions, where a and b are Constants with $a \neq b$.

1.14 Resolve Rational fractions of the type: $\frac{f(x)}{(x\pm a)(x\pm b)(x\pm c)}$ into Partial fractions, where a, b and c are constants with $a \neq b \neq c$.

1.15 Resolve Rational fractions of the type: $\frac{f(x)}{(x\pm a)^2}$ into Partial fractions, where a is constant

1.16 Resolve Rational fractions of the type: $\frac{f(x)}{(x-a)^2(x-b)}$ into Partial fractions, where a and b are constants with $a \neq b$.

1.17 Resolve Rational fractions of the type: $\frac{f(x)}{(x\pm a)(x^2\pm bx\pm c)}$ into Partial fractions, where a, b And c are constants and ($x^2 \pm bx \pm c$) cannot be factorised further.

CO2: Determine the Inverse of a square matrix using Algebra of Matrices and Determinants.

2.1 Define Matrix.

2.2 Classify the types of Matrices with examples.

2.3 Define Equality of two Matrices

2.4 Compute the sum of two Matrices.

2.5 Compute the difference of two Matrices.

2. 6 Compute the scalar multiplication of a Matrix.

2.7 Compute the product of two Matrices.

2.8 State the properties of Algebra of Matrices such as Commutative, Associative, Identity and Distributive properties with examples and counter examples.

2.9 Define Transpose of a Matrix and write its properties.

2.10 Define Symmetric and Skew-symmetric Matrices with examples.

2.11 Resolve a Square Matrix into a sum of Symmetric and Skew- symmetric Matrices with examples.

2.12 Expand the Determinant of a square of order 2×2.

2.13 Expand the Determinant of a square of order 3×3 using Laplace's expansion.

2.14 State the Properties of Determinants.

2.15 Apply the Properties of Determinants to solve the problems.

2.16 Distinguish Singular and Non-singular Matrices.

2.17 Define minor and co-factor of an element of square Matrices of orders 2×2 and 3×3 with examples.

2.18 Compute Adjoint of a square Matrices of orders 2×2 and 3×3.

2.19 Compute multiplicative inverse of non-singular square matrices of orders 2×2 and 3×3.

CO3: Solve the problems using the concept of Trigonometric ratios of Allied and Compound angles

3.1 Define Trigonometric ratios.

3.2 State Trigonometric identities.

3.3 Define Degree measure and Radian measure.

3.4 State the relation between Degree and Radian.

3.5 Convert Degree into Radian and vice-versa and related problems.

3.6 State signs of the Trigonometric ratios in different quadrants.

3.7 Formulate Trigonometric ratios of standard Allied angles i.e.($90^0 \pm \Theta$), ($180^0 \pm \Theta$),($270^0 \pm \Theta$), ($360^0 \pm \Theta$) and ($-\Theta$).

3.8 Solve the problems on Trigonometric ratios of Allied angles.

3.9 State the Trigonometric ratios of compound angles i.e. Sin (A±B), Cos (A±B), Tan (A±B) And Cot (A±B)).

3.10 Derive the identities i.e., sin (A+B). sin (A – B) = $\sin^2 A - \sin^2 B$, etc.,).

3.11 Calculate the values of $\text{Sin}15^0$, $\text{Cos}15^0$,$\text{Tan}\ 15^0$,$\text{Sin}75^0$, $\text{Cos}75^0$, $\text{Tan}75^0$ etc., by using 3.9

3.12 Solve the problems by applying 3.9 and 3.10.

CO4: Solve the problems using the concepts of Multiple and sub-multiple angles; and Transform sum or difference of Trigonometric ratios into products and vice versa.

4.1 Derive the formulae for Trigonometric ratios of multiple angles 2A and 3A.

4.2 Derive the formulae for Trigonometric ratios of sub multiple angle $\frac{A}{2}$.

4.3 Derive useful identities i.e. $\sin^2 A = \left(\frac{1-\cos 2A}{2}\right)$, $\cos^2 A = \left(\frac{1+\cos 2A}{2}\right)$ etc..

4.4 Solve the problems by using 4.1, 4.2 and 4.3

4.5 Derive the formulae on transforming sum or difference of two Trigonometric ratios into a product and vice versa.

4.6 Solve the problems by applying 4.5.

4.7 Prove the Trigonometric identities under the conditions
(A + B + C) = $90^0$and (A + B + C) = 180^0.only

CO5: Solve the engineering problems involving Inverse Trigonometric functions and understand the Properties of Triangles.

5.1 Explain the concept of the inverse Trigonometric function by selecting their domains and ranges

5.2 List the Inverse Trigonometric functions along with domain and range.

5.3 State the properties of Inverse Trigonometric functions.

5.4 Derive the Inverse Trigonometric identities i.e. $\sin^{-1}x+\cos^{-1}x = \frac{\pi}{2}$ etc

5.6 Derive formulae like $\tan^{-1}(x)+\tan^{-1}(y) = \tan^{-1}(\frac{x+y}{1-xy})$ where $x\geq 0$, $y\geq 0$, $xy<1$ etc.,

5.5 Solve the simple problems

5.6 List the elements of a triangle.

5.7 Explain the Sine rule, Cosine rule, Projection rule and the law of tangents.

5.8 Solve the problems using 5.7

CO6: Solve the triangle ABC to Apply the Properties of triangles; and solve the system of linear equations that arise in various engineering problems using the concept of Matrices and Determinant.

6.1 Solve the Triangle ABC, when three sides are given.

6.2 Solve the Triangle ABC, when two sides and an included angles are given.

6.3 Solve the Triangle ABC, when one side and two angles are given.

6.4 Solve the system of two linear equations in two unknown variables using Cramer's rule.

6.5 Solve the system of three linear equations in three unknown variables using Cramer's rule.

6.6 Solve the system of two linear equations in two unknown variables using Matrix Inversion Method

6.7 Solve the system of three linear equations in three unknown variables using Matrix Inversion Method.

6.8 State elementary row operations.

6.9 Solve the system of three linear equations in three unknowns by Gauss- Jordan Method.

Suggested Student Activities:

1. Student visits Library to refer Standard Books on Mathematics and collect related material.
2. Quiz
3. Group discussion
4. Group Tests
5. Formulae Tests
6. Surprise tests
7. Seminars
8. Home Assignments.
9. Mathematics- for preparing competitive exams and solve some arithmetical ability exam questions

CO / PO - MAPPING

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	Mapped POs
CO1	3	2					3	1, 2 ,7
CO2	3	2					3	1, 2 ,7
CO3	3	2					3	1, 2 ,7
CO4	3	2					3	1, 2 ,7
CO5	3	2	2				3	1, 2 ,3,7
CO6	3	2	2				3	1, 2, 3, 7

Semester End Examination

<table>
<tr><td rowspan="2">Unit No</td><td colspan="4">Questions to be set for SEE</td></tr>
<tr><td colspan="3">R</td><td>U</td><td>A</td></tr>
<tr><td>I</td><td rowspan="6">4</td><td colspan="2" rowspan="2">1</td><td rowspan="2">9(a)</td><td rowspan="2">13(a)</td></tr>
<tr><td>II</td></tr>
<tr><td>III</td><td colspan="2" rowspan="2">2</td><td rowspan="2">10(a)</td><td rowspan="2">14(a)</td></tr>
<tr><td>IV</td></tr>
<tr><td>V</td><td rowspan="2">3</td><td>5,6</td><td>9(b),
11(a), 11(b)</td><td>13(b),
15(a), 15(b)</td></tr>
<tr><td>VI</td><td>7,8</td><td>10(b),
12(a), 12(b)</td><td>14(b),
16(a), 16(b)</td></tr>
<tr><td>Total Questions</td><td colspan="3">8</td><td>8</td><td>8</td></tr>
</table>

STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TELANGANA

DIPLOMA EXAMINATIONS (C - 24)

SC-102

SEMESTER I, MID – I EXAM, MODEL PAPER

BASIC ENGINEERING MATHEMATICS

Duration: 1: 00 Hour **Max. Marks: 20**

PART-A 04 × 01 = 04

Instructions: 1. Answer **ALL** questions.
2 Each question carries **ONE** mark.

1. Write $log\ 21 + log\ 5$as a single Logarithm.
2. Define Proper fraction.
3. If I=$\begin{pmatrix} -1 & 0 \\ 0 & -1 \end{pmatrix}$then find I^2.
4. If $A = \begin{pmatrix} sin\,\theta & cos\,\theta \\ -cos\,\theta & sin\,\theta \end{pmatrix}$, then find the value of $|A|$.

PART-B 02 ×03 = 06

Instructions: 1. Answer All questions.
2. Each question carries **THREE** marks.

5(a) Find the value of$log_{\frac{1}{3}}\left(\frac{1}{9}\right)$.

OR

5(b) If $\frac{3x-1}{(x-2)(x-3)} = \frac{-5}{(x-2)} + \frac{A}{(x-3)}$, then find the value of *A*.

6(a) If$A = \begin{pmatrix} 2 & 3 \\ 4 & 1 \end{pmatrix}$, then find AA^T.

OR

6(b) If $\begin{vmatrix} 4 & 3 & P \\ 5 & 3 & 1 \\ 2 & 1 & 6 \end{vmatrix} = 0$, then find the value of "*P*".

PART C

Instructions: 1. Answer All questions 02 × 05 = 10

2. Each question carries **FIVE** marks

7(a) Resolve $\frac{2x}{(x+1)(x^2+1)}$ into Partial fractions.

OR

7(b) Find the value of *x*, if $log_4(x) + log_4(x-12) = 3$.

8(a) If $A = \begin{pmatrix} 1 & 2 & -1 \\ 3 & 0 & 2 \\ 4 & 5 & 0 \end{pmatrix}$ and B $= \begin{pmatrix} 1 & 0 & 0 \\ 2 & 1 & 0 \\ 0 & 1 & 3 \end{pmatrix}$, then verify that $(AB)^T = B^T A^T$.

OR

8(b) Find the inverse matrix of $A = \begin{pmatrix} 1 & 3 & 3 \\ 1 & 4 & 3 \\ 1 & 3 & 4 \end{pmatrix}$.

STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TELANGANA

DIPLOMA EXAMINATIONS (C - 24)

SC-102

SEMESTER I, MID – II EXAM, MODEL PAPER

BASIC ENGINEERING MATHEMATICS

Duration: 1: 00 Hour **Max. Marks: 20**

PART-A 04 × 01 = 04

Instructions: 1. Answer **ALL** questions.
2 Each question carries **ONE** mark.

1. Find the value of $\sin\left(\frac{3\pi}{2}\right)$.
2. If $tan\,\theta = \frac{-3}{4}$, θ lies in the second quadrant then find the value of $\cos 2\,\theta$.
3. Write the formula for $\sin 3A$.
4. Express $2\sin 7\,\theta \sin 3\,\theta$ as a sum/difference.

PART-B 02 × 03 = 06

Instructions: 1. Answer All questions.
2. Each question carries **THREE** marks.

5(a) If $\tan A = \frac{1}{2}$ and $\tan B = \frac{1}{3}$, then find $\tan(A - B)$.

OR

5(b) Show that $\frac{\cos 19° - \sin 19°}{\cos 19° + \sin 19°} = \tan 26^0$.

6(a) Prove that $\frac{\sin 5x + \sin 3x}{\cos 5x + \cos 3x} = \tan 4x$.

OR

6(b) Prove that $\frac{1+\cos 2\theta}{\sin 2\theta} = \cot\theta$.

PART C 02 × 05 = 10

Instructions: 1. Answer All questions.
2. Each question carries **FIVE** marks.

7(a) Prove that $\cos A + \cos(120° + A) + \cos(120° - A) = 0$.

OR

7(b) Evaluate $\sum \frac{\sin(A+B)\sin(A-B)}{\cos^2 A \cos^2 B}$.

8(a) If $A + B + C = \frac{\pi}{2}$, then prove that $\cot A + \cot B + \cot C = \cot A \cot B \cot C$.

OR

8(b) Prove that $\cos 10° \cos 30° \cos 50° \cos 70° = \frac{3}{16}$.

STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TELANGANA
DIPLOMA EXAMINATIONS (C - 24)
SC-102
SEMESTER I, END SEMESTER EXAM, MODEL PAPER
BASIC ENGINEERING MATHEMATICS

Duration: 2:00 Hours **Max. Marks: 40**

PART-A

Instructions: 1. Answer **ALL** questions. 08 × 01 = 08
2. Each question carries **ONE** mark.

1. Define Natural Logarithm.
2. Find the value of $\cos(-510°)$.
3. Write the value of $\sin^{-1}(\theta) + \cos^{-1}(\theta)$.
4. List the elements of a triangle.
5. State the law of tangents.
6. Find the value of $\cos(\cos^{-1}(30°))$.
7. Write the augmented matrix of the system of equations $3x + 2y - z = 4, 2x - 3y + 5z = 7$ and $x - y + z = 3$.
7. What is the formula for the solution of triangle ABC when two sides and an included angle are given?

PART-B

Instructions: 1. Answer All question. 04 × 03 = 12
2. Each question carries **THREE** marks.

9(a) Resolve $\frac{1}{(x+9)(x+7)}$ into partial fractions.

OR

9(b) Prove that $\tan^{-1}\left(\frac{1}{3}\right) + \tan^{-1}\left(\frac{1}{7}\right) = \tan^{-1}\left(\frac{1}{2}\right)$.

10 (a) Prove that $\frac{\cos(A-B)}{\cos A \sin B} = \tan A + \cot B$.

OR

10(b) Find the angle C in any triangle ABC if $b = \sqrt{2}, c = \sqrt{3}, B = 45°$.

11(a) In any triangle ABC, show that $\sin A + \sin B + \sin C = \frac{S}{R}$.

OR

11(b) Prove that $\sin^{-1}\left(\frac{1}{\sqrt{5}}\right) + \tan^{-1}\left(\frac{1}{3}\right) = \frac{\pi}{4}$.

12(a) Using the method of determinants find the value of x from $x + y + z = 2, x + 2y + 3z = 1$ and $3x + y - 5z = 4$.

OR

12(b) In any triangle ABC find the side c, if $a = 2, A = 30°$ and $C = 60°$.

PART C

Instructions: 1. Answer All questions $04 \times 05 = 20$

2. Each question carries **FIVE** marks

13(a) Resolve $\frac{2x}{x^2+2x+1}$ into partial fractions.

OR

13(b) If $tan^{-1}x + tan^{-1}y + tan^{-1}z = \pi$, then prove that $x + y + z = xyz$.

14(a)If $cos\ x + cos\ y = \frac{1}{3}$ and $sin\ x + sin\ y = \frac{1}{4}$, then find $tan\left(\frac{x+y}{2}\right)$.

OR

14(b) Solve the triangle ABC, with $a = 2, b = \sqrt{2}, c = \sqrt{3} + 1$.

15(a)If $cos^{-1}\frac{x}{a} + cos^{-1}\frac{y}{b} = \theta$, t hen show that $\frac{x^2}{a^2} - \frac{2xy}{ab}cos\ \theta + \frac{y^2}{b^2} = sin^2\theta$.

OR

15(b) Show that $\sum a \sin(B - C) = 0$.

16(a) Solve the system of simultaneous equations $x + 2y - z = -3,\ 3x + y + z = 4$ and $x - y + 2z = 6$ by using Gauss-Jordan method.

OR

16(b) Using Matrix inversion method, solve the system of simultaneous equations $x + y + z = 6, x - y + z = 2$ and $2x + y - z = 1$.

SC-103-BASIC PHYSICS

Course Title:	Basic Physics	Course Code :	SC-103
Semester:	I Semester	Course Group :	Foundation
Teaching Scheme in Periods(L:T:P):	4:1:0	Credits :	2.5
Type of Course :	Lecture+ Tutorials	Total Contact Periods:	75 Periods
CIE :	60 Marks	SEE :	40 Marks

Pre requisites

This course requires the basic knowledge of Science and Mathematics

Course Outcomes

Upon completion of the course, the student shall be able to

CO1	Identify the need of dimensional analysis and error measurements of physical quantities.
CO2	Apply vector concepts viz addition, multiplication to explain resultant of vectors, work done by force, power, torque and areas of triangle and parallelogram.
CO3	Analyze the kinematic equations for projectiles and objects moving on horizontal and inclined frictional surfaces.
CO4	Make use of the fundamental properties elasticity, surface tension and viscosity of solids and fluids to solve problems in mechanics.
CO5	Develop the knowledge associated with laws of conservation of energy and Renewable Energy sources such as Solar energy and Wind energy for sustainable environment.
CO6	Utilize the principles of thermal expansion to explain thermostat and identify the significance of laws of thermodynamics.

	Basic and Discipline Specific Knowledge	Problem Analysis	Design/Development of Solutions	Engineering Tools, Experimentation and Testing	Engineering Practices for Society, Sustainability and Environment	Project Management	Lifelong Learning	Linked PO
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO 7	
CO1	3	1	-	-	-	-	2	1,2,7
CO2	3	1	-	-	-	-	2	1,2,7
CO3	3	-	-	-	1	-	2	1,5,7
CO4	3	1	-	-	1	-	2	1,2,5,7
CO5	3	-	-	-	1	-	2	1,5,7
CO6	3	-	-	1	-	-	2	1,4,7

Course contents:

Unit 1 Units, Dimensions and Measurements

Duration: 12 periods (L:10 – T:2)

Physical quantity, Fundamental and derived quantities, unit-definitions- SI units -Advantages of S.I. units, Dimensions and dimensional formula - units and dimensional formulae for physical quantities - Dimensionless quantities - Principle of homogeneity –numerical problems, Applications of dimensional analysis -problems- Limitations of dimensional analysis –accuracy, precision of instruments, Errors in measurement.

Unit 2 Vectors **Duration: 13 periods (L:10 – T:3)**

Scalar and Vector quantities – definition and examples, Graphical representation of a vector, Classification of vectors - numerical problems. Triangle law of vectors, Parallelogram law of vectors – statement- expression for magnitude and direction of resultant vector –derivation- illustrations (working of sling and flying bird), Representation of a vector in terms of unit vectors $\hat{i}, \hat{j}$ *and* $\hat{k}$ – numerical problems.Scalar product of vectors- application to work done by a force and power – properties of scalar product – Numerical problems. Vector product of vectors– application to torque –areas of triangle and parallelogram -properties of vector product - numerical problems.

Unit 3 Mechanics **Duration: 13 periods (L:10 – T:3)**

Equations of motion in a straight line, acceleration due to gravity, equations of motion in vertical motion, Projectile motion of a body- examples, Oblique projection-expression for path of a projectile-derivation-Maximum height, Time of ascent, Time of descent, Time of flight, Horizontal range and maximum horizontal range of a projectile in oblique projection - related numerical problems

Friction – causes-types- Normal reaction, angle of repose and coefficient of friction-laws of static friction, expression for acceleration, displacement and time taken to come to rest by a body on a rough horizontal surface –derivation-numerical problems, expressions for acceleration of a body on a rough inclined surface - advantages and disadvantages of friction, methods of minimizing friction.

Unit 4 Properties of Matter **Duration: 12 periods ((L:10 – T:2)**

Elasticity and elastic bodies-definition- examples, Stress and Strain-expressions-numerical problems, types of stress and strain, Elastic limit-definition, Hooke's law, stress and strain curve, Young's modulus of a wire – derivation-numerical problems, Cohesive and Adhesive forces, Surface tension- explanation and illustrations, capillarity and angle of contact-definitions, formula for determination of surface tension of a liquid based on capillary rise method – outline and related numerical problems, effect of temperature and impurity on surface tension of a liquid, Viscosity-explanation- Newton's formula for viscous force-derivation- coefficient of viscosity-numerical problems- Poiseuille's equation for coefficient of viscosity- related numerical problems, effect of temperature on viscosity of liquids and gases, importance of viscosity in lubricants.

Unit 5 Work and Energy **Duration: 12 periods (L:10 – T:2)**

Work, Power and Energy-explanation-numerical problems, Potential energy and Kinetic energy-explanation- examples, expressions for Potential energy and Kinetic energy and related numerical problems, Work-Energy theorem – statement-proof-related numerical problems, law of conservation of energy-statement-examples-proof in case of a freely falling body - solve related numerical problems, law of conservation of energy in the case of simple pendulum, Non-renewable and Renewable energy sources-explanation- sources, Solar water heater and Wind mill.

Unit 6 Thermal Physics **Duration: 13 periods (L:10 – T:3)**

Transmission of heat -Thermal expansion of solids and three coefficients of expansion of solids – applications, thermal conductivity of a solid – expression, principle of bimetallic strip, bimetallic thermostat, Boyle's law in gases –explanation- its limitations-related numerical problems, concept of Absolute Zero, Absolute scale of temperature, Charles' laws in gases in terms of absolute temperature – related numerical problems, Ideal gas equation-derivation- related numerical problems, gas equation in terms of density- solve related numerical problems, Isothermal and Adiabatic processes, internal energy and external work done – explanation, expression for work done by the gas –derivation- related numerical problems, 1^{st} law of thermodynamics-explanation-list of applications, first law of thermodynamics to isothermal and adiabatic processes, 2^{nd} law of thermodynamics –explanation- list of applications

Reference Books

1. Principles of Physics by N. Subrahmanyam and Brijlal, S. Chand & Co, New Delhi, edition, 1982
2. Engineering Physics by R.K. Gaur, S.L. Gupta, Dhanpatrai Publications, New Delhi.
3. Intermediate Physics, Telugu Academy, TS, Hyderabad.
4. Fundamentals of Physics by Halliday and Resnick.
5. Physics Part-I & II, NCERT

E-learning resources:

Hyper Physics website: http://hyperphysics.phy-astr.gsu.edu/

Learning Outcome:

Upon completion of this course the student will be able to

CO1: Identify the need of dimensional analysis and error measurements of physical quantities.

1.1 Define Physical quantity, Fundamental quantity, derived physical quantity and Unit.

1.2 List SI units of fundamental physical quantities with their symbols (Base and Supplementary quantities).

1.3 Outline advantages of S.I. units.

1.4 Define Dimensions and Dimensional formula of a physical quantity.

1.5 List SI units and dimensional formulae of physical quantities (Area, Volume, Density, Velocity, Acceleration, Momentum, Impulse, Force, Work, Energy, Power, Pressure, Stress, Modulus of Elasticity, Angular velocity, Torque, Frequency, Surface Tension, Coefficient of viscosity, Universal Gravitational constant, Wavelength, Planck's constant)

1.6 List dimensionless quantities.

1.7 Explain principle of homogeneity of dimensions and solve related numerical problems (finding dimensions of terms in an equation).

1.8 List applications of dimensional analysis and solve problems

(1) Correctness of physical equations

(i) Displacement $S = ut + \frac{1}{2}at^2$

(ii) Velocity of sound in elastic medium v = $\sqrt{\frac{E}{d}}$and

(iii) Work done by a gas$W = P(V_2 - V_1)$

(2) Conversion of a unit from SI to CGS (density, force and energy).

(3) Construct a relation between physical quantities. (Time period of simple pendulum$T = 2\pi\sqrt{\frac{l}{g}}$)

1.9 List the limitations of dimensional analysis.

1.10 Explain error, absolute error and percentage error of a physical quantity. Solve numerical problems on percentage error.

CO2: Apply vector concepts viz addition, multiplication to explain resultant of vectors, work done by force, power, torque and areas of triangle and parallelogram.

2.1 Define Scalar and Vector quantities with examples.
2.2 Represent a vector graphically and label vector characteristics.
2.3 Classify Vectors (Proper vector, Equal vectors, Parallel vectors, Negative vector, Unit vector, Null vector, Collinear vectors, Coplanar vectors and Position vector).
2.4 Explain resolution of a Vector into two orthogonal components and solve related numerical problems.
2.5 Explain Triangle law of vectors.
2.6 Explain Parallelogram law of vectors and develop expressions for magnitude and direction of resultant of two vectors and solve related numerical problems.
2.7 Illustrate parallelogram law of vectors (working of sling and flying bird).
2.8 Explain a vector in terms of unit vectors ($\hat{\imath}, \hat{\jmath}, \hat{k}$) and solve related numerical problems on finding magnitude and unit vector.
2.9 Explain Scalar product of two vectors and solve numerical problems.
2.10 Construct expressions for work done ($W = \vec{F}.\vec{S}$) and power ($P = \vec{F}.\vec{v}$) in vector notation starting from force and solve related numerical problems.
2.11 Identify the properties of scalar product.
2.12 Explain vector product of two vectors and solve related numerical problems.
2.13 Construct an expression for torque in vector notation ($\vec{\tau} = \vec{r} X \vec{F}$) starting from force and position vector and solve numerical problems.
2.14 Outline the expressions for areas of triangle and parallelogram in vector notation and solve numerical problems.
2.15 Identify the properties of vector product.

CO3: Analyze the kinematic equations for projectiles and objects moving on horizontal and inclined frictional surfaces.

3.1 Outline the equations of motion in a straight line.
3.2 Explain acceleration due to gravity and extend the equations of motion to freely falling body and body projected vertically upward.
3.3 Explain projectile motion of a body with examples.
3.4 Develop the expression for path of a projectile in oblique projection.
3.5 Develop formulae for Maximum height, Time of ascent, Time of descent, Time of flight, Horizontal range and maximum horizontal range of a projectile in oblique projection and solve related numerical problems.
3.6 Explain friction and causes of friction.
3.7 Classify types of friction.

3.8 Explain the concept of Normal reaction, Angle of repose and Coefficient of friction.

3.9 Outline the laws of Static friction.

3.10 Develop the expression for acceleration of a body on a rough horizontal surface and solve simple numerical problems on a =- μg and F = μR

3.11 Develop the expressions for displacement and time taken to come to rest by a body over a rough horizontal surface and solve simple numerical problems on $s = \frac{u^2}{2\mu g}$ and $t = \frac{u}{\mu g}$

3.12 Develop the expressions for acceleration of a body on a rough inclined surface (moving upward and sliding downward)

3.13 Outline the advantages and disadvantages of friction.

3.14 Identify the methods of minimizing friction.

CO4: Make use of the fundamental properties elasticity, surface tension and viscosity of solids and fluids to solve problems in mechanics.

4.1 Define Elasticity and elastic bodies with examples.

4.2 Explain Stress and Strain with their expressions and solve related numerical problems.

4.3 Explain types of stress and strain (longitudinal, shear and bulk).

4.4 Define Elastic limit and explain Hooke's law.

4.5 Explain stress and strain curve of a metallic wire.

4.6 Develop a formula for Young's modulus of a wire having circular cross-sectional area and solve related numerical problems.

4.7 Compare Cohesive and Adhesive forces.

4.8 Explain Surface tension and illustrate Surface tension with examples.

4.9 Explain capillarity and angle of contact.

4.10 Outline the formula for determination of surface tension of a liquid based on capillary rise method with legible diagram (no derivation $T = \frac{hrdg}{2\,Cos\theta}$)and solve related numerical problems.

4.11 Explain the effect of temperature and impurity on surface tension of a liquid.

4.12 Explain Viscosity.

4.13 Develop Newton's formula for viscous force and explain coefficient of viscosity and solve related numerical problems.

4.14 Outline Poiseuille's equation for coefficient of viscosity and solve related numerical problems.

4.15 Explain the effect of temperature on viscosity of liquids and gases.

4.16 Identify the importance of viscosity in lubricants.

CO5: Develop the knowledge associated with laws of conservation of energy and Renewable Energy sources such as Solar energy and Wind energy for sustainable environment.

5.1 Explain the concept of Work, Power and Energy and solve related numerical problems.
5.2 Explain Potential energy and Kinetic energy with examples.
5.3 Develop expressions for Potential energy and Kinetic energy and solve related numerical problems.
5.4 Develop Work-Energy theorem and solve related numerical problems.
5.5 Explain law of conservation of energy with examples.
5.6 Prove law of conservation of energy in the case of a freely falling body and solve related numerical problems.
5.7 Illustrate law of conservation of energy in the case of simple pendulum.
5.8 Explain Non-renewable and Renewable energy sources and list the sources.
5.9 Explain construction and working of Solar water heater and Wind mill with legible diagrams.

CO6: Utilize the principles of thermal expansion to explain thermostat and identify the significance of laws of thermodynamics.

6.1 Explain modes of transmission of heat.
6.2 Explain thermal expansion of solids and develop three coefficients of expansion of solids and identify the applications.
6.3 Explain thermal conductivity of a solid and develop the expression for it[Q= KA $(\theta_1 - \theta_2)t$].
6.4 Explain principle of bimetallic strip.
6.5 Explain construction and working of bimetallic thermostat as an automatic temperature control device in electrical gadgets.
6.6 Explain Boyle's law in gases and its limitations and solve related numerical problems.
6.7 Explain concept of Absolute Zero using volume and pressure coefficients of a gas [$V_t = V_0(1 + \frac{t}{273})$ and $P_t = P_0(1 + \frac{t}{273})$]and develop Absolute temperature scale.
6.8 Explain Charles' laws in gases in terms of absolute temperature and solve related numerical problems.
6.9 Develop Ideal gas equation and calculate universal gas constant and solve related numerical problems.
6.10 Translate gas equation in terms of density and solve related numerical problems.
6.11 Explain Isothermal and Adiabatic processes and identify differences between them.
6.12 Explain the terms internal energy and external work done by a gas.
6.13 Develop the expression for work done by the gas [$W=P(V_2-V_1)$] and solve related numerical problems.
6.14 Explain first law of thermodynamics and list applications of it and solve related numerical problems.
6.15 Solve first law of thermodynamics to isothermal and adiabatic processes.
6.16 Explain second law of thermodynamics and list applications of it.

Course Content and Blue Print of Marks for SEE

Semester End Examination

Sl No	Unit No.	Questions to be set for SEE					Remarks
		R			U	A	
1	I	4	1		9(a)	13(a)	
2	II						
3	III		2		10(a)	14(a)	
4	IV						
5	V		3	5, 6	9(b) 11(a) 11(b)	13(b) 15(a) 15(b)	
6	VI			7,8	10(b) 12(a) 12(b)	14(b) 16(a) 16(b)	
Total Questions		8			8	8	

Legend:	Remembering (R)	1 Mark
	Understanding (U)	3 Marks
	Application (A)	5 Marks

STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TELANGANA
DIPLOMA EXAMINATION (C 24)
SEMESTER I
MID-I EXAM
SC 103 Basic Physics
Model Question paper

Duration: 1hour **Max. Marks: 20**

PART-A

Instructions: 1. Answer **ALL** questions.
2. Each question carries **ONE** mark. 4X1 =4

1. Define fundamental physical quantity.
2. Name the dimensional formula of Power.
3. How does vector is different from scalar?
4. Define unit vector.

PART-B

Instructions: 1. Answer **ALL** questions.
2. Each question carries **THREE** marks. 2X3 =6

5(a) Outline advantages of S.I. units.

(OR)

(b) The displacement of a particle moving along x-axis with respect to time is $x=at+bt^2-ct^3$. Find the dimensional formulae of a, b and c.

6(a) Explain triangle law of vectors.

(OR)

(b) At an airport, a horizontal wind is blowing at 15 ms^{-1} at an angle of 60^0 north of east. Calculate the components of the wind velocity in the north and east directions.

PART-C

Instructions: 1. Answer **ALL** questions.
2. Each question carries **FIVE** marks. 2X5 =10

7(a) Apply dimensional analysis to convert unit of energy from SI to CGS.

(OR)

(b)Construct an expression for time period of simple pendulum using dimensional analysis starting from length of pendulum (l) , mass of the bob (m) and acceleration due to gravity (g). Take proportionality constant as 2π.

8(a) Develop expressions for magnitude and direction of resultant of two vectors using parallelogram law of vectors.

(OR)

(b)Apply vector properties to find the angle between $\vec{P} = 2\hat{i} - 2\hat{j} + \hat{k}$ and $\vec{Q} = \hat{i} - 2\hat{j} + \hat{k}$

STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TELANGANA

DIPLOMA EXAMINATION (C 24)
SEMESTER I
MID-II EXAM
SC 103Basic Physics
Model Question paper

Duration: 1hour **Max. Marks: 20**

PART-A

Instructions: 1. Answer **ALL** questions.
2. Each question carries **ONE** mark.

4X1 =4

1. What is a projectile?
2. Define Normal reaction
3. Define Elastic limit.
4. Define angle of contact.

PART-B

Instructions: 1. Answer **ALL** questions.
2. Each question carries **THREE** marks. 2X3 =6

5(a)A ball is kicked into air with a velocity of 20 ms^{-1} at an angle 30^0 to the Earth's surface. Find maximum height reached by the ball. (Take g = 10 ms^{-2})

(OR)

(b)Outline the laws of Static friction.

6(a)An object of weight 20 N suspended vertically from a crane on a steel cable 4 m long and 2 mm in diameter produces an elongation of 0.24 mm. Calculate the stress and strain in the cable.

(OR)

(b)Draw a neat diagram for the rise and fall of a liquid in a capillary tube showing meniscus and angle of contact.

PART-C

Instructions: 1. Answer **ALL** questions.
2. Each question carries **FIVE** marks. 2X5 =10

7(a) Develop the expression for path of a projectile in oblique projection.

(OR)

(b)Develop the expression for acceleration of a body moving up on a rough inclined surface

8(a) Develop a formula for Young's modulus of a wire having circular cross-sectional area.

(OR)

(b) Develop Newton's formula for viscous force and explain coefficient of viscosity.

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STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TELANGANA

DIPLOMA EXAMINATION (C 24)
SEMESTER I
SEMESTER END EXAM
SC 103 Basic Physics
Model Question paper

Duration: 2 hours **Max. Marks: 40**

PART – A

Instructions: 1. Answer **ALL** questions.
2. Each question carries **ONE** mark.

8X1=8

1. Name the dimensional formula of universal gravitational constant.
2. Define angle of repose.
3. What is kinetic energy?
4. Name one example of surface tension.
5. Define renewable energy source.
6. What is the principle of working of wind mill?
7. Define convection..
8. Define internal energy.

PART – B

Instructions: 1. Answer **ALL** questions.
2. Each question carries **THREE** marks.

4X3=12

9(a). Explain vector product of two vectors.

(OR)

(b). A gun fires 120 bullets per minute. Find the power of the gun if the mass of each bullet is 3 g and velocity is 500 ms^{-1}.

10(a). Draw a neat diagram to show various forces acting on a body which is (a) sliding downward and (b) moving upward on a rough inclined surface.

(OR)

(b).Explain principle of bimetallic strip.

11(a). Calculate the work done by a ball of mass 2 kg when its velocity increases from 5 m/s to 10 ms^{-1} due to applied force.

(OR)

(b). The work done by a person in carrying a box of mass 20 kg through a vertical height of 5 m is 4900 J. Find the mass of the person.

12(a). The volume of a gas at 30^0C is 200 cc. What is the volume of the gas if temperature of the gas is raised to 100^0C at constant pressure?

(OR)

(b). Explain Boyle's law and its limitations.

PART – C

Instructions: 1. Answer **ALL** questions.
2. Each question carries **FIVE** marks.

4X5 = 20

13(a). Develop expressions for magnitude and direction of resultant of two vectors using parallelogram law of vectors.

(OR)

(b). Develop Work-Energy theorem.

14(a). Draw a schematic graph of the applied force versus resulting elongation of a metallic wire. Identify the important features in it.

(OR)

(b). Develop the relation between Pressure, Volume and Temperature of an ideal gas.

15(a). Prove law of conservation of energy in the case of a freely falling body.

(OR)

(b). Explain working of wind mill with legible diagram.

16(a). Develop the relation between Pressure, Volume and Temperature of an ideal gas.

(OR)

(b). Explain thermal conductivity of a solid and develop the expression for it.

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SC-104-GENERAL ENGINEERING CHEMISTRY

Course Title	General Engineering Chemistry	Course Code	SC-104
Semester	I	Course Group	Foundation
Teaching Scheme in Periods(L:T:P)	4:1:0	Credits	2.5
Methodology	Lecture + Tutorial	Total Contact Periods	75
CIE	60 Marks	SEE	40 Marks

Prerequisite: Basic knowledge of chemistry in secondary education and appreciate the role of Chemistry and environmental science in different spheres of industries.

Course Outcome: On successful completion of the course, the students will have ability to attain below

Course Outcomes (CO):

CO1	Explain the concept of atomic structure, chemical bonding, oxidation, reduction and oxidation number and apply the knowledge in the selection of engineering materials.
CO2	Explain concept of mole, molarity, normality and colloids and utilize the knowledge in various industrial processes.
CO3	Make use of the different theories of acids and bases, concept of pH, buffer action and apply the knowledge in selection of solutions in industrial areas.
CO4	Extend the knowledge of Ecosystem, Biodiversity, Green Chemistry and Management of e-waste in maintaining the sustainable development of society.
CO5	Identify the hardness and degree of hardness of water and apply there Levant water treatment methods to solve domestic and industrial problems.
CO6	Explain the concept of electrolysis, applications of electrolysis, Faraday's Laws of Electrolysis and apply the knowledge in extraction and purification of metals used for domestic and industrial purposes.

CO-PO-Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	3	-	-	-	-	-	1
CO2	3	1	-	-	1	-	2
CO3	3	1	-	-	-	-	2
CO4	3	-	-	-	3	-	3
CO5	3	1	-	-	3	-	-
CO6	3	1	-	-	-	-	-

COURSE CONTENTS:

UNIT-I: Fundamentals of Chemistry **L10 + T3 Periods**

Atomic Structure: Introduction – Atomic number – Mass number - Isotopes and Isobars -Bohr's Atomic Theory- Quantum numbers - Orbitals - Shapes of s, p and d orbitals – Aufbau principle - Hund's rule -Pauli's exclusion principle-Electronic configuration of elements

Chemical Bonding: Introduction – Electronic theory of valency - Types of chemical bonds Ionic, Covalent, Co-ordinate covalent and Metallic bond- properties of Ionic and Covalent compounds.

Oxidation - Reduction: Electronic concept of Oxidation, Reduction and Redox reaction.

Oxidation number - Calculations.

UNIT-II: Solutions and Colloids **L10+ T2Periods**

Introduction - Solution – Solubility - Classification of solutions based on solubility and physical state-Atomic weight-Molecular weight, Equivalent weight-Mole concept –Molarity–Normality

Numerical problems on mole, molarity and normality –Colloids- Types of colloids-Lyophilic and Lyophobic colloids -Properties of Colloids -Industrial applications of colloids

UNIT-III: Acids and Bases **L10+ T2 Periods**

Introduction - Theories of acids and bases and limitations - Arrhenius theory - Brownsted Lowry theory - Lewis acid base theory - Ionic product of water - pH and related numerical problems-Buffer solutions-buffer action-Applications of buffer solution-Ostwald’s theory of indicators.

UNIT-IV: Environmental Science **L10+ T3 periods**

Introduction-Environment –Scope and importance of environmental studies- Important terms-Concept of ecosystem - Producers, consumers and decomposers - Biodiversity, definition an threats to Biodiversity- Green Chemistry– e-waste –Management of e-waste.

UNIT-V: Water Technology **L10+ T3 periods**

Introduction-Soft and hard water-Causes of hardness–Types of hardness-Disadvantages of hard water using in industries-Degree of hardness-Softening methods-Permutit process, Ion exchange process-Drinking water-Municipal treatment of water for drinking purpose–Osmosis-Reverse Osmosis-Advantages of Reverse osmosis–Desalination by Electro dialysis.

UNIT-VI: Electrochemistry **L10+ T2Periods**

Conductors, insulators, electrolytes–Types of electrolytes-Arrhenius theory of electrolytic dissociation- Electrolysis– Electrolysis of fused NaCl and aqueous NaCl-Applications of electrolysis-Faraday's laws of electrolysis-Numerical problems.

COURSE OBJECTIVES

CO1: Explain the concept of atomic structure, chemical bonding, oxidation, reduction and oxidation number and apply the knowledge in the selection of engineering materials.

1.1 Compare the mass and charge of proton, electron and neutron
1.2 Define and explain atomic number, mass number, isotopes and isobars
1.3 State the postulates of Bohr's atomic theory and its limitations
1.4 Explain Quantum numbers and their Significances
1.5 Define an Orbital explain the shapes of s, p and d orbitals.
1.6 Outline the differences between Orbit and Orbital
1.7 Define electronic configuration and apply Aufbau principle, Hund's rule, and Pauli’s exclusion principle in writing electronic configuration of elements up to atomic number 30
1.8 Explain the postulates of Electronic theory of valency
1.9 Define chemical bond and list the types of chemical bond
1.10 Define ionic bond and explain the Ionic bond formation in NaCl and MgO molecules
1.11 Define and explain the types of covalent bonds
1.12 Explain the covalent bond formation in homo atomic molecules (non-polar molecules): H_2, O_2, N_2
1.13 Explain the covalent bond formation in hetero atomic molecules (polar molecules): HF and H_2O
1.14 Explain the properties of ionic compounds and covalent compounds
1.15 Compare the properties of ionic compounds and covalent compounds
1.16 Define Co-ordinate covalent bond and explain the bond formation in ammonia borontrifluoride and Hydronium ion
1.17 Define metallic bond and explain with free electron theory/ electron sea model
1.18Define and explain the electronic concept of oxidation, reduction and redox reaction
1.19 Define oxidation number and list the rules for calculation of oxidation number
1.20Find the oxidation number of C, N, S, P, Cr and Mn in their compounds

CO2: Explain concept of mole, molarity, normality and colloids and utilize the knowledge in various industrial processes.

2.1 Define the terms: solution, solute, solvent, aqueous solution and alcoholic solution with examples

2.2 Define solubility and classify the solutions based on solubility

2.3 Classify the solutions based on the physical state of solution, solute and solvent

2.4 Define atomic weight, molecular weight and equivalent weight

2.5 Find the molecular weight and the equivalent weights of acids, bases and salts

2.6 Explain mole concept and solve the numerical problems on mole

2.7 Define and explain molarity and normality

2.8 Find the relationship between molarity and normality

2.9 Solve numerical problems on molarity and normality of solutions

2.10 Define the terms: true solution, colloids and suspensions with examples

2.11 Classify the colloids and explain their properties

2.12 Compare the properties of Lyophilic Colloid and Lyophobic Colloid

2.13 Explain the general properties of colloids such as a) Tyndall effect b) Brownian movement and c) Coagulation

2.14 Explain in brief any five industrial applications of colloids

CO3: Make use of the different theories of acids and bases, concept of pH, buffer action and apply the knowledge in selection of solutions in industrial areas.

3.1 Explain the postulates and limitations of Arrhenius theory of acids and bases

3.2 Explain the postulates and limitations of Brownsted - Lowry theory of acids and bases

3.3 Explain the postulates and limitations of Lewis theory of acids and bases

3.4 Define and explain the ionic product of water and solve numerical problems

3.5 Define pH and solve numerical problems on pH

3.6.Explain Ostwald's theory of indicators with phenolphthalein and methyl orange indicators as examples

3.7 Define buffer solution and explain the acidic and basic buffers with examples

3.8 Explain buffer action of Acetate buffer and Ammonium buffer

3.9 Explain general applications of buffer solutions

CO4: Extend the knowledge of Ecosystem, Biodiversity, Green Chemistry and Management of e-waste in maintaining the sustainable development of society.

4.1 Define and explain different segments of environment: i) Atmosphere, ii) Hydrosphere, iii) Lithosphere and iv) Biosphere

4.2 Define the terms: i) Pollutant, ii) Contaminant iii) Pollution, iv) Receptor, v) Sink, vi) Particulates, vii) Threshold limit value (TLV), viii) Dissolved oxygen (DO), ix) BOD and x) COD

4.3 Define Ecosystem. Explain the biotic and abiotic components of ecosystem.

4.4 Define and explain the following biotic components with examples:
1) Producers, 2) Consumers and 3) Decomposers

4.5 Define biodiversity and explain the threats to biodiversity

4.6 Explain the methods of conservation of biodiversity

4.7Define and explain the principles of Green chemistry

4.8 Define e-waste and explain the sources of e-Waste

4.9 Explain the effect of e-waste on environment and human beings

4.10 Explain the management of e-waste-Land filling, incineration and recycling.

CO5: Identify the hardness and degree of hardness of water and apply there Levant water treatment methods to solve domestic and industrial problems.

5.1 List the various sources of water.

5.2 Define the terms soft water and hard water

5.3 Define hardness of water and name the compounds responsible for hardness

5.4 Define and explain the types of hardness

5.5Identify the disadvantages of using hard water in industries: i) Boilers ii) Laundry, iii) Textile industry, iv) Paper industry, v) Sugar Industry and vi) Pharmaceutical industry

5.6 Define degree of hardness and explain different units of hardness - ppm and mg/L solve numerical problems on degree of hardness

5.7 Utilize and explain a) Permutit process and b) Ion-Exchange process in softening of hard water:

5.8 Define desalination of water

5.9 Define Osmosis and Reverse Osmosis (RO)

5.10 Explain the process of conversion of sea water into drinking water by reverse osmosis

5.11 List the applications and advantages of RO.

5.12 Explain the desalination of sea water by Electro dialysis.

5.13 List the essential qualities of drinking water.

5.14 Explain the Municipal treatment of water for drinking purpose with flow chart-
a) Sedimentation b) Coagulation c) Filtration, d) Sterilization by Aeration and Chlorination

CO6: Explain the concept of electrolysis, applications of electrolysis, Faraday's Laws of Electrolysis and apply the knowledge in extraction and purification of metals used for domestic and industrial purposes.

6.1 Define the terms, conductor, insulator, electrolyte and non-electrolyte

6.2 Classify the electrolytes - strong and weak electrolytes with examples.

6.3 Compare and contrast the metallic conductors and electrolytic conductors.

6.4 Explain the Arrhenius theory of electrolytic dissociation.

6.5 Define electrolysis.

6.6 State and explain Faraday's laws of electrolysis

6.7 Define chemical equivalent and electrochemical equivalent and their relation

6.8 Numerical problems based on Faraday's I-law and II- law

6.9 Construct the suitable electrolytic cell to explain the electrolysis of fused NaCl and aqueous NaCl (Nelson Cell).

6.10 Apply the principle of electrolysis in Electrolytic refining of copper metal and Electroplating.

BOARD DIPLOMA EXAMINATIONS (C24)
FIRST SEMESTER EXAMINATION
MIDSEM -I
SC-104-GENERALENGINEERINGCHEMISTRY

Time:1Hour

Max.Marks:20

PART–A

Instructions: Answer all questions. Each question carries one mark 4 x 1 = 4 Marks

1. State Hund's rule.
2. What is the electronic configuration of Cr.
3. Define mole.
4. What are colloids?

PART–B 2 x 3 = 6 Marks

Instructions: Answer the following questions.

Each question carries three marks

5. a) Outline the shapes of s and d orbitals.

(OR)

5. b) Explain the covalent bond formation n Nitrogen molecule by Lewis dot method.

6. a) Classify solutions based on their physical state.

(OR)

6. b) Compare any three properties of lyophilic and lyophobic colloids.

PART – C

Instructions: Answer the following questions.
Each question carries five marks 2 x 5 = 10 Marks

7. a) Identify and explain the nature of bonding in the following molecule 1.MgO, 2.HCl

(OR)

b) Find the oxidation number of 'S' in H_2SO_4,'Mn' in$KMnO_4$ and Cr' in $K_2Cr_2O_7$

8. a) Find the weight of H_2SO_4 required to prepare 400 ml of 0.5M solution.

(OR)

b) Find the normality of 500 ml solution containing 0.53grams of Na_2CO_3.

BOARD DIPLOMA EXAMINATIONS (C24)

FIRST SEMESTER EXAMINATION
MIDSEM -II
SC-104-GENERALENGINEERINGCHEMISTRY

Time: 1Hour

Max. Marks: 20

PART–A

Instructions: Answer all questions. Each question carries one mark 4 x 1 = 4 Marks

1. What is conjugate acid base pair?
2. Define ionic product of water.
3. Define an ecosystem.
4. What is threshold limit value?

PART–B

Instructions: Answer the following questions. 2 x 3 = 6 Marks

Each question carries three marks

5. a) .Outline the limitations of Arrhenius theory of acid sand bases?

(OR)

b) Explain neutralization according to Lewis theory of acids and bases with an example.

6. a) Explain the terms producers, consumers and decomposers with example.

(OR)

b) Explain the effect of e-waste on environment.

PART – C

Instructions: Answer the following questions. 2 x 5 = 10 Marks

Each question carries five marks

7. a) Define pH. Find the pH of 0.5M NaOH solution.

(OR)

8. b) What are buffer solutions? Explain any four applications of buffer solutions.

9. a) What is Biodiversity? Explain the methods of Conservation of Biodiversity.

(OR)

b) What is Green chemistry? Explain any four principles of Green Chemistry.

BOARD DIPLOMA EXAMINATIONS (C24)
FIRST SEMESTER EXAMINATION
SEMESTER END EXAMINATION
SC-104-GENERALENGINEERINGCHEMISTRY

Time:2Hours **Max.Marks:40**

PART-A

Instructions: Answer all questions. Each question carries one mark. 8 X 1 = 8 marks

1. Define atomic mass number.
2. What is biodiversity?
3. Define degree of hardness of water.
4. What are buffer solutions?
5. Define soft water and hard water.
6. Name the salts responsible for temporary hardness of water.
7. Define the terms conductor and insulator.
8. What is an electrolyte?

PART– B

Instructions: Answer the following questions. 4x3=12Marks
Each question carries three marks

9. a) State and explain Hund's rule.

(OR)

b) Interpret any six essential qualities of drinking water.

10. a) .Explain the terms producers, consumers and decomposers with examples.

(OR)

b) Explain strong and weak electrolytes? Give examples.

11. a) Define reverse osmosis and predict its advantages.

(OR)

b) Compare temporary and permanent hardness of water.

12. a) Identify the differences between metallic and electrolytic conductors.

(OR)

b) Explain Faraday's Laws of electrolysis.

PART– C

Instructions: Answer the following questions. 4 x5 =20 Marks
Each question carries five marks.

13. a) Find the Molarity and Normality of the two liters of solution containing 10.6 grams of Na_2CO_3.

(OR)

b) Find the temporary and permanent hardness of water containing the following salts per liter
i. $Ca(HCO_3)_2$ =32.4 mg ii. $Mg(HCO_3)_2$=29.2mg iii.$CaSO_4$ =13.6mg iv.$MgCl_2$ =19 mg

14. a) Explain Lewis theory of acids and bases.

(OR)

b) Explain the process of electrolysis of fused NaCl.

15. a) Explain the Permutit process of softening of hard water with a neat labeled diagram.

(OR)

b) Identify and explain the disadvantages of using hard water in the following industries?
i).Boilers ii) Laundry iii) Paper industry iv) Textile industry v) Pharmaceuticals

16. a).Explain the process of electrolytic refining of copper.

(OR)

b) Find the weight of Al deposited on the cathode if 0.5 amperes of electric current is passed through $AlCl_3$ solution for1 hour.

CE-105-BASIC SURVEYING

Course Title:	Basic Surveying	Course Code :	CE-105
Semester:	I Semester	Course Group :	Core
Teaching Scheme in Periods(L:T:P):	60:15:0	Credits :	2.5
Type of Course :	Lecture+ Tutorials	Total Contact Periods :	75 Periods
CIE :	60 Marks	SEE :	40 Marks

Pre requisites

This course requires the basic knowledge of Trigonometry and basics of map study

Course Outcomes

Upon completion of the course, the student shall be able to

CO1 :	Outline the basic principles of Surveying and Chain Surveying
CO2 :	Describe standard methods in linear measurement and ranging of survey lines.
CO3 :	Drawing a chain line and marking various offsets from main line.
CO4 :	Computation of areas and errors in chain Surveying
CO5 :	Explain the principles and procedures of Compass Surveying and compute included angles from given bearings
CO6 :	Plot the closed traverse for the given data and adjust the closing error by using Bowditch rule

Course Content and Blue Print of Marks for SEE

<table>
<tr><th rowspan="2">Unit No</th><th rowspan="2">Unit Name</th><th rowspan="2">Periods</th><th colspan="3">Questions to be set for SEE</th></tr>
<tr><th colspan="2">R</th><th>U</th><th>A</th></tr>
<tr><td>1</td><td>Introduction and Fundamental concepts of surveying</td><td>10</td><td rowspan="6">Q4</td><td colspan="2" rowspan="2">Q1</td><td rowspan="2">Q9(a)</td><td rowspan="2">Q13(a)</td></tr>
<tr><td>2</td><td>Linear Measurements and their Methods-Principles</td><td>15</td></tr>
<tr><td>3</td><td>Chain surveying Instruments and Obstacles</td><td>10</td><td colspan="2" rowspan="2">Q2</td><td rowspan="2">Q10(a)</td><td rowspan="2">Q14(a)</td></tr>
<tr><td>4</td><td>Operations in Chain Surveying and calculation of areas</td><td>15</td></tr>
<tr><td>5</td><td>Principles & instruments in compass surveying</td><td>10</td><td rowspan="2">Q3</td><td>Q5,Q6</td><td>Q9(b), Q11(a), Q11(b)</td><td>Q13(b), Q15(a), Q15(b)</td></tr>
<tr><td>6</td><td>Compass Traversing and errors</td><td>15</td><td>Q7,Q8</td><td>Q10(b), Q12(a), Q12(b)</td><td>Q14(b), Q16(a), Q16(b)</td></tr>
<tr><td colspan="2">Total</td><td>75</td><td colspan="2">8</td><td>8</td><td>8</td></tr>
</table>

Course Contents

UNIT 1: Introduction and fundamental concepts of surveying

Duration: 10 Periods ((L: 8 – T:2)

a) Concept of Surveying - purpose of Surveying - Divisions of surveying- Classification of Surveying based on different criteria- Fundamental principles of Surveying -
b) Measurements-Units and conversions-Instruments used for taking linear and angular measurements-
c) Plans and Maps-Choice of Scales in a map- nature of work of a surveyor

UNIT 2 Linear Measurements and their Methods- Principles

Duration: 15 Periods (L: 12 – T: 3)

a) Different Methods- Direct Measurement-Instruments for Linear Measurements-
b) Types of chains and Tapes- Measurement of line with help of chain and Tape-Ranging survey Lines-Purpose
c) Principle of Chain Surveying -Suitability of Chain Surveying-Survey stations and their selection.

UNIT 3: Chain surveying Instruments and Obstacles

Duration: 10 Periods (L: 8 – T:2)

a) Survey lines and offsets -Purpose-Perpendicular and oblique-
b) Instruments used in Chain survey and their function Ranging a survey line- Direct ranging and Indirect ranging
c) Chaining a line -Duties of leader and follower- Chaining on a sloping ground
d) Obstacles in chaining-methods to overcome obstacles-Problems

UNIT 4: Operations in Chain Surveying and calculation of areas

Duration: 15 Periods (L: 12 – T:3)

a) Errors in ordinary chaining -Correction due to incorrect length of Chain-problems
b) Different operations in Chain Surveying- Setting out right angles with cross staff- Cross staff survey - Recording field notes in Field book.
c) Calculations of area -Average ordinate, Mid-ordinate, Trapezoidal and Simpson's rules.

UNIT 5: Principles & instruments in compass surveying

Duration: 15 Periods (L: 8 – T:2)

a). Introduction, Purpose, principle and uses of compass Survey- - Description working and use of Prismatic compass - Operations in using Compass before taking readings
b). Concept of Meridian-Types of meridians - Bearing and angle-Designation of bearings- Whole Circle Bearing, Quadrantal Bearing – Conversions
c). Local attraction-detection and correction

UNIT 6: Compass Traversing and errors

Duration: 10 Periods (L: 8 – T:2)

a) Field work in Compass Survey -field notes-Traverse-Open and Closed Traverse using Prismatic Compass.
b) Determination of included angles from the given bearings and vice versa in compass traverse
c) Plotting of Compass traverse - closing error and adjustment by Bowditch graphical method.
d) Errors in Compass Surveying

Recommended Books

1. Surveying - N.N.Basak - Tata McGraw Hill
2. Surveying Vol-I - S.K.Duggal -McGraw Hill Edn (India) Pvt Ltd
3. Surveying and Levelling Vol -1 -Kulkarni and Kanetkar
4. Surveying and Levelling Vol. - 1 - B.C. Punmia
5. Surveying and Levelling -Vol -1 -R.Agor- Khanna Publishers

Suggested E-Learning references

1.www.elearning.com/survey
2. http://nptel.ac.in

Suggested Learning Outcomes

Upon completion of the course, the student shall be able to

CO1 - Outline the basic principles of Surveying and Chain Surveying

1.1 State the concept of surveying.
1.2 State the purpose of surveying.
1.3 Distinguish between Plane and Geodetic surveying.
1.4 List the units of linear and angular measurements in Surveying and conversions.
1.5 List the instruments used for taking linear and angular measurements.
1.6 Classify surveys based on different criteria
1.7 State the fundamental principles of surveying.

CO2 - Describe standard methods in linear measurement and ranging of survey lines.

2.1 State and explain the stages of survey operations.
2.2 State the purpose of Chain surveying
2.3 State the principle of Chain surveying.
2.4 Explain the principles used in Chain triangulation.
2.5 List different instruments used in Chain Surveying.

CO3 - Drawing a chain line and marking various offsets from main line.

3.1 Explain the functions of different instruments used in Chain Surveying.
3.2 List the points to be followed while selecting the survey stations
3.3 Define ranging
3.4 Explain the methods of ranging a line.
3.5 List the operations involved in chaining on 1. Flat ground,2. Sloping ground
3.6 Describe the method of setting out right angles with or without Cross staff
3.7 Record field observations. in Field book

CO4 - Computation of areas and errors in chain Surveying

4.1 Know the errors in Chain surveying.
4.2 Determine the corrections for measurement due to incorrect length of chain.
4.3 Calculate the areas of irregular boundaries using
   i) Average Ordinate rule
   ii) Mid -Ordinate rule
   iii) Trapezoidal rule
   iv) Simpson's rule.

CO5 - Explain the principles and procedures of Compass Surveying and compute included angles from given bearings

5.1 State the purpose of Compass surveying.
5.2 State the principles and uses of Compass surveying.
5.3 Identify the parts of Prismatic Compass
5.4 Explain the functions of parts of Prismatic Compass
5.5 Define terms
   i) Whole Circle Bearing
   ii) Quadrantal Bearing
   iii) True meridian
   iv) Magnetic meridian
   v) True bearing
   vi) Magnetic bearing
   vii) Local attraction.
5.6 Convert Whole Circle Bearing into Quadrantal Bearing and vice versa.
5.7 Explain the effect of local attraction
5.8 Compute corrected bearings for local attraction.

CO6 - Plot the closed traverse for the given data and adjust the closing error by using Bowditch rule

6.1 Compute the included angles of lines in a Compass traverse.
6.2 Explain the operations involved in field in compass Surveying
6.3 Explain the method of plotting closed traverse and adjusting closing error by Bowditch rule.
6.4 List the errors in Compass surveying.

Suggested Student Activities

1. Tech fest/Srujana
2. Paper/Poster presentation
3. Quiz
4. Group discussion
5. Surprise test

CO-PO Mapping Matrix

	Basic and Discipline Specific Knowledge	Problem Analysis	Design/Development of Solutions	Engineering Tools, Experimentation and Testing	Engineering Practices for Society, Sustainability and Environment	Project Management	Lifelong Learning	Linked PO
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO 7	
CO1	3	1	-	2	1	-	2	1,2,4,5,7
CO2	3	3	1	2	1	1	2	1,2,3,4,5,6,7
CO3	3	3	1	2	1	1	2	1,2,3,4,5,6,7
CO4	3	2	2	1	1	1	2	1,2,3,4,5,6,7
CO5	3	3	2	2	1	1	2	1,2,3,4,5,6,7
CO6	3	2	3	3	1	1	2	1,2,3,4,5,6,7

QUESTION PAPER PATTERN FOR SEMESTER END EXAM

Sl.No	Description	Level	No of Questions	Marks for each question	Choice	Total Marks
01	Part-A	Remembering(R)	8	1	Nil	8 Marks
02	Part-B	Understanding(U)	8	3	4	12 Marks
03	Part-C	Application(A)	8	5	4	20 Marks
Total Marks						40 Marks

Unit No	Questions to be set for SEE			
	R		U	A
I	Q4	Q1	Q9(a)	Q13(a)
II				
III		Q2	Q10(a)	Q14(a)
IV				
V		Q3 Q5,Q6	Q9(b), Q11(a), Q11(b)	Q13(b), Q15(a), Q15(b)
VI		Q7,Q8	Q10(b), Q12(a), Q12(b)	Q14(b), Q16(a), Q16(b)
Total Questions	8		8	8

State Board of Technical Education and Training, Telangana
Model Question paper
DCE I semester Mid Semester-I Examination

Course Code: CE-105 **Duration: 1hour**
Course Name: Basic Surveying **Max.Marks:20 Marks**

PART-A

Answer **all** questions, Each Question carries **one** mark **4x1 = 04 Marks**

1) List the divisions of survey based on methods employed.
2) What are the units of angular measurements?
3) List the suitable conditions of chain surveying
4) What are the different types of tapes and chains?

PART-B

Answer **two** questions, Each Question carries **Three** marks **2x3 = 06 Marks**

5) (a) Write the classification of surveying on different criteria

(or)

5) (b) State the fundamental principal of chain surveying.

6) (a) Write three precautions to be taken while entering/ measuring in field book.

(or)

6(b) State any five points to be kept in mind while selecting a survey station.

PART-C

Answer **two** questions, Each Question carries **five** marks **2x5 = 10 Marks**

7) (a) Name the stages of surveying operations and explain any two stages

(or)

7) (b) Explain the classification based on object of survey

8) (a) Explain about different methods of linear measurement and list the instruments used.

(or)

8) (b) Write suitability of chain surveying and selection of survey station.

State Board of Technical Education and Training, Telangana
Model Question paper
DCE I semester Mid Semester-II Examination

Course Code:CE-105 **Duration: 1hour**
Course Name: Basic Surveying **Max.Marks:20 Marks**

PART-A

Answer **all** questions, Each Question carries **one** mark **4x1 = 04 Marks**

1) What are different types of offsets in chain surveying
2) Write any two duties of leader in chain surveying
3) List the steps of recording field book
4) What are the errors in ordinary chaining.

PART-B

Answer **two** questions, Each Question carries **Three** marks **2x3 = 06 Marks**

5(a) What are the obstacles in chain surveying

(or)

5(b) Explain the method to overcome the obstacles in chain surveying

6(a) Explain the procedure of setting out right angles using cross staff.

(or)

6(b) Write about mid-ordinate method of calculating area.

PART-C

Answer **two** questions, Each Question carries **five** marks **2x5 = 10 Marks**

7(a) What are the obstacles in chain survey and methods to overcome the obstacles.

(Or)

7(b) Explain the procedure of setting a perpendicular offset in chain surveying

8(a) The area of the field measured with a chain which was 0.5% too short was found to be 32 hectares. What is the true area of the field

(or)

8(b)The following offsets were taken from a chain line to an irregular boundary line at an interval of 10 m:

0, 2.50, 3.50, 5.00, 4.60, 3.20, 0 m

Compute the area between the chain line, the irregular boundary line and the end of offsets by mid ordinate rule

State Board of Technical Education and Training, Telangana
Model Question paper
DCE I semester End Semester Examination

Course Code:CE-105 **Duration:2hours**
Course Name: Basic Surveying **Max.Marks:40 M**

PART-A

Answer **all** questions, Each Question carries **one** mark **8x1 = 08 Marks**

1) Define surveying.
2) List the steps of recording field book
3) What is the use of compass?
4) State the principle of compass surveying
5) Write the types of meridians.
6) Convert 345 degrees to RB.
7) What are the different types of traverse
8) Write different types of errors in compass survey
9)

PART-B

Answer **Four** questions, Each Question carries **three** marks **4x3 = 12 Marks**

9(a) Write the classification of surveying on different criteria

(or)

9(b) Convert the following bearings from one system to another.
a) 169^o 45' b) S 46^o 15' W.

10(a) Explain the procedure of setting out right angles using cross staff

(or)

10(b) Explain the bowditch graphical method to adjust the closing error.

11(a)Convert following WCB to RB i) 235 ii) 145 iii) 90 degrees

(or)

11(b) What are the local attractions and can be detected in compass survey.

12(a) Data from a closed traverse PQRS whose included angles are PQ =88° QR= 92° RS =94° SP = 89°. Calculate the closing error

(or)

12(b) Explain the procedure for adjusting closing error using Bowditch method

PART-C

Answer **four** questions, Each Question carries **five** marks **4x5 = 20 Marks**

13(a) Explain the classification based on object of survey

(or)

13(b) Define meridian and write the types of meridians.

14(a) Explain the indirect method ranging

(or)

14(b) Explain with the help of sketch one method of plotting the compass survey

15(a) Sketch and label the part of Prismatic compass

(or)

15(b)) The following bearings were taken in a traversing with a compass in a place where local attraction was suspected. At what stations do you suspect local attraction. Determine the correct bearings each line.

Line	F.B	B.B
AB	$44^{o}30'$	$226^{o}30'$
BC	$124^{o}30'$	$303^{o}15'$
CD	$181^{o}00'$	$1^{o}00'$
DA	$289^{o}30'$	$108^{o}45'$

16(a)Find the included angles for the given closed traverse ABCDA from the following data.

Line	F.B	B.B
AB	$45^{o}15'$	$225^{o}15'$
BC	$123^{o}15'$	$303^{o}15'$
CD	$181^{o}00'$	$1^{o}00'$
DA	$289^{o}30'$	$109^{o}30'$

16(b) A closed traverse is conducted in anti-clockwise direction with five stations A,B,C,D and E in the form of a regular pentagon. If the fore bearing of AB is 45°00', find the fore bearings of other sides

CE-106 - BUILDING MATERIALS

Course Title	Building Materials	Course Code	CE-106
SEMESTER	I	Course Group	Core
Teaching Scheme in Periods(L:T:P)	60:15	Credits	2.5
Methodology	Lecture +Tutorials	Total Contact Periods	75
CIE	60 Marks	SEE	40 Marks

Pre-requisites

This subject requires the basic knowledge of basic sciences**.**

Course Outcomes

Upon completion of the course, the student shall be able to

CO1	Explain the origin, types and uses of building stones, characteristics of good building stones used in construction, varieties of stones available along with their uses, purpose of dressing of stones. Sand function as a building material.
CO2	Steps involved in manufacture of bricks used for Construction, its characteristics, types of tiles used in construction along with methods of testing building materials .
CO3	State and explain method of using different types of cement, classification of cement based on its use, standard tests procedures done on cement.
CO4	State and explain method of using different types of cement mortar and cement concrete after testing their quality by standard procedures.
CO5	Types and uses of surface protective materials like Paints, Enamels, Varnishes, Distempers, Emulsion, French polish and Wax Polish
CO6	Comprehend timber as construction material, wood products, glass, plastic, asbestos

Course Content and Blue Print of Marks for SEE

<table>
<tr><td rowspan="2">Unit No.</td><td rowspan="2">Unit Name</td><td rowspan="2">Periods</td><td colspan="4">Questions to be set for SEE</td></tr>
<tr><td colspan="2">R</td><td>U</td><td>A</td></tr>
<tr><td>1.</td><td>Stones and Sand</td><td>10</td><td rowspan="6">Q4</td><td>Q1</td><td></td><td>Q9(a)</td><td>Q13(a)</td></tr>
<tr><td>2.</td><td>Bricks, Tiles</td><td>15</td><td colspan="3" rowspan="2"></td><td rowspan="2"></td></tr>
<tr><td>3.</td><td>Cement</td><td>10</td></tr>
<tr><td>4.</td><td>Mortar and Concrete</td><td>15</td><td>Q2</td><td></td><td>Q10(a)</td><td>Q14(a)</td></tr>
<tr><td>5.</td><td>Surface Protective Materials</td><td>10</td><td rowspan="2">Q3</td><td>Q5,Q6</td><td>Q9(b), Q11(a),Q11(b)</td><td>Q13(b), Q15(a),Q15(b)</td></tr>
<tr><td>6</td><td>Timber, Plastics, Glass and Asbestos</td><td>15</td><td>Q7,Q8</td><td>Q10(b) Q12(a),Q12(b)</td><td>Q14(b) Q16(a),Q16(b)</td></tr>
<tr><td colspan="2">Total</td><td>75</td><td colspan="2">8</td><td colspan="2">8</td><td>8</td></tr>
</table>

Course Contents

UNIT-1: Stones and Sand **Duration : 10 Periods (L:8 – T:2)**

a) Classification of Rocks, physical classification only.
b) Characteristics of good building stone.
c) Common varieties of stones-granite, Marble, Kadapa slab, Shahabad stones.
d) Dressing of stones – purpose.
g) Characteristics of good sand.
h) Functions of sand.
i) Bulking of sand

UNIT-2: Bricks, tiles **Duration : 15 Periods (L:13 – T:2)**

a) Manufacture of bricks-Steps only.
b) ISI specification for bricks IS-1077-1971(sizes).
c) Characteristics of good bricks.
d) Testing of bricks as per IS-3495-1966 – tests on water absorption and compressive strength of bricks.
e) Tiles –Types of tiles- roofing tiles (Mangalore tiles), floor tiles, Ceramic tiles, Vitrified tiles, morbonite.

UNIT-3: **Cement** **Duration: 10 Periods (L:8 – T:2)**

a) Chemical composition of cement.
b) Method of manufacture of cement – Dry process (Flow chart only).
c) Classification of cement – ordinary Portland cement, quick setting cement, white cement – Rapid hardening cement, Low heat cement, High alumina cement, Blast furnace slag cement and Pozzolana cement and their uses of cement in appropriate situations
d) Tests for cement as per ISI – fineness, consistency, setting time, soundness tests.

UNIT-4: **MORTAR AND CONCRETE** **Duration: 15 Periods (L:12 – T:3)**

a) Define Fine aggregate and course aggregate
b) Mortar – List Classification of mortar –Cement mortar, Surkhi Mortar, Blended mortar.
c) Different proportions of mortars for various works.
d) Preparation of cement mortar.
e) Proportioning – usual proportions for different items of work-C.C. bed, Footings, Columns, Slabs & Beams for ordinary buildings.
f) Ingredients of Plain concrete and reinforced concrete.
g) water cement ratio – Factors effecting water cement ratio.
h) Workability – Slump test on fresh concrete, hardened concrete – compressive strength test on hardened concrete.
i) Admixtures –types -Plasticizers, Pozzolanas .
j) Method of preparation of concrete – Hand and machine mixing.
k) Procedure of mixing, conveyance, placing, compaction and curing of concrete. m) Curing – methods – suitability
l) Introduction to ready mix concrete – Advantages and disadvantages.
m) Use of fly ash, robo sand.

UNIT 5:Surface Protective Materials **Duration: 10 Periods(L:8 – T:2)**

a) Definition & types of surface protective materials - Paints, enamels, varnishes.
b) Characteristics of good paint.
c) Uses of surface protective materials like Paints, Enamels, Varnishes, Distempers, Emulsion, French polish and Wax Polish.

UNIT 6: Timber, Plastics, Glass and Asbestos **Duration: 15 Periods(L:10 – T:5)**

a) Characteristics of good timber.
b) Seasoning of timber - Importance.
c) Common varieties of timber available in Telangana and their uses.
d) Wood products-veneer - Ply wood, particle board, laminated board, straw board - Eco board.
e) Plastics -Types and uses of plastics.
f) Define asbestos and its uses.
g) Composition of glass, types and uses.

Reference Books

1. Engineering Materials by S C Rangwala
2. Building materials by Kulakarni
3. Construction materials by N.Sreenivasulu
4. Building Materials by Duggal S. K.
5. Building Material & Construction by S.P. Arora& S. P. Bindra
6. Construction Technology by Sarkar Oxford University Press
7. Building materials & components by C B R I
8. National Building code by N.B.C
9. Building Construction by Sushil Kumar
10. Building Construction by S. C. Rangawala
11. SP20 Explanatory handbook on Masonry code

Suggested E-learning references

1. http://nptel.ac.in
2. https://www.youtube.com/watch?v=nMIl3krK-GI
3. https://www.youtube.com/watch?v=6OAHO9zgeXM
4. https://www.youtube.com/watch?v=j1bL_1NBvIc
5. https://www.youtube.com/watch?v=cQGDP8kWEMM
6. https://www.youtube.com/watch?v=rh1Z-i14-h0
7. https://www.youtube.com/watch?v=veF4uSUtrEY
8. https://www.youtube.com/watch?v=USat6LdENzU
9. https://www.nicee.org/EOTips.php

Suggested Learning Outcomes

After completion of the course, the student shall be able to

CO1 - Explain the origin, types and uses of building stones, characteristics of good building stones used in construction, varieties of stones available along with their uses, purpose of dressing of stones. Sand function as a building material.

1.1 State the classification of rocks – Physical classification only.
1.2 State the characteristics of good building stone.
1.3 State the common varieties of stone used in different items of construction and their suitability for construction works – Granite, marble, Kadapa slabs, Shahabad stones.
1.4 Explain the purpose of dressing stones.
1.5 State the characteristics of good sand.
1.6 State the functions of building sand.
1.7 Explain the importance of bulking of sand.

CO2 - Steps involved in manufacture of bricks used for Construction, its characteristics, types of tiles used in construction along with methods of testing building materials.

2.1 List the steps involved in the manufacture of bricks.
2.2 Common sizes of bricks – IS specifications.
2.3 State the characteristics of good bricks.
2.4 State the standard tests for bricks
2.5 Explain water absorption test and compressive strength test on bricks
2.6 State the common variety of tiles used for different purposes.
2.7 State the characteristics of good tiles.

CO3 - State and explain method of using different types of cement, classification of cement based on its use, standard tests procedures done on cement.

3.1 State the chemical composition of cement.
3.2 State the steps in the manufacture of cement by dry process using flowchart.
3.3 State the classification of cements and their uses.
3.4 State and explain tests on cement for fineness, consistency, setting times and soundness of cement.
3.5 State grades of cement and their compressive strengths.

CO4 - State and explain method of using different types of cement mortar and cement concrete after testing their quality by standard procedures.

4.1 Understand the terms fine aggregate and coarse aggregate.

4.2 State the types of mortars.

4.3 State the different proportions of mortars for various works.

4.4 Explain the method of preparation of cement mortar

4.5 State the ingredients of plain and reinforced concrete.

4.6 State the usual proportions of plain and reinforced concrete for different items of work.

4.7 Define and explain the importance of Hydration of cement and water cement ratio.

4.8 Explain the method of preparing concrete.

4.9 State the steps involved in the procedure of mixing, conveyance, placing, compaction and curing of concrete.

4.10 State the need of curing and list the methods of curing suitable for different purposes

4.11 Define workability and explain the method of conducting Slump test and Compressive strength test

4.12 State the definition and types of admixtures in concrete.

4.13 Explain ready mix concrete and state the advantages and disadvantages.

4.14 State the uses of Fly ash and Robo sand.

CO5 - Types and uses of surface protective materials like Paints, Enamels, Varnishes, Distempers, Emulsion, French polish and Wax Polish

5.1 Define Paints, enamels, varnishes.

5.2 Characteristics of good paint.

5.3 List out types and uses of surface protective materials like Paints, Enamels, Varnishes, Distempers, Emulsion, French polish and Wax Polish.

CO6 - Comprehend timber as construction material, wood products, glass, plastic, asbestos

6.1 State the characteristics of good timber.

6.2 State the importance of seasoning.

6.3 Name the common varieties of timber used in Telangana for various Civil Engineering work.

6.4 State the types and uses of wood products used in construction work.

6.5 Define plastic, explain about fibre reinforced plastic

6.6 Define asbestos along with its uses.

6.7 Write composition of glass.

6.8 Mention types of glass and their uses.

Suggested Student Activities

1. Identify different types of construction materials available in market and study their properties
2. Collect and study different photographs of various foundations and prepare a report.
3. Collect and study different photographs of stairs.
4. Collect and study the different types of Damp Proofing materials and prepare a report.
5. Prepare models of various types of foundations.
6. Prepare models of different types of roof trusses.
7. Visit any nearby material testing laboratory and prepare a report on various tests conducted on building materials.
8. Prepare a report on prefabricated construction.
9. Prepare a report on the use of modern construction equipment in construction.
10. Tech fest/Srujana
11. Paper/Poster presentation
12. Quiz
13. Group discussion
14. Surprise Test

CO-PO Mapping Matrix

	Basic and Discipline Specific Knowledge	Problem Analysis	Design/Development of solutions	Engineering Tools Experimentation and	Engineering Practices for Society Sustainability and	Project Management	Lifelong Learning	Linked PO
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	
CO1	1	1	1	-	1		2	1,2,3,5,7
CO2	1	1	1	-	1		2	1,2,3,5,7
CO3	1	1	1	-	1		2	1,2,3,5,7
CO4	2	1	1	-	1		2	1,2,3,5,7
CO5	1	1	1	1	1		2	1,2,3,4,5,7
CO6	2	1	1	1	1		2	1,2,3,4,5,7

QUESTION PAPER PATTERN FOR SEMESTER END EXAM

Sl.No	Description	Level	No of Questions	Marks for each question	Choice	Total Marks
01	Part -A	Remembering(R)	8	1	NIL	8 Marks
02	Part -B	Understanding(U)	8	3	4	12 Marks
03	Part -C	Application(A)	8	5	4	20 Marks
Total Marks						40 Marks

Unit No	Questions to be set foe SEE				
		R		U	A
I	Q4	Q1		Q9(a)	Q13(a)
II		Q2		Q9(a)	Q14(a)
III		Q3		Q9(a)	Q13(b)
IV			Q5,Q6	Q11(a),Q11(b)	Q15(a),Q15(b)
V			Q7,Q8	Q10(b)	Q14(b)
VI				Q12(a),Q12(b)	Q16(a),Q16(b)
Total Questions	8			8	8

State Board of Technical Education and Training, Telangana

Model Question paper

DCE I semester Mid Semester-I Examination

Course Code : CE-106 **Duration : 1 hour Course Name: Building Materials** **Max.Marks:20 Marks**

PART-A

Answer **ALL** questions, Each Question carries one mark 4x1 = 4 Marks

1) State physical classification of rocks .

2) Mention the size of Sand used in construction

3) List the steps involved in manufacture of bricks.

4) Mention the standard size of bricks used in construction site.

PART-B

Answer **TWO** questions. Each question carries three marks 2x 3 = 6 Marks

5(a) Write the names of common types of stones used in Telangana.

(i) For flooring (ii) As a Road metal (iii) for architectural appearance

(or)

5(b) Define bulking of Sand along with its importance in construction site.

6(a) List any three laboratory tests done on bricks.

(or)

6(b) List any three roof tiles and floor tiles.

PART-C

Answer **TWO** questions. Each question carries five marks 2x 5 = 10 Marks

7(a) State five important characteristics of good building stones.

(or)

7(b) Explain the properties and uses of granite stone.

8(a) State the characteristics of good building bricks.

(or)

8(b) Explain the compressive strength test done on bricks.

State Board of Technical Education and Training, Telangana
Model Question paper
DCE I semester Mid Semester-II Examination

Course Code: CE-106 **Duration:1 hour**
Course Name: Building Materials **Max.Marks:20 Marks**

PART-A

Answer **ALL** questions, Each Question carries one mark **4x1= 4 Marks**

1. Mention standard values for any three properties of Ordinary Portland Cement.
2. Name the test conducted on cement for testing proper grinding of cement material.
3. State ingredients of P.C.C.
4. What is the size of Coarse aggregate used in P.C.C and R.C.C.

PART-B

Answer **TWO** questions. Each question carries three marks **2x 3 = 6 Marks**

5(a) State the composition of cement

(or)

5(b) List any two tests conducted on cement in laboratory.

6(a) Define mortars. Explain any one.

(or)

6(b). Define water cement ratio and write two factors effecting water cement ratio.

PART-C

Answer **TWO** questions. Each question carries five marks **2x 5 = 10 Marks**

7(a) State the steps in manufacture of cement by dry process..

(or)

7(b) Explain the procedure for conducting compressive strength of cement

8(a) Define workability of concrete and explain the procedure of conducting slump test.

(or)

8(b) Explain the procedures involved in Hand mixing and Machine mixing of cement concrete

State Board of Technical Education and Training, Telangana
Model Question paper
DCE III semester
Semester End Examination

Course Code:CE-106 **Duration:2 hour**
Course Name: Building Materials **Max. Marks: 40 Marks**

PART-A

Answer **ALL** questions **8x1 =8 Marks**

1) Define 'dressing of stones'.
2) list any two tests conducted on cement.
3) State ingredients of paint.
4) Define Workability of cement.
5) list any two types of Paints.
6) Mention the uses of French polish and wax polish.
7) Define seasoning of Timber.
8) Name any four varieties of timber used in Telangana.

PART-B

Answer **FOUR** questions. Each question carries **three** marks. **4 x 3 = 12 Marks**

9(a) Define "Bulking of Sand". State the effects of bulking of sand on proportioning of concrete.

(or)

9(b) Mention three characteristics of good paint.

10(a) State chemical classification of cement.

(or)

10(b) Define plastic and its uses as construction material.

11(a) list types of varnishes with its uses.

(or)

11(b) list different types of distempers with its uses.

12(a) define asbestos and its uses products

(or)

12(b) State three characteristics of good timber and mention two common defects in timber.

PART-C

Answer **FOUR** questions. Each question carries marks**4 x 5 = 20 Marks**

13(a) What is meant by water-cement ratio? Explain the ill effects of increased and decreased water-cement ratio on workability and strength of concrete

(or)

13(b) Write any three uses of paints and varnishes.

14(a) Explain tests to be conducted on cement to determine its normal consistency.

14(b) State any five characteristics of good timber.

15(a) Explain different types of paints and also mention the situations where they used.

(or)

15(b) Write characters of good paint.

16(a) List any five common varieties of timber used in Telangana with two uses of each.

(or)

16(b) State the uses of Veneer and Plywood in construction works.

ME-

CE-108-BASIC SURVEYING LAB

Course Title:	Basic Surveying Lab	Course Code :	CE-108
Semester:	I Semester	Course Group :	Practical
Teaching Scheme in Periods (L:T:P):	15:0:30	Credits :	1.25
Methodology :	Lecture + Practical	Total Contact Periods :	45 Periods
CIE :	60 Marks	SEE :	40 Marks

Pre requisites

This course requires the basic knowledge of Trigonometry and basics of map study

Course Outcomes

Upon completion of the course, the student shall be able to

CO1 :	Employ standard practices to perform different operations of Chain Surveying in the field
CO2 :	Distinguish the types of measurements and select suitable method for measurement of a line
CO3 :	Perform the ranging types and able to mark offsets from a chain line
CO4 :	Develop and draw the traverse and calculate the areas of the given irregular boundary by different methods of chain surveying
CO5 :	Apply principles and practices of Compass Surveying to perform traversing in the field
CO6 :	Plot the closed traversing using compass and adjust for errors by using Bowditch rule

Course Contents

Unit No	Unit Name	Hours/Periods
1	Basic operations of Chain Surveying	15
2	Chain Triangulation and Introduction to Compass Surveying	15
3	Traversing and error calculations	15
	Total	45

Course Content

UNIT 1: Basic operations of Chain Surveying Duration: 15 Periods (L:5-P:10)

a) Practice unfolding and folding of a chain.
b) Ranging and chaining of lines on level ground and recording in field book to measure the distance between two stations.
c) Chaining a line involving indirect ranging.
d) Setting and measuring the offsets-Perpendicular and Oblique offsets

UNIT 2: Chain Triangulation and Introduction to Compass Surveying
Duration: 15 Periods (L:5-P:10)

a) Measurement of land areas -cross staff survey
b) Chain triangulation around the building covering a small area with other details taking offsets and recording.
c) Setting up the compass - observations of bearings
d) Calculation of included angles from the observed bearings

UNIT 3: **Traversing and error calculations Duration: 15 Periods (L:5-P:10)**

a) Traversing with prismatic compass and chain - Open Traverse.
b) Traversing with prismatic compass and chain- Closed traverse.
c) Plotting the closed traverse from field data & adjust for closing error-Bowditch rule.
d) Measurement of bearings of sides of traverse with prismatic compass and computation of correct included angle

Reference Books

1. Surveying - N.N.Basak - Tata McGraw Hill
2. Surveying Vol-I - S.K.Duggal -McGraw Hill Edn (India) Pvt Ltd
3. Surveying and Levelling Vol -1 -Kulkarni and Kanetkar
4. Surveying and Levelling Vol. - 1 - B.C. Punmia
5. Surveying and Levelling -Vol -1 -R.Agor- Khanna Publishers

Suggested Learning Outcomes

Upon completion of the course, the student shall be able to

CO1 Employ standard practices to perform different operations of Chain Surveying in the field

CO2 Distinguish the types of measurements and select suitable method for measurement of a line

2.1 Practice unfolding and folding a chain.
2.2 Perform direct ranging on level ground and measure the distance between two given stations and record the measurements in the field book
2.3 Perform indirect ranging and measure the distance between two given stations when a high ground intervenes to prevent inter visibility of ends of line.
2.4 Set out a right angle to a given chain line by using chain only.
2.5 Set and measure offsets for a given chain line by
1. Perpendicular offsets 2. Oblique offsets.

CO3 Perform the ranging types and able to mark offsets from a chain line

CO4 Develop and draw the traverse and calculate the areas of the given irregular boundary by different methods of chain surveying

4.1 Perform triangulation survey of a given area with chain and cross staff and record all necessary nearby details.
4.2 Calculate the area bounded by the given points by chain triangulation
4.3 Identify the parts of a prismatic Compass
4.4 Set up the compass at a station and carry out temporary adjustments.
4.5 Take bearings of two points from instrument station and calculate the included angle.

CO5 Apply principles and practices of Compass Surveying to perform traversing in the field

CO6 Plot the closed traversing using compass and adjust for errors by using Bowditch rule

6.1 Perform an open compass survey with Compass and Chain.
6.2 Perform a closed traverse with compass and chain.
6.3 Calculate the included angles of a closed traverse.
6.4 Plot the closed traverse from field data and adjust for closing error by Bowditch rule.
6.5 Calculate the errors and adjusting them by using various methods.

Suggested Student Activities

1. Measuring the precise length of line on plane and sloped grounds
2. Perform Direct and indirect ranging to plot an intermediate point
3. Conduct Chain Triangulation survey around the main building of the institute
4. Compute the area of the given ground by compass survey and plot it
5. Conduct a survey camp to familiarize with practical procedures of Chain and compass survey
6. Conduct a open and closed traverse survey and adjusting errors in traverse.

CO-PO Mapping Matrix

	Basic and Discipline Specific Knowledge	Problem Analysis	Design/Development of Solutions	Engineering Tools, Experimentation and Testing	Engineering Practices for Society, Sustainability and Environment	Project Management	Lifelong Learning	Linked PO
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO 7	
CO1	3	2	1	3	-	3	1	1,2,3,4,5,7
CO2	3	2	2	3	3	3	1	1,2,3,4,5,6,7
CO3	3	2	1	3	3	3	3	1,2,3,4,5,6,7
CO4	3	1	3	3	3	3	3	1,2,3,4,5,6,7
CO5	3	2	1	3	3	3	3	1,2,3,4,5,6,7
CO6	3	1	2	3	3	3	3	1,2,3,4,5,6,7

State Board of Technical Education and Training, Telangana
Mid Sem-I Model Question Paper
DCE I semester

Course Code:CE-108 **Duration:1 hours**
Course Name: Basic Surveying Lab **Max.Marks:20 Marks**

Instructions to the Candidate:
(i)Answer any One of the following Questions.
(ii) Plot the details of field work for illustration and conclude your observation of the experiment

1) Carry out unfolding and folding of given chain as per the standard procedure
2) Measure the distance between two stations by ranging and chaining of lines on level ground and record in field book
3) Find out the distance between given points using indirect ranging
4) Set out perpendicular offset from a main line using chain surveying.

State Board of Technical Education and Training, Telangana
Mid Semester-II Model Question paper
DCE I semester

Course Code:CE-108 **Duration:1 hour**
Course Name: Basic Surveying Lab **Max.Marks:20 Marks**

Instructions to the Candidate:
(i)Answer any One of the following Questions.
(ii) Plot the details of field work for illustration and conclude your observation of the experiment

1) Measure the area of given land using cross staff and chain surveying.
2) Perform Chain Triangulation survey around the given building and plot the details
3) Calculate the angle between two points using primatic compass
4) Calculate the included angles from the observed bearings using compass
5) Perform temporary adjustments in a compass survey

State Board of Technical Education and Training, Telangana
Semester End Examination Model Question paper
DCE I semester

Course Code:CE-108 **Duration:2 hours**
Course Name: Basic Surveying Lab **Max.Marks:40 Marks**

Instructions to the Candidate:

(i)Answer any One of the following Questions.

(ii) Plot the details of field work for illustration and conclude your observation of the experiment

1. Carry out unfolding and folding of given chain as per the standard procedure
2. Measure the distance between two stations by ranging and chaining of lines on level ground and record in field book
3. Find out the distance between given points using indirect ranging
4. Measure the area of given land using cross staff
5. Marking a shape in field using given measurements using chain.
6. Obtain a perpendicular offset for a chain line using any method.
7. Perform Chain Triangulation survey around the given building and plot the details
8. Perform the temporary adjustments in a compass survey
9. Conduct Compass Open traversing with a prismatic compass for the given road
10. Conduct Compass Closed traversing with a prismatic compass for the given area and adjust the closing error
11. Calculate the area of given land by method of radiation using prismatic compass
12. Determine the distance between two inaccessible points using compass
13. Conduct Compass Open traversing with a prismatic compass for the given land
14. Conduct Compass Closed traversing with a prismatic compass and finding the error in a traverse
15. Conduct Compass Closed traversing with a prismatic compass and finding the error in a traverse and adjusting the error using bowditch rule

SC-109-BASIC SCIENCE LAB

Course Title	Basic Science Lab	Course Code	SC-109
Semester	I Semester	Course Group	Practical
Teaching Scheme in Periods (L:T:P)	15:0:30	Credits	1.25
Type of course	Lecture + Practical	Total Contact Periods	45 Periods
CIE	60 Marks	SEE	40 Marks

SC-109A - PHYSICS LAB

Pre requisites:

This course requires the basic knowledge of Science and Mathematics.

Course Outcomes

On completion of the course, the student shall be able to

CO1	Demonstrate the principle of Screw Gauge and calculate accurate measurement of thickness of glass plate and area of cross section of a wire.
CO2	Make use of laws of vector addition to verify Parallelogram law of forces and Triangle law of forces.
CO3	Determine the coefficient of friction between wood and wood and wood and glass surfaces on horizontal plane.
CO4	Calculate coefficient of viscosity of a liquid by capillary method.
CO5	Make use of Quill tube to verify Boyle's law.
CO6	Calculate the surface tension of water using capillary rise method. (Demonstration only)

	Basic and Discipline Specific Knowledge	Problem Analysis	Design/Development of Solutions	Engineering Tools, Experimentation and Testing	Practices Engineering Practices for Society, Sustainability and	Project Management	Lifelong Learning	Linked PO
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO 7	
CO1	3					1	1	1,6,7
CO2	3					1	1	1,6,7
CO3	3					1	3	1,6,7
CO4	3					1	3	1,6,7
CO5	3					1	3	1,6,7

Learning outcomes

On successful completion of the course, the student will have ability to:

1. Demonstrate the principle of Screw Gauge and calculate accurate measurement of thickness of glass plate and area of cross section of a wire.
2. Make use of laws of vector addition to verify Parallelogram law of forces and Triangle law of forces.
3. Determine the coefficient of friction between wood and wood and wood and glass on horizontal plane.
4. Calculate coefficient of viscosity of a liquid by capillary method.
5. Make use of Quill tube to verify Boyle's law.

Demonstration Experiment:

1. Calculate the surface tension of water using capillary rise method.

Course Delivery:

The course will be delivered through lectures, class room interaction, group discussions, graded exercises, demonstration and practice.

Tutorial: 1Period /Experiment:

1. Introduction to Physics practical and its importance, safety precautions in maintenance of equipment in the laboratory.
2. Maintenance of apparatus and equipment.
3. Follow of Do's and Don'ts.
4. Maintenance of data in manual and record book.
5. Write the procedure of the experiment before the commencement of each experiment.
6. Strictly following of instructions given from time to time by the lecturer-in-charge.
7. Demonstration of each experiment by the lecturer in charge.

Conduction of experiments: 2 periods/Experiment.

Student must perform experiment individually under the supervision of the lecturer-in charge.

Scheme of Valuation of SEE		
S.No	**Particulars**	**Marks**
1.	Objective/Aim	01
2.	Apparatus/Equipment	02
3.	Observations	02
4.	Principle including formula	02
5.	Experiment (Tabular form, readings, etc)	05
6.	Calculation and Result	05
7.	Viva Voce	03
	Total	**20**

References:

1. Intermediate Physics lab manual – Telugu Academy
2. Laboratory manual for class XI and XII – NCERT

SC-109B - CHEMISTRY LAB

Prerequisite: Knowledge of basic concepts of Chemistry of secondary education

Course Objectives: To provide practical knowledge about the basics of preparation of chemical solutions and volumetric analysis of chemical compounds.

Course Outcomes: On successful completion of the course, the student will have ability to attain

CO:

Course Outcome	
CO1	Prepare the primary standard solution to find out the concentrations of unknown solution.
CO2	Estimate the amount of the HCl in the given sample of solutions by volumetric analysis.
CO3	Estimate the amount of the NaOH in the given sample of solutions by volumetric analysis.
CO4	Find the pH of the unknown solutions collected from different industrial areas and recommend a remedial action.
CO5	Determine the hardness of water sample and recommend a solution for identified hardness

CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**
CO1	3	-	-	1	-	1	1
CO2	3	-	-	-	-	1	1
CO3	3	-	-	-	-	1	1
CO4	3	-	-	2	2	1	1
CO5	3	-	-	-	2	1	1

Course Delivery:

The course will be delivered through lectures, classroom interactions, group discussions, demonstrations and practicals.

Conduction of experiments: Lecture 1 period + Experiment 2 periods.

Student must conduct experiment individually under the supervision of the staff -in-charge.

Lecture and Demonstration: 1 Period

1. Introduction of chemistry practical and its importance, safety precautions in maintenance of cleanliness and orderliness of chemicals in the laboratory.
2. Maintenance of apparatus and equipment.
3. Follow of Do's and Don'ts.
4. Maintenance of data in record book.
5. Write the procedure of the experiment before the commencement of each experiment.
6. Strict following of instructions given from time to time by the staff-in-charge.
7. Demonstration of each experiment by the staff in charge.

Course Content

Volumetric Analysis: (22.5 Periods)

Volumetric Analysis by Titrimetric Method:

Volumetric Analysis -Titration – Standard Solutions - Concentration of solutions -Indicators - Acid base indicators - Selection of indicators – Endpoint of titration- Neutralization- Harness of water

List of experiments:

1. Preparation of primary standard solution.
2. Estimation of hydrochloric acid by using standard basic solution
3. Estimation of sodium hydroxide by using standard acidic solution.
4. Standardisation of disodium salt of EDTA using standard magnesium sulphate solution.
5. Determination of total hardness of water sample by EDTA method.

Specific Learning Outcomes

Upon completion of the course, the student will have ability to

1. Prepare standard sodium carbonate solution and dilute to desired concentration.
2. Estimate hydrochloric acid present given volume of solution by using standard sodium carbonate solution.
3. Estimate sodium hydroxide present in the given volume of solution by using standard hydrochloric acid solution.
4. Standardisation of disodium salt of EDTA using standard magnesium sulphate solution.
5. Determine the total hardness of water sample by using 0.02N disodium salt of EDTA solution.

Reference Books:

1. Vogel's Inorganic Qualitative and Quantitative Analysis.
2. Practical chemistry by O.P. Pande & others.
3. Intermediate Chemistry Lab manual- Telugu academy (Telangana state)

Scheme of Valuation for SEE		
Sl. No.	**Particulars**	**MARKS**
1	Identification of apparatus/equipment/chemical compounds/tools/etc.	2
2	Writing Principle and Procedure	5
3	Experiment and Observations	6
4	Calculation and Results	4
5	Viva-voice	3
Total		**20**

BOARD DIPLOMA EXAMINATION, (C-24)
MIDSEM – I
FIRST SEMESTER EXAMINATION
SC-109 - BASIC SCIENCE LAB

TIME: 1 Hour **TOTAL MARKS: 20**

Instructions: (1) Answer both PART-A AND PART-B on **separate** answer sheets.

(2) Each question carries **TEN** marks.

PART-A (PHYSICS LAB)

Perform ONE experiment allotted by the examiner. 1 x 10 = 10

1. Determine the thickness of given glass plate using Screw gauge.
2. Find the cross sectional area of given wire using Screw gauge.
3. Verify parallelogram law of forces.
4. Verify triangle law of forces.

PART-B (CHEMISTRY LAB)

Perform ONE experiment allotted by the examiner. 1 x 10 = 10

1. Prepare 250ml of 0.05M sodium carbonate solution.
2. Estimate the amount of hydrochloric acid present in 500ml of the given solution using 0.02M sodium carbonate solution.
3. Estimate the amount of hydrochloric acid present in 250ml of the given solution using 0.05M sodium carbonate solution.

BOARD DIPLOMA EXAMINATION, (C-24)
MIDSEM – II
FIRST SEMESTER EXAMINATION
SC-109 - BASIC SCIENCE LAB

TIME: 1 Hour **TOTAL MARKS: 20**

Instructions: (1) Answer both PART-A AND PART-B on **separate** answer sheets.

(2) Each question carries **TEN** marks.

PART-A (PHYSICS LAB)

Perform ONE experiment allotted by the examiner. 1 x 10 = 10

1. Determine the coefficient of friction between wooden surface and wooden block.
2. Determine the coefficient of friction between glass surfaces and wooden block.
3. Determine coefficient of viscosity of water using capillary method.

PART-B (CHEMISTRY LAB)

Perform ONE experiment allotted by the examiner. 1 x 10 = 10

1. Estimate the amount of NaOH present in500 ml solutionusing0.02MHCl solution
2. Estimate the amount of NaOH present in 750ml solution using 0.02M HCl solution
3. Find out the Normality of EDTA solution using 0.02N $MgSO_4$ solution

BOARD DIPLOMA EXAMINATION, (C-24)
SEMESTER END EXAMINATION
FIRST SEMESTER EXAMINATION
SC-109 - BASIC SCIENCE LAB

Time: 2 Hours] [Total Marks: 40

Instructions: (1) Answer both PART-A AND PART-B on **separate** answer sheets.
(2) Each question carries **TWENTY** marks.

PART-A (PHYSICS LAB)

Perform ONE experiment allotted by the examiner. 1 x 20 = 20

1. Determine the thickness of given glass plate using Screw gauge.
2. Find the cross sectional area of given wire using Screw gauge.
3. Verify parallelogram law of forces.
4. Verify triangle law of forces.
5. Determine the coefficient of friction between wooden surface and wooden block.
6. Determine the coefficient of friction between glass surfaces and wooden block.
7. Determine coefficient of viscosity of water using capillary method.
8. Verify Boyle's law using Quill tube.

PART-B (CHEMISTRY LAB)

Perform ONE experiment allotted by the examiner. 1 x 20 = 20

1. Prepare 250ml of 0.05M sodium carbonate solution.
2. Estimate the amount of hydrochloric acid present in500ml of the given solution using 0.02M sodium carbonate solution.
3. FindtheMolarityandestimatetheamountofNaOHpresentin100mlofthegivensolution using0.01M HCl solution.
4. Find out the Normality of EDTA solution using 0.02N $MgSO_4$ solution
5. Determine the total hardness of the given water sample using 0.02N EDTA solution.

CS-110-COMPUTER FUNDAMENTALS LAB

Course Title:	Computer Fundamentals Lab	Course Code	CS-110
Semester	I Semester	Course Group	Practical
Teaching Scheme in Periods (L:T:P)	1:0:2	Credits	1.25
Methodology	Lecture + Tutorials	Total Contact Periods	45
CIE	60 Marks	SEE	40 Marks

Pre-requisite: The students should have basic knowledge of English

Pre-requisite: The students should have basic knowledge of using computer

COURSE OUTCOME

CO1	Creating and saving a document, Formatting of text in MS-WORD
CO2	Spell checking, Mail merging and Printing of Documents in MS-WORD
CO3	Creating and Saving a presentation, inserting text and pictures & Formatting the text and pictures, Slide transition and Animation effects in MS-POWER POINT
C04	Building Worksheet & Charts In Ms-Excel and Printing Of Worksheet
C05	Creating Database, Tables, Forms, Queries, Reports In Ms-Access

Course Contents

Unit-I: Creating, saving a document, Formatting of text in MS-WORD Duration: 5 hrs

MS_WORD - Creating and saving a document, Formatting of text

Unit-II: Spell checking, Mail merging and Printing of Documents in MS-WORD MS Word Duration: 10 hrs

MS-WORD - Spell Checking - Mail merging – Printing of Documents

Unit-III: Creating and saving a presentation in MS PowerPoint and Slide transition and Animation effects Duration: 10 hrs

MS-POWER POINT - Creating and saving a presentation - Inserting text and pictures - Formatting the text and pictures- MS-POWER POINT - Effects of slide transition - Animation effects - Slide show & views of slides

Unit-IV Building & Charts in MS-Excel and Printing Of Worksheet Duration: 10 hrs

Building Worksheets – Building Charts, Printing EXCEL Worksheet

Unit-V Creating Database, Tables, Queries, Forms, Reports & Printing Duration: 10 hrs

Creating Table, Viewing (ACCESS) – Creating Forms – Creating Queries and Viewing Database Creating of ACCESS Reports – Printing of ACCESS Tables, Forms, Reports

Specific Learning Outcomes:

CO1: Creating and saving a document, Formatting of text in MS-WORD

1.1 Demonstrate starting MS word.
1.2 Identify the word screen elements.
1.3 Identify the tool bars on the screen.
1.4 Demonstrate loading different tool bars for their functionality.
1.5 Identify the drop down menus of the main menu and their functionality.
1.6 Demonstrate creating a sample text.
1.7 Demonstrate text formatting.
1.8 Demonstrate page formatting.
1.9 Demonstrate selecting, deselecting the text from menu and Copying.
1.10 Demonstrate importing text from other packages.

CO2: Spell checking, Mail merging and Printing of Documents in MS-WORD

2.1 Demonstrate search and replace of text.
2.2 Demonstrate spell checking.
2.3 Demonstrate creating tables.
2.4 Demonstrate mail merging of documents.
2.5 Demonstrate printing documents, merge printing of documents.
2.6 Demonstrate word procedure for importing figures, charts from other installed software.

CO2: Creating and Saving a presentation, inserting text and pictures & Formatting the text and pictures, Slide transition and Animation effects in MS-POWER POINT

3.1 Demonstrate starting MS Power Point.
3.2 Identify the opening screen elements.
3.3 Identify the tool bars in the opening screen.
3.4 Demonstrate the selection of the methods of creating a new presentation.
3.5 Identify the different Auto Layouts of a slide.
3.6 Demonstrate creating a new slide
3.7 Demonstrate inserting a new slide.
3.8 Demonstrate slide transition effects.
3.9 Demonstrate a slide show.
3.10 Demonstrate animation effects.
3.11 Demonstrate creating an organization chart.
3.12 Identify the different slide views.

CO4: Building Worksheet & Charts In Ms-Excel and Printing Of Worksheet

4.1 Start EXCEL from the start
4.2 Identify the various parts of the window.
4.3 Identify the tabs and groups in ribbon layout
4.4 Identify and customizing the quick access toolbar
4.5 Identify the office button and commands of the drop down menu.
4.6 Practice loading of the existing worksheet or create a new worksheet.
4.7 Practice entering into the worksheet.
4.8 Practice formatting the cells.
4.9 Practice formatting the texts in the cells.
4.10 Practice changing the height and width of the cells.
4.11 Practice freezing the rows, columns.
4.12 Practice splitting the screens.
4.13 Enter formulas into the cells.
4.14 Enter formulas with built in functions.
4.15 Create a range name for the cells for group operations.
4.16 Create graph for the data in the worksheet.

CO5: Creating Database, Tables, Forms, Queries, Reports In Ms-Access

5.1 Practice loading Ms Access from the start menu.
5.2 Create a database table using Database Wizard.
5.3 Enter data into the table.
5.4 Edit data in the table.
5.5 View data from the database.
5.6 Design a query.
5.7 View data using the query.
5.8 Demonstrate creating Forms.
5.9 View the database through Forms.
5.10 Practice navigating through the database through Forms.
5.11 Practice creating Custom Form using Forms Wizard.
5.12 Practice creating Reports using the Report Wizard.
5.13 Practice printing the tables, forms and reports.

EXERCISES

1. Create and save a document using MS WORD.
2. Format the Text document.
3. Change the page set-up and Insert Header/Footer.
4. Spell checking in the document.
5. Print the document.
6. Create main document and data file for mail merging.
7. Print the document with mail merging.
8. Create a table in the document.
9. Add row, column to a table.
10. Create and save a new presentation using MS Power Point.
11. Choose Auto Layout for a new slide.
12. Inserting text and pictures into a blank slide.
13. Inserting new slides into the presentation.
14. Applying slide transition effects.
15. Demonstrate a slide show.
16. Set animation to text and pictures in a slide.
17. Set the sounds, order and timing for animation.
18. Create and save a new work book in Excel
19. Operating Mouse to selecting tabs, groups, cells, group of cells
20. Entering and editing Data into Worksheet
21. Formatting the text in the cells
22. Formatting the numbers in the cells.
23. Changing the height and width of cells.
24. Freezing Titles, splitting screen
25. Enter formulae for calculation in the cells.
26. Copying the formula over a range of cells.
27. Inserting built-in functions in to the cells.
28. Create graphs for the data using Chart Wizard.
29. Practice Data Forms in Excel.
30. Printing of worksheet
31. Creating Tables using wizard in Access
32. Creating Tables using Design View in Access.
33. Entering Data into tables
34. Viewing the data in table.
35. Creating a new query using wizard.
36. Creating a new query using design view.
37. Viewing the data using a Select Query.
38. Updating the data in table using Update Query.

39. Linking two Tables on Relational Aspect.
40. Create forms using Form Wizard.
41. Create reports using Report Wizard.
42. Printing the tables, forms and reports

Suggested Student Activities

1. Student visits Library to refer to Manual for the specifications
2. Student inspects the available equipment in the Lab to identify the components
3. Visit nearby Industry to familiarize with fabrication techniques
4. Analyze the connections in the UPS available in the Institution facility
5. Quiz , Group discussion, Surprise test

RECOMMENDED BOOKS:

1. Teach yourself Office 2007 for Windows – Coray Sandler, Tom Badgett, Jan Weingarten, BPB Publications.
2. The ABC s of MS Office 2007– Guy Hard-Davis, BPB Publications.
3. Working in MS Office - Ran Mansfield, Tata McGraw Hill Publications.

Student E-Learning reference

1. https://www.tutorialspoint.com/word/index.htm
2. https://www.tutorialspoint.com/powerpoint/index.htm

CO-PO Mapping Matrix

	Basic and Discipline Specific Knowledge	Problem Analysis	Design/Development of Solutions	Engineering Tools, Experimentation and Testing	Engineering Practices for Society, Sustainability and Environment	Project Management	Lifelong Learning	Linked PO
CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO 7**	**PO**
CO1	3	1						1,2
CO2	3	2	1					1,2,3
CO3	3	1						1,2
CO4	3	1	2	2				1,2,3,4
CO5	3	1	2	1				1,2,3,4

MODEL QUESTION PAPERS
STATE BOARD OF TECHNICAL EDUCATION & TRAINING:TS, HYDERABD
CS-110 Computer Fundamentals Lab
I-SEMESTER, MID -I MODEL PAPER

TIME: 1 hr MARKS: 20
ANSWER ANY ONE QUESTION.
EACH QUESTION CARRIES TWENTY MARKS. 20 x 1 = 20

1. Demonstrate Starting MS word and identify the word screen elements.
2. Draw and explain the groups and commands in Home tab under ribbon in Ms word.
3. Demonstrate text formatting in Ms word.
4. Demonstrate procedure for checking of spelling and grammar using dictionaries.
5. Demonstrate paragraph formatting in Ms word.
6. Draw and explain the groups and commands in page layout tab under ribbon in Ms word.
7. Demonstrate page formatting in Ms word.
8. Demonstrate procedure for creating Mail merging process in Ms word.
9. Demonstrate creating of table and adding rows and columns to the existing table in Ms word.
10. Demonstrate finding and replacing of text & searching for a bookmark.
11. Demonstrate starting of MS Power Point and identify the opening screen elements.
12. Draw and explain the groups and commands in Home tab under ribbon in MS Power Point.
13. Demonstrate different Auto Layouts of a Slide in MS Power Point.
14. Demonstrate Slide Transition effects in Ms Power Point.
15. Demonstrate different Animation effects in Ms Power Point.
16. Draw and explain the groups and commands in Animations tab under ribbon in MS Power Point.
17. Demonstrate different Slide views in MS Power Point.
18. Draw and explain the groups and commands in Review tab under ribbon in MS Power Point.
19. Demonstrate inserting and formatting of text and pictures in MS Power Point.

MODEL QUESTION PAPERS
STATE BOARD OF TECHNICAL EDUCATION & TRAINING: TS, HYDERABD
CS-110 Computer Fundamentals Lab
I -SEMESTER, MID -II MODEL PAPER

TIME: 1 hr MARKS: 20

ANSWER ANY ONE QUESTION.

EACH QUESTION CARRIES TWENTY MARKS. 20 x 1 = 20

1. Write procedure to open Excel window and Draw and label the parts in Excel window.
2. Draw and Write about groups and commands under Formulas tab under the ribbon in MS- Excel.
3. Write procedure to format the text in the cells.
4. Write procedure to enter formulas with built in functions.
5. Write procedure for creating chart in MS-excel.
6. Write Procedure for formatting numbers in MS-Excel.
7. Write procedure for writing criteria and extract the data.
8. Write procedure for printing of a worksheet.
9. Write procedure for formatting of chart in Ms-excel.
10. Write procedure to jump to different workbooks &import worksheet from different workbook.
11. Write procedure to create a database.
12. Write procedure to create a table using design view.
13. Write procedure to create form using forms wizard.
14. Write procedure for creating reports using report wizard.
15. Write procedure for creating a Custom Form.
16. Write the procedure to create custom reports.
17. Write the procedure to print active sheet.
18. Write the procedure for Printing of reports.
19. Draw and explain the groups and commands in create tab under ribbon in Ms access.
20. Write the procedure for creating Filter by form.

MODEL QUESTION PAPERS
STATE BOARD OF TECHNICAL EDUCATION & TRAINING:TS, HYDERABD
CS-110 Computer Fundamentals Lab
I-SEMESTER, END SEMESTER MODEL PAPER

TIME: 2hr MARKS: 40

ANSWER ANY ONE QUESTION.
EACH QUESTION CARRIES TWENTY MARKS.

20 x 1 = 20

1. Write procedure for Creating and saving a document and draw and label the different parts of opening screen elements in Ms word.
2. Draw and explain the groups and commands in Home tab under ribbon in MS Power Point.
3. Write procedure for applying sounds, order, timing and effects of animation in a presentation.
4. Write procedure for character formatting in Ms word.
5. Draw and explain the groups and commands in Home tab under ribbon in Ms word.
6. Write procedure for creating main document and data file for mail merging.
7. Write procedure for page formatting in Ms word.
8. Write procedure for checking spelling and grammar using dictionary in Ms word.
9. Write procedure for printing of document in Ms word.
10. Draw and explain the groups and commands in Animations tab under ribbon in MS Power Point.
11. Write procedure to open Excel window and Draw and label the parts in Excel window.
12. Draw and Write about groups and commands under Formulas tab under the ribbon in MS- Excel.
13. Write procedure to format the text in the cells.
14. Write procedure to enter formulas with built in functions.
15. Write procedure for creating chart in MS-excel.
16. Write Procedure for formatting numbers in MS-Excel.
17. Write procedure for writing criteria and extract the data.
18. Write procedure for printing of a worksheet.
19. Write procedure for formatting of chart in Ms-excel.
20. Write procedure to jump to different workbooks & import worksheet from different workbook.
21. Write procedure to create a database.
22. Write procedure to create a table using design view.
23. Write procedure to create form using forms wizard.
24. Write procedure for creating reports using report wizard.
25. Write procedure for creating a Custom Form.
26. Write the procedure to create custom reports.
27. Write the procedure to print active sheet.
28. Write the procedure for Printing of reports.
29. Draw and explain the groups and commands in create tab under ribbon in Ms Access.
30. Write the procedure for creating Filter by form.

Record book: 10 marks **Viva-voce: 10 marks**