COURSE FILE

ON

ENGINEERING CHEMISTRY

Course Code - CH203BS

I B. Tech Semester-II
A.Y. 2022-2023

Prepared by
K.MOUNIKA
Asst. Professor

Head of the Department
Department of H&S
SRI INDU INSTITUTE OF ENGG & TECH
Sheriguda(V), Ibrahimpatnam (M), R.R. Dist-501 510

PRINCIPAL
Sri Indu Institute of Engineering & Tech
Sheriguda(Vill), Ibrahimpatnam
R.R. Dist. Telangana-501 510.

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INSTITUTE VISION & MISSION

Vision:

To become a premier institute of academic excellence by providing the world class education that transforms individuals into high intellectuals, by evolving them as empathetic and responsible citizens through continuous improvement.

Mission:

- **IM1:** To offer outcome-based education and enhancement of technical and practical skills.
- **IM2:** To Continuous assess of teaching-learning process through institute-industry collaboration.
- **IM3:** To be a centre of excellence for innovative and emerging fields in technology development with state-of-art facilities to faculty and students' fraternity.
- **IM4:** To Create an enterprising environment to ensure culture, ethics and social responsibility among the stakeholders.

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PROGRAM OUTCOMES

PO1: **ENGINEERING KNOWLEDGE**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2: **PROBLEM ANALYSIS**: Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3: **DESIGN/DEVELOPMENT OF SOLUTIONS**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: CONDUCT INVESTIGATIONS OF COMPLEX PROBLEMS: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: **MODERN TOOL USAGE**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.

PO6: **THE ENGINEER AND SOCIETY**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: **ENVIRONMENT AND SUSTAINABILITY**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8: **ETHICS**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: **INDIVIDUAL AND TEAM WORK**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10: **COMMUNICATION**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, give and receive clear instructions.

PO11: **PROJECT MANAGEMENT AND FINANCE**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, asa member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: LIFE-LONG LEARNING: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change

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SRI INDU INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech.in ARTIFICIAL INTELLIGENCE AND DATA SCIENCE

COURSE STRUCTURE,I YEAR SYLLABUS (BR 22 Regulations)

Applicable from Academic Year:2022-23Batch

IYearI Semester

S. No.	Course Code	CourseTitle	L	T	P	Credits
1.	MA101BS	MatricesandCalculus	3	1	0	4
2.	AP102BS	AppliedPhysics	3	1	0	4
3.	CS103ES	ProgrammingforProblemSolving	3	0	0	3
4.	ME102ES	EngineeringWorkshop	0	1	3	2.5
5.	EN104HS	EnglishforSkillEnhancement	2	0	0	2
6.	CS106ES	ElementsofComputerScience&Engineering	0	0	2	1
7.	AP105BS	AppliedPhysicsLaboratory	0	0	3	1.5
8.	CS107ES	ProgrammingforProblemSolvingLaboratory	0	0	2	1
9.	EN107HS	English Language and Communication Skills Laboratory	0	0	2	1
10.	*MC101ES	EnvironmentalScience	3	0	0	0
11.		InductionProgramme				
		Total	**14**	**3**	**12**	**20**

IYearII Semester

S. No.	Course Code	CourseTitle	L	T	P	Credits
1.	MA201BS	OrdinaryDifferentialEquationsandVector Calculus	3	1	0	4
2.	CH203BS	EngineeringChemistry	3	1	0	4
3.	ME201ES	ComputerAidedEngineeringGraphics	1	0	4	3
4.	EE201ES	BasicElectricalEngineering	2	0	0	2
5.	EC201ES	ElectronicDevicesandCircuits	2	0	0	2
6.	CH206BS	EngineeringChemistryLaboratory	0	0	2	1
7.	EE202ES	BasicElectricalEngineeringLaboratory	0	0	2	1
8.	CS201ES	PythonProgrammingLaboratory	0	1	2	2
9.	CS203ES	ITWorkshop	0	0	2	1
		Total	**11**	**3**	**12**	**20**

ENGINEERING CHEMISTRY
(Course Code: CH203BS)

B.Tech. I Year II Sem.

L	T	P	C
3	1	0	4

Course Objectives:

1. To bring adaptability to new developments in Engineering Chemistry and to acquire the skills required to become a perfect engineer.
2. To include the importance of water in industrial usage, fundamental aspects of battery chemistry, significance of corrosion it's control to protect the structures.
3. To imbibe the basic concepts of petroleum and its products.
4. To acquire required knowledge about engineering materials like cement, smart materials and Lubricants.

Course Outcomes:

1. Students will acquire the basic knowledge of electrochemical procedures related to corrosion and its control.
2. The students are able to understand the basic properties of water and its usage in domestic and industrial purposes.
3. They can learn the fundamentals and general properties of polymers and other engineering materials.
4. They can predict potential applications of chemistry and practical utility in order to become good engineers and entrepreneurs.

UNIT - I: Water and its treatment: [8]

Introduction to hardness of water – Estimation of hardness of water by complexometric method and related numerical problems. Potable water and its specifications - Steps involved in the treatment of potable water - Disinfection of potable water by chlorination and break - point chlorination. Defluoridation - Determination of F^- ion by ion- selective electrode method.

Boiler troubles: Sludges, Scales and Caustic embrittlement. Internal treatment of Boiler feed water - Calgon conditioning - Phosphate conditioning - Colloidal conditioning, External treatment methods - Softening of water by ion- exchange processes. Desalination of water – Reverse osmosis.

UNIT – II Battery Chemistry & Corrosion [8]

Introduction - Classification of batteries- primary, secondary and reserve batteries with examples. Basic requirements for commercial batteries. Construction, working and applications of: Zn-air and Lithium ion battery, Applications of Li-ion battery to electrical vehicles. Fuel Cells- Differences between battery and a fuel cell, Construction and applications of Methanol Oxygen fuel cell and Solid oxide fuel cell. Solar cells - Introduction and applications of Solar cells.

Corrosion: Causes and effects of corrosion – theories of chemical and electrochemical corrosion – mechanism of electrochemical corrosion, Types of corrosion: Galvanic, water-line and pitting corrosion. Factors affecting rate of corrosion, Corrosion control methods- Cathodic protection – Sacrificial anode and impressed current methods

UNIT - III: Polymeric materials: [8]

Definition – Classification of polymers with examples – Types of polymerization – addition (free radical addition) and condensation polymerization with examples – Nylon 6:6, Terylene

Plastics: Definition and characteristics- thermoplastic and thermosetting plastics, Preparation, Properties and engineering applications of PVC and Bakelite, Teflon, Fiber reinforced plastics (FRP).

Rubbers: Natural rubber and its vulcanization.

Elastomers: Characteristics –preparation – properties and applications of Buna-S, Butyl and Thiokol rubber.

Conducting polymers: Characteristics and Classification with examples-mechanism of conduction in trans-polyacetylene and applications of conducting polymers.

Biodegradable polymers: Concept and advantages - Polylactic acid and poly vinyl alcohol and their Applications.

UNIT - IV: Energy Sources: [8]

Introduction, Calorific value of fuel – HCV, LCV- Dulongs formula. Classification- solid fuels: coal – analysis of coal – proximate and ultimate analysis and their significance. Liquid fuels – petroleum and its refining, cracking types – moving bed catalytic cracking. Knocking – octane and cetane rating, synthetic petrol - Fischer-Tropsch's process; Gaseous fuels – composition and uses of natural gas, LPG and CNG, Biodiesel – Transesterification, advantages.

UNIT - V: Engineering Materials: [8]

Cement: Portland cement, its composition, setting and hardening.

Smart materials and their engineering applications

Shape memory materials- Poly L- Lactic acid. Thermoresponse materials- Polyacryl amides, Poly vinyl amides

Lubricants: Classification of lubricants with examples-characteristics of a good lubricants - mechanism of lubrication (thick film, thin film and extreme pressure)- properties of lubricants: viscosity, cloud point, pour point, flash point and fire point

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TEXT BOOKS:

1. Engineering Chemistry by P.C. Jain and M. Jain, Dhanpatrai Publishing Company, 2010
2. Engineering Chemistry by Rama Devi, Venkata Ramana Reddy and Rath, Cengage learning, 2016
3. A text book of Engineering Chemistry by M. Thirumala Chary, E. Laxminarayana and K. Shashikala, Pearson Publications, 2021.
4. Textbook of Engineering Chemistry by Jaya Shree Anireddy, Wiley Publications

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REFERENCE BOOKS:

1. Engineering Chemistry by Shikha Agarwal, Cambridge University Press, Delhi (2015
2. Engineering Chemistry by Shashi Chawla, Dhanpatrai and Company (P) Ltd. Delhi (2011)

Course: Engineering Chemistry(C122) **Class: I-B. TECH A I & D S**

Course Outcomes

After completing this course the student will be able to:

C122.1: Student can explain the basic properties of water& usage in domestic, industrial purpose, preventive measures to water related problems and water purification methods (**Understanding)L2**

C122.2: Student can acquire the knowledge of construction of electrochemical cells used in various batteries, fuel cells and their applications **(Knowledge)L1**

C122.3: Student can able to understand the mechanism, control measures of the types of corrosion and their applications **(Applying)L3**

C122.4: Student can learn the fundamentals & general properties of types of polymers, preparation & applications in various fields (**Applying)L3**

C122.5: Student can learn the basic knowledge on analysis of fuels and composition of the gaseous fuels (**Analysing)L4**

C122.6: Student can acquire the knowledge on engineering materials like cement, smart materials lubricants and their applications in constructions & health benefits **(Understanding)L2**

CO's Mapping with PO/PSO

Mapping of course outcomes with program outcomes:

High -3 Medium -2 Low-1

PO/CO	PO1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO 11	PO 12	PS O1	PS O2
C122.1	2	2	-	-	-	1	1	-	-	-	-	2	-	-
C122.2	2	2	-	-	1	1	1	-	-	-	-	1	-	-
C122.3	2	2	-	-	-	-	1	-	-	-	-	-	-	-
C122.4	2	-	-	-	_	1	1	-	-	-	-	1	-	-
C122.5	2	2	-	-	_	-	1	-	-	-	-	-	-	-
C122.6	2	1	-	-	1	1	1	-	-	-	-	1	-	-
C122	**2.00**	**1.8**	-	-	**1**	**1**	**1**	-	-	-	-	**1**	-	-

CO-PO mapping Justification

PO1. ENGINEERING KNOWLEDGE: Apply the knowledge of mathematics, science,engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2.PROBLEM ANALYSIS: Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO5. **MODERN TOOL USAGE**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.

PO6: **THE ENGINEER AND SOCIETY**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: ENVIRONMENT AND SUSTAINABILITY: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO12. **LIFE-LONG LEARNING**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

C122.1: Student can explain the basic properties of water& usage in domestic, industrial purpose, preventive measures to water related problems and water purification methods (understanding)L2

	Justification
PO1	Student get the knowledge on the water treatment methods (level 2)
PO2	Classify the types of hardness of water (level 2)
PO6	Student can able to know the importance of purification methods(level1)
PO7	Student can understand the impact of water treatment methods in industrial and domestic usage (level1)
PO12	Student can attain the knowledge in life –long practice (level 2)

C122.2: Student can acquire the knowledge of construction of electrochemical cells used in various batteries, fuel cells and their applications (Knowledge)L1

	Justification
PO1	Student can get the knowledge on construction of electrochemical cell(level2)
PO2	Student can able to understand the usage of batteries (level 2)
PO5	Student can able to understand the types of battery cells & fuel cells(level1)
PO6	Student can able to get the knowledge on applications of fuel cells(level1)
PO7	Student can understand the usage of eco-friendly fuels (level1)
PO12	Student can attain the knowledge in life –long practice (level 1)

C122.3: Student can able to understand the mechanism, control measures of the types of corrosion and their applications (Applying)L3

	Justification
PO1	Student get the knowledge of corrosion (level 2)
PO2	Student can understand the different types of corrosion(level2)
PO7	Student can understand the corrosion control methods (level 1)

C122.4: Student can learn the fundamentals & general properties of types of polymers, preparation& applications in various fields (Applying)L3

	Justification
PO1	Student can understand the fundamentals of the polymers(level2)
PO6	Student can able to know the wide range of applications of the polymers(level1)
PO7	Student can utilize the concept of bio-degradable polymers(level1)
PO12	Student can attain the knowledge in life –long practice (level 1)

C122.5: Student can learn the basic knowledge on analysis of fuels and composition of the gaseous fuels (Analysing)L4

	Justification
PO1	Student can classify the different types of fuels(level2)
PO2	Student can understand the extraction of the fuels (level2)
PO7	Student can able to get knowledge about composition of eco-friendly fuels(level1)

C122.6: Student can acquire the knowledge on engineering materials like cement, smart materials, lubricants and their applications in constructions & health benefits (Understanding)L2

	Justification
PO1	Student can get the knowledge on the composition of engineering materials(level2)
PO2	Student can able to get the composition and applications of engineering materials(level1)
PO5	Student can understand the usage in the medical applications(level1)
PO6	Student can contribute the application for further applications(level1)
PO7	Student can understand the promotion for the sustainable environment (level1)
PO12	Student can attain the knowledge in life –long practice (level 1)

SRI INDU INSTITUTE OF ENGINEERING AND TECHNOLOGY

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(Approved by AICTE, New Delhi and Affiliated to JNTUH, Hyderabad)
Khalsa Ibrahimpatnam, Sheriguda(V), Ibrahimpatnam(M), Ranga Reddy Dist., Telangana – 501 510
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Lr. No. SIIET/BR22/Academic Calendar/2022/02 Date: 15.12.2022

REVISED ACADEMIC CALENDAR
I B.TECH FOR THE ACADEMIC YEAR 2022-23
(BR22-REGULATIONS)

Dr. I. Satyanarayana,
Principal.

X3

To,
All the HOD's
Sir,

Sub: SIIET (Autonomous)–Academic & Evaluation–Revised Academic Calendar for **I B.Tech - I & II Semesters** for the academic year 2022-2023-Reg.

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The approved Academic Calendar for **I B.Tech – I & II Semesters** for the academic year 2022-23 is given below.

I-SEMESTER

S. NO	Description	Period		Duration
		From	To	
1.	Commencement of I Semester class work (including Induction programme)	03.11.2022		
2.	1st Spell of Instructions	03.11.2022	28.12.2022	8 Weeks
3.	I Mid Examinations	`29.12.2022	04.01.2023	1 Week
4.	Submission of First Mid Term Exam Marks to the Autonomous Section on or before	10.01.2023		
5.	2nd Spell of Instructions	05.01.2023	02.03.2023	8 Weeks
6.	Second Mid Term Examinations	03.03.2023	09.03.2023	1 Week
7.	Preparation & Practical Examinations	10.03.2023	16.03.2023	1 Week
8.	Submission of Second Mid Term Exam Marks to the Autonomous Section on or before	16.03.2023		
9.	I Semester End Examinations	17.03.2023	01.04.2023	2 Weeks

II-SEMESTER

S. NO	Description	Period		Duration
		From	To	
1.	Commencement of II Semester class work	03.04.2023		
2.	1st Spell of Instructions (including Summer Vacation)	03.04.2023	10.06.2023	10 Weeks
	Summer Vacation	15.05.2023	27.05.2023	2 Weeks
3.	I Mid Examinations	`12.06.2023	17.06.2023	1 Week
4.	Submission of First Mid Term Exam Marks to the Autonomous Section on or before	23.06.2023		
5.	2nd Spell of Instructions	19.06.2023	12.08.2023	8 Weeks
6.	II Mid Term Examinations	14.08.2023	19.08.2023	1 Week
7.	Preparation & Practical Examinations	21.08.2023	26.08.2023	1 Week
8.	Submission of Second Mid Term Exam Marks to the Autonomous Section on or before	26.08.2023		
9.	II Semester End Examinations	28.08.2023	09.09.2023	2 Weeks
Commencement of Class Work for II B.Tech I Semester – 11.09.2023				

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Copy to All the Heads of the Depts. & AO:

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Class: AI &DS **Semester: II** **W.E.F-03-04-2023** **LH:-D-210**

	I 9:40-10:30	II 10:30 - 11:20	III 11:20-12:10	12:10-12.45	IV 12.45-1.35	V 1.35-2.25	VI 2.25-3.15	VII 3.15-4.00
MON	CAEG PRACTICE			LUNCH	EC	BEE	EDC	LIBRARY
TUE	EC/BEE LAB				ODE	EC	BEE	BEE(T)/EDC(T)
WED	ITWS LAB				ODE	EDC	BEE	PYTHON(T)
THU	ODE	EC	EDC		EC/BEE LAB			ODE(T)/EC(T)
FRI	BEE	ODE	ODE		CAEG PRACTICE			EDC(T)/ BEE(T)
SAT	EDC	EC	BEE		PYTHON LAB			EC(T)/ODE(T)

Course Code	Course Name	Name of the Faculty	Course Code	Course Name	Name of the Faculty
MA201BS	ODE-Ordinary Differential Equations & Vector Calculus	V.SUJATHA	**CH206BS**	EC LAB-Engineering Chemistry Laboratory	K.MOUNIKA/V.MOUNIKA
CH203BS	EC-Engineering Chemistry	K.MOUNIKA	**EE202ES**	BEE LAB-Basic Electrical Engineering Laboratory	G.BHARGAVI/K.RAJASHEKAR
ME201ES	CAEG-Computer Aided Engineering Graphics	A.MALLESH	**CS201ES**	PYTHON Programming Laboratory	M.TEJASWI/ P.BALU
EE201ES	BEE-Basic Electrical Engineering	G.BHARGAVI	**CS203ES**	ITWS-IT Workshop	N.KEERTHI CHANDANA/B.SWATHI
EC201ES	EDC-Electronic Devices & Circuits	P.SRILATHA			

Class In-Charge **Time Tabled Coordinator** **Head of The Department**

Sri Indu Institute of Engg. & Tech
Main Road, Sheriguda(V),
Ibrahimpatnam(M), R.R. Dist.

Engineering Chemistry : Lesson Plan

L/H	TOPIC TO BE COVERED	TEACHING AIDS	BOOKS
	UNIT-1: WATER & ITS TREATMENT		
1	Introduction to hardness of water, types of hardness.	Black Board	T1,R1
2	Units of hardness, Estimation of hardness of water by complexometric method.	Black Board	T1,R1
3	Related numerical problems.	Black Board	T1,R1
4	Potable water and its specifications - Steps involved in the treatment of potable water	Black Board, PPT	T1,R1
5	Disinfection of potable water by chlorination and break - Point chlorination.	Black Board	T1,R1
6	Defluoridation- Determination of F- ion by ion- selective electrode method .Boiler troubles: Sludges, Scales	Black Board	T1,R1,W1
7	Caustic embrittlement. Internal treatment of Boiler feed water -Calgon conditioning - Phosphate conditioning - Colloidal conditioning.	Black Board, PPT	T1,R1
8	External treatment methods -Softening of water by ion- exchange process.	Black Board, PPT	T1,R1, V1
9	Desalination of water – Reverse osmosis.	Black Board	T1,R1
	UNIT–I1: BATTERY CHEMISTRY AND CORROSION		
10	Introduction - Classification of batteries- primary, secondary and reserve batteries with examples.	Black Board	T1,R1
11	Basic requirements for commercial batteries. Construction, working and applications of: Zn-air battery.	Black Board	T1,R1

12	Lithium-ion battery, Applications of Li-ion battery to electrical vehicles.	Black Board	T1,R1
13	Fuel Cells- Differences between battery and a fuel cell, Construction and applications of Methanol Oxygen fuel cell.	Black Board	T1,R1,W2
14	Solid oxide fuel cell. Solar cells - Introduction and applications of Solar cells.	Black Board	T1,R1
15	**Corrosion:** Causes and effects of corrosion.	Black Board, PPT	T1,R1
16	Theories of chemical Corrosion and mechanism of chemical corrosion.	Black Board, PPT	T1,R1 V2
17	Electrochemical corrosion –mechanism of electrochemical corrosion.	Black Board PPT	T1,R1,
18	Types of corrosion: Galvanic, water-line and pitting corrosion	Black Board	T1,R1
19	Factors affecting rate of corrosion	Black Board	T1,R1
20	Corrosion control methods.	Black Board	T1,R1
21	Cathodic protection-sacrificial and impressed current methods	Black Board	T1,R1
UNIT–III POLYMERIC MATERIALS			
22	Definition – Classification of polymers with examples.	Black Board	T1,R1
23	Types of polymerization –addition (free radical addition) .	Black Board	T1,R1
24	Condensation polymerization with examples – Nylon 6:6, Terylene	Black Board	T1,R1
25	Definition and characteristics thermoplastic and thermosetting plastics.	Black Board	T1,R1
26	Bakelite, Teflon, Fiber reinforced plastics (FRP).	Black Board	T1,R1
27	Natural rubber and its vulcanization.	Black Board	T1,R1
28	Elastomers, Characteristics –preparation – properties and applications of Buna-S rubber.	Black Board	T1,R1

29	Butyl rubber, and Thiokol rubber.	Black Board	T1,R1
30	Characteristics and Classification of conducting polymers with examples.	Black Board	T1,R1 W3,V3
31	Mechanism of conduction intrans-poly acetylene and applications of conducting polymers.	Black Board	T1, R1
32	Biodegradable polymers, Concept and advantages – Polylacticacid and poly vinyl alcohol and their applications.	Black Board	T1, R1
UNIT-IV ENERGY SOURCES			
33	Introduction, calorific value of fuel-HCV,LCV.Units of calorific value	Black Board	T1, R1
34	Dulongs formula. Classification- solid fuels.	Black Board	T1,R1
35	Coal –analysis of coal – proximate analysis and their significance.	Black Board	T1,R1,W4
36	Ultimate analysis of coal and their significance.	Black Board, PPT	T1,R1
37	Liquid fuels – petroleum and its refining.	Black Board, PPT	T1,R1
38	Cracking types – moving bed catalytic cracking.	Black Board ,PPT	T1,R,V4
39	Knocking – octane and cetane rating.	Black Board	T1,R1
40	Synthetic petrol - Fischer-Tropsch's process.	Black Board	T1,R1
41	Gaseous fuels – composition and uses of natural gas, LPG.	Black Board	T1, R1
42	CNG, Biodiesel – Transesterification, advantages.	Black Board	T1, R1
UNIT –V: ENGINEERING MATERIALS			
43	Introduction of Portland cement &its composition,	Black Board	T1,R1
44	Setting and hardening of Portland cement.	Black Board	T1, R1
45	Smart materials and their engineering applications.	Black Board	T1, R1,W5

46	Shape memory materials- Poly L- Lactic acid.	Black Board	T1, R1, V5
47	Thermoresponse materials- Polyacryl amides, Polyvinyl amides	Black Board	T1, R1
48	Introduction of lubricants. Classification of lubricants with examples.	Black Board	T1, R1
49	Characteristics of a good lubricants, mechanism of lubrication -thick film, thin film and extreme pressure	Black Board	T1, R1
50	Properties of lubricants: viscosity, cloud point, pour point, flash point and fire point	Black Board	T1, R1

Text books:

1. Engineering Chemistry by P.C. Jain and M. Jain, Dhanpatrai Publishing Company, 2010

2.Engineering Chemistry by Rama Devi, Venkata Ramana Reddy and Rath, Cengage learning, 2016.

3. A text book of Engineering Chemistry by M. Thirumala Chary, E. Laxminarayana and K. Shashikala, Pearson Publications, 2021.

4.Textbook of Engineering Chemistry by Jaya Shree Anireddy, Wiley Publications.

Reference books:

1. Engineering Chemistry by Shikha Agarwal, Cambridge University Press, Delhi (2015).
2. Engineering Chemistry by Shashi Chawla, Dhanpatrai and Company (P) Ltd. Delhi (2011).

GAP WITHIN THE SYLLABUS – MAPPING TO CO, PO

Galvanic cell construction and functioning and preparation of cement

Course outcome;

After completing this topic, the student will be able to:

1. The required principles and concepts of electrochemistry, to know the different types of batteries and applications (Analysis) L3

2. The basic principle involved in the preparation of cement. (Knowledge) L1

Mapping of course outcomes with program outcomes:

High -3 Medium -2 Low-1

PO/ CO	PO1	PO2	PO 3	PO4	PO5	PO6	PO7	PO8	PO 9	PO 10	PO 11	PO 12	PS O1	PS O2
1	2	2	-	-	1	-	-	-	-	-	-	1	-	-
2	2	-	-	-	1	-	-	-	-	-	-	1	-	-

GAP BEYOND THE SYLLABUS-MAPPING TO PO/PSO

Chemical analysis of water, corrosion control methods and utilization of smart materials in medical field.

Course outcome:

After completing this topic, the student will be able to:

1. The basic principle involved in the concept of chemical analysis of brackish water.

2. The process involved in the application of the corrosion control methods involving electrochemical process.

3. The mechanism involved in the application of smart materials in the medical field

Mapping to PO/PSO:

High -3 Medium -2 Low-1

PO/ CO	PO1	PO2	PO3	PO4	PO5	PO 6	PO7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PS O2
1	2	2	-	-	-	-	-	-	-	-	-	1	-	-
2	2	2	-	-	-	-	-	-	-	-	-	1	-	-
3	2	2	-	-	-	-	-	-	-	-	-	1	-	-

WEB REFERENCES :

W-1 https://www.thermodyneboilers.com/boiler-problems/

W-2 https://chem.libretexts.org/Bookshelves/General_Chemistry/Chemistry_1e_(OpenSTAX)/17%3A_Electrochemistry/17.5%3A_Batteries_and_Fuel_Cells

W3 https://www.sciencedoze.com/2022/03/conducting-polymers-definition- examples.html

W4 https://www.scribd.com/presentation/497847401/Analysis-of-Coal

W5 https://www.atriainnovation.com/en/what-are-shape-memory-materials/

VIDEO REFERENCES :

1. https://youtu.be/ctlHNf1s6RM?si=FnrLSa3uXqzPZtDR –Ion exchange process
2. https://www.youtube.com/live/rPv35HuWLW0?si=8pIqwhWd8IWyHOZZ – Corrosion
3. https://youtu.be/1dG0PmKFsQA?si=u83MUinL3KQs4mKd –Conducting polymers
4. https://youtu.be/SayZyTMROxk?si=CCB22VarlU6SIygw –moving bed catalytic cracking
5. https://youtu.be/I7doX1zWGdw?si=NhhkbRfuJ24j0QvM –shape memory materials

POWERPOINT PRESENTATION

Unit-1

https://docs.google.com/presentation/d/1Hcj1ip8ap6k_h1568J-W3r0h2Aax1hOP/edit?usp=sharing&ouid=105720808056246778205&rtpof=true&sd=true

Unit-2

https://docs.google.com/presentation/d/1Zihc9ppImK9VfChsvuvuadcse4UT_J1K/edit?usp=sharing&ouid=105720808056246778205&rtpof=true&sd=true

Unit-4

https://docs.google.com/presentation/d/1wiZafPiRaH4xGjQffBYyrtEZcWACgbaa/edit?usp=sharing&ouid=105720808056246778205&rtpof=true&sd=true

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Khalsa Ibrahimpatnam, Sheriguda(V), Ibrahimpatnam(M), Ranga Reddy Dist., Telangana-501510

Lecture notes

Unit 1 link:

https://drive.google.com/file/d/1aOrg6Z_XXPGsKHuH_JuK7axChExklgQt/view?usp=sharing

Unit 2 link:

https://drive.google.com/file/d/1TMLCoVT2RWRtsH2bM0BVIvJczijYOfDN/view?usp=sharing

Unit 3 link:

https://drive.google.com/file/d/1QtQUV-imszqWSetKXo-Ym4-n-GDtQBuw/view?usp=sharing

Unit 4 link:

https://drive.google.com/file/d/1qFliGL1PBVX17zxegygc2BbHa7cO3RFD/vi ew?usp=sharing

Unit 5 link:

https://drive.google.com/file/d/1rup7vbaItLmbGa1UX66L36T4DECWlOle/view?usp=sharing

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PREVIOUS QUESTION PAPERS

https://drive.google.com/file/d/17ykw7LHO8laz-veKgY4xPixSCPcqOSd/view?usp=sharing

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Khalsa Ibrahimpatnam, Sheriguda(V), Ibrahimpatnam(M), Ranga Reddy Dist., Telangana – 501 510

BR22

I B.TECH II SEM I-MID Examinations,June-2023

Set-I

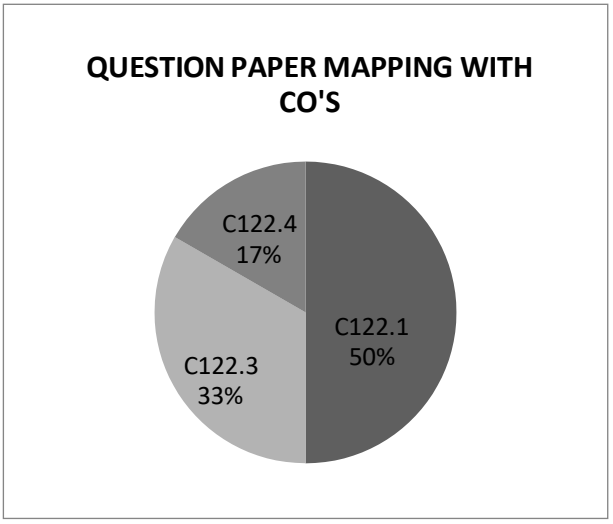
Branch: CIVIL, ECE, CSE (AI&ML), CSE (IOT), AI&DS — Date: 13-06-2023(FN)

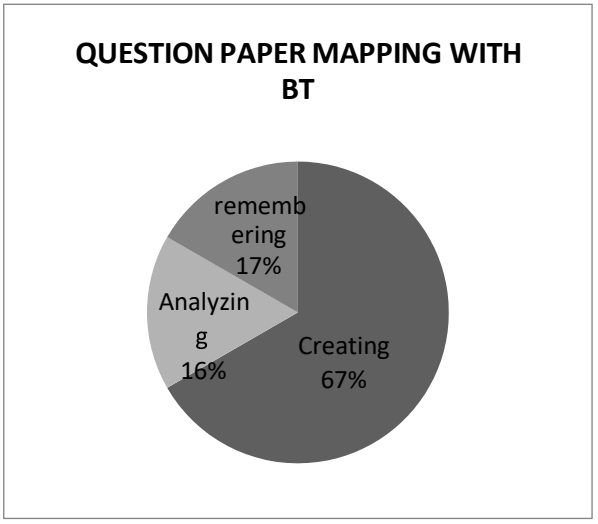
Subject: Engineering chemistry — Marks: 20 — Time: 2 Hours

PART-B

Answer any **FOUR** Questions. All Question carry Equal Marks — 4*5=20 Marks

1. Discuss demineralization of hard water using ion exchange process with a net diagram? [Creating L6](C122.1)
2. Discuss different methods used for internal treatment of boiler feed water? [Creating L6](C122.1)
3. Distinguish between scales and sludges? [AnalyzingL4](C122.1)
4. Write a note on corrosion? [RememberingL1](C122.3)
5. Discuss sacrificial anode and impressed current cathodic protection methods? [Creating L6](C122.3)
6. Discuss the mechanism of addition polymerization? [Creating L6](C122.4)





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Khalsa Ibrahimpatnam, Sheriguda(V), Ibrahimpatnam(M), Ranga Reddy Dist., Telangana – 501 510

Branch: CIVIL, ECE, CSE (AI&ML),CSE(IOT),AI&DS
Subject: Engineering chemistry

Date:13-06-2023(FN)
Marks: 10

Student name:…… H.T.NO:

PART-A

Objective/Quiz paper

The objective /quiz paper is set with multiple choice, fill in the blanks and match the following type of question for a total of 10 marks.

Multiple choices:

1. Temporary hardness of water can be removed by [ ]
   A) Chlorination B) Boiling C) Aeration D) None
2. The salt used in calgon conditioning is [ ]
   A) Sodium Hexa Meta phosphate B) Sodium Tri phosphate
   C) Sodium Dihydrogen phosphate D) Sodium Hydrogen phosphate [ ]
3. Chemical formula of Rust [ ]
   A) FeO B) Fe_3O_3 C) Fe_3O_4 D) $Fe_2O_3x\ H_2O$ [ ]
4. PVC is a polymer of repeating units of [ ]
   A) Ethylene B) Tetrachloroethylene
   C) Acrylonitrile D) Vinyl chloride

Fill in the blanks:

5. Hardness of water can be expressed in terms of equivalents of _____
6. A fuel cell converts chemical energy in to _____
7. _____is used as electrolyte in methanol oxygen fuel cell
8. Homo polymers are made of _____

Match the following:

9.

i. Boiler	[ ]	A. Electro chemical fuel
ii. Reverse osmosis	[ ]	B. Caustic embrittlement
iii .Zn-Air Battery	[ ]	C. Cellulose acetate
iv. Wet corrosion	[ ]	D. Primary Battery

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I B.TECH II SEM I-MID Examinations, June-2023 **BR22**

Answer key

Descriptive paper key link

https://drive.google.com/file/d/1H5BLaJ22sLxzBsFtrBHcqnVB4QC4Hu-n/view?usp=sharing

Objective/Quiz Key Paper

Multiple choices:

1. B
2. A
3. D
4. D

Fill in the blanks:

5. $CaCO_3$
6. Electrical energy
7. Methanol
8. Same monomers

Match the following:

9.I-B

II-C

III-D

IV-A

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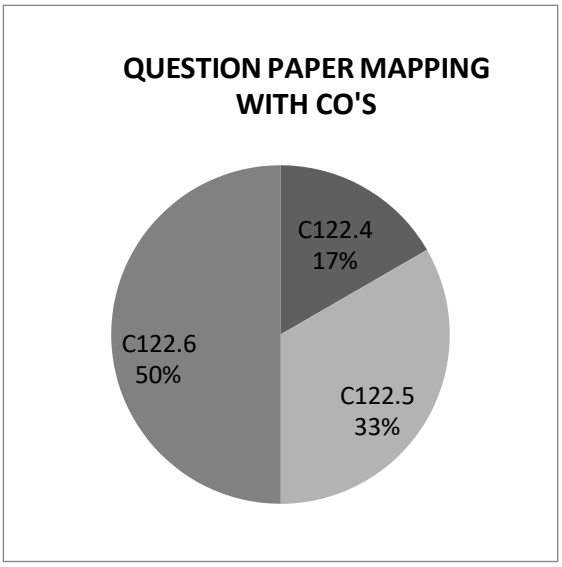
I B.TECH II SEM I1-MID Examinations, August-2023 **BR22**

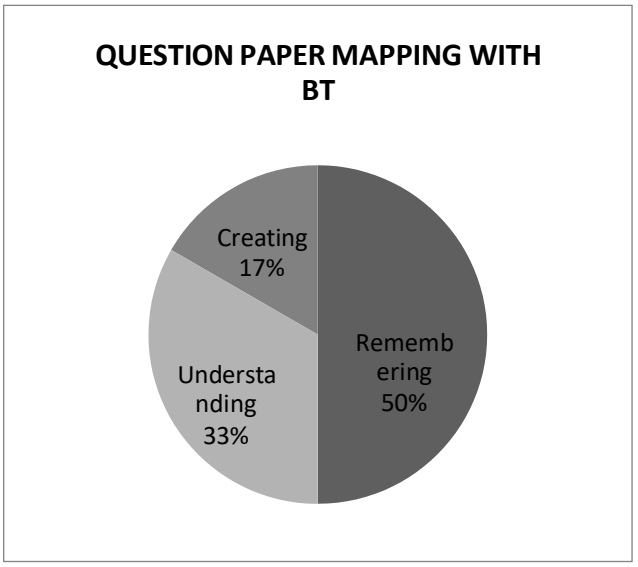
Branch: CIVIL, ECE, CSE (AI&ML), CSE (IOT), AI&DS Date: 16-08-2023(FN)
Subject: Engineering chemistry Marks: 20 Time: 2 Hours

PART-B

Answer Any FOUR Question Carry Equal Marks 4*5=20 Marks

1. Define biodegradable polymers taking poly lactic acid as an example?
(Remembering L1)(C122.4)
2. Explain ultimate analysis of coal? (Understanding L2)(C122.5)
3. Define cracking, knocking of petrol, octane number, cetane number?
(Remembering L1) (C122.5)
4. Give the composition of Portland cement? (Remembering L1) (C122.6)
5. Explain the mechanism of lubrication? (Understanding L2) (C122.6)
6. Discuss the properties of lubricants? (Creating L6) (C122.6)





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I B.TECH II SEM II-MID Examinations, August-2023

Branch: CIVIL, ECE, CSE (AI&ML), CSE (IOT), AI&DS | Date: 16-08-2023 | **BR22**

Subject: Engineering chemistry | Marks: 10

Student name:…… H.T.NO: | | | | | | | | | | |

PART-A

Objective/Quiz paper

The objective /quiz paper is set with multiple choice, fill in the blanks and match the following type of question for a total of 10 marks.

Multiple choices:

1. Buna-s is prepared by the following polymerization [ ]

a) Copolymerization b) Condensation c) Both a & b d) None

2. Natural gas mainly contains [ ]

a) CH4 b) n-butane c) n-octane d) acetylene

3. Gross calorific value is also known as [ ]

a) Highest calorific value b) Low calorific value c) Net calorific value d) None

4. Cement contains [ ]

a) Calcareous material b) Argillaceous material c) Both a & b d) None

Fill in the blanks:

5. Polymers which can be degraded by microorganisms are known as_____

6. Petroleum refining is carried out using_____distillation.

7._is an example of semi solid lubricants.

8. Good lubricant viscosity should be_____

Match the following:

9. i. Ultimate analysis [ ] a) Retards initial setting of cement.

ii.Gypsum [ ] b) cement

iii. Inorganic building material [ ] c) Fractional distillation.

iv. Petroleum refining [ ] d) Quantitative

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I B.TECH II SEM II -MID Examinations, August-2023 **BR22**

Answer key

Descriptive paper key link

https://drive.google.com/file/d/1k0XrBzV2B3nlOw8OODI7wTMtY4uc8grj/view?usp=sharing

Objective/Quiz Key Paper

Multiple choices:

1. C
2. A
3. A
4. C

Fill in the blanks:

5. Bio degradable polymers
6. Fractional distillation
7. Grease
8. High

Match the following:

9.

I-D

II-A

III-B

IV-C

MID-1 & MID-11 STUDENT ANSWER SCRIPTS:

https://drive.google.com/file/d/1FNUkd5Joaq20rbSQ9txvjV_1qz_Q8qpN/view?usp=sharing
-MID-I

https://drive.google.com/file/d/1JP4OHUeoHzUZTjICAvHiCEYwxfzYTkQJ/view?usp=sharing
-MID-II

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I-MID ENGINEERING CHEMISTRY ASSIGNMENT

1. Define hardness?Types of hardness ? Expression of hardness?Write about the units of hardness.

(Remembering L1) (C122.1)

2. Explain about the treatment of boiler feed water? **(Understanding L2) (C122.1**)

3. Explain about boiler troubles? **(Understanding L2) (C122.1)**

4. What are the steps involved in the tratment of portable water ? (**Remembering L1) (C122.1)**

5. What are the difference between primary and secondary batteries with examples?(**Remembering L1) (C122.2)**

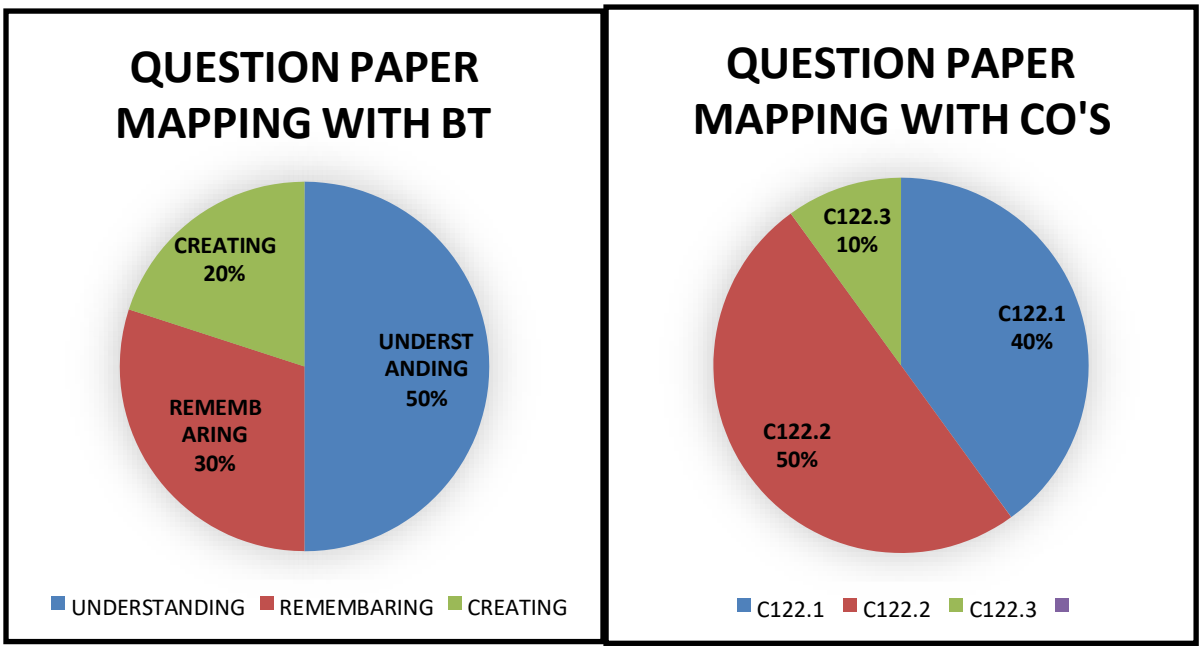
6. Explain about the construction and applications of methanol oxygen fuell cell and solid oxide fuel cell? **(Understanding L2) (C122.2)**

7. Explain about solar cell? **(Understanding L2) (C122.2**)

8. Discuss about factors effecting rate of corrosion ? **(Creating L6) (C122.2**)

9. Discuss about theories of corrosion **(Creating L6) (C122.2)**

10. Explain about types of polymerization? **(Understanding L2) (C122.2)**



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II-MID ENGINEERING CHEMISTRY ASSIGNMENT

1. Define elastomers ? Write about characteristics,preparation,properties & applications of Buna -s, bulyl rubber & Thiokal rubber **(Remembering L1)(C122.3)**

2. Define conducting polymers?Write characteristics & classification of conducting polymers ? **(Remembering L1)(C122.3)**

3. Explain the mechanism of trans poly acetylene and write applications of conducting polymers? **(Understanding L2) (C122.3)**

4. What is mean by Bio-degradable polymers?Explain the concept and advantages and poly vinyl and poly lactic Acids & their applications ? **(Remembering L1) (C122.3)**

5. Define calorific value of fuel ?Explain about HCV, LCV& Dulong's formula?**(Remembering L1) (C122.4**)

6. Explain the classification of fuels ? Explain about solid fuel & their significance? **(Understanding L2)(C122.4)**

7. Explain brief explanation about liquid fuels ? with help a neat diagram. Explain fractional distillation process?(**Understanding L2) (C122.4)**

8. Define types of cracking and explain moving –bed catalytic cracking? **(Remembering L1) (C122.4)**

9. Define knocking& write about octane and cetane rating?**(Remembering L1) (C122.4)**

10. Explain about synthatic petrol & its process ?write about fisher - Tropseh's process ? (**Understanding L2) (C122.4)**

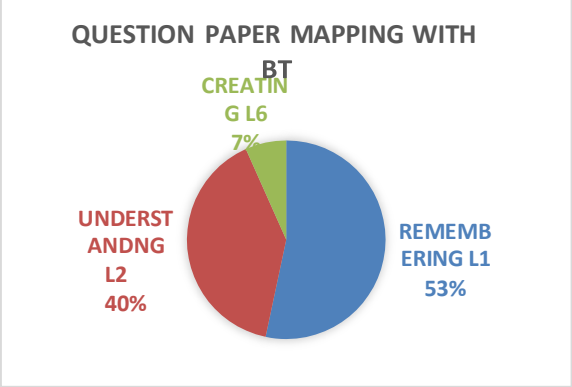
11. Discuss about gaseous fuels?write about composition & uses of natural gas LPG and CNG ?**(Creating L6) (C122.4)**

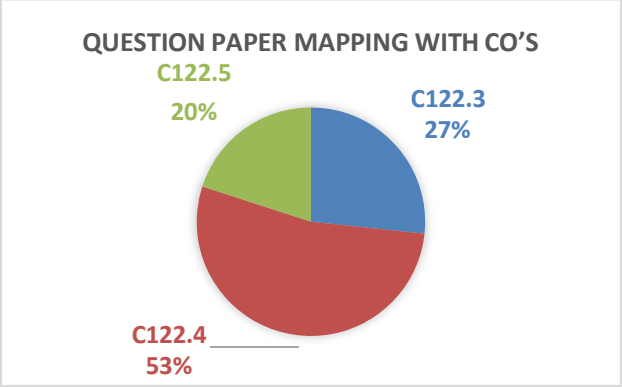
12. What is Biodiesel - Transesterification & it advantages?**(Remembering L1)(C122.4)**

13. Explain about portland cement , its composition & setting & hardening ? **(Understanding L2) (C122.5)**

14. Define lubricants .Explain its characteristics ?**(Remembering L1) (C122.5)**

15. Explain about classification of lubricants with complete explanation? **(Understanding L2) (C122.5)**





I-MID & II-MID ENGINEERING CHEMISTRY ASSIGNMENT PROOFS

https://drive.google.com/file/d/1e9psl9BPhjU9bGq5w3yJPX-z4jbwOEP5/view?usp=sharing
-MID-I

https://drive.google.com/file/d/1tykqcCiXe-VPIut_xo1qxsfrQF2Qhtur/view?usp=sharing
-MID-II

SCHEME OF EVALUATION WITH CO and BTL MAPPING

SCHEME OF EVALUATION-ENGINEERING CHEMISTRY(MID-I)(Set-I)

Instructions:

a) Any answer by alternate method should be valued and suit ably awarded.
b) All answers (including extra ,stuck off and repeated)should be valued .Answers withmaximum marks must be considered.

Qn No	Description of Answer	Marks
1.	Definition of ion-exchange process and differences b/w cation &anion exchanger(C122.1)(Remembering)	2
	Neat diagram of ion –exchang process and equations (C122.1)(Remembering)	2
	Advantages & disadvantages of ion exchange process (C122.1) (Remembering)	1
2.	Mention the names of different internal treatment methods (C122.1)(Remembering)	1
	Complete explanation of different methods &equations(C122.1)(Remembering)	4
3.	Difference b/w scale &sludge has mention the diagram(C122.1)(Analyzing)	1
	What are the causes of scale and sludge and disadvantages(C122.1)(Analyzing)	2
	Mention the preventive methods(C122.1)(Analyzing)	2
4.	Definition of dry corrosion & mention the different types of dry corrosion names (C122.3)(Understanding)	2
	Explain the oxidation corrosion ,corrosion by hydrogen,& liquid metal corrosion with equations and examples(C122.3)(understanding)	3
5	Definitions of sacrificial anode &impressed current cathodic protection methods (C122.3)(understanding)	2
	Neat diagrams and equations of sacrificial anode &impressed current cathodic protection methods (C122.3)(understanding)	3
6	Definition of addition polymerization &mention the steps in the free radical mechanism (C122.4)(Remembering)	2
	Complete explanation of free radical mechanism with equations (C122.4) (Remembering)	3
	TOTAL	**20**

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SCHEME OF EVALUATION WITH CO and BTL MAPPING

SCHEME OF EVALUATION-ENGINEERING CHEMISTRY (MID-II)(Set-II)

Instructions:

a) Any answer by alternate method should be valued and suit ably awarded.
b) All answers (including extra, stuck off and repeated) should be valued .Answers with maximum marks must be considered.

Qn No	Description of Answer	Marks
1	Definition of bio- degradable polymers (C122.4)(Remembering)	1
	Preparation of poly lactic acid with equation &properties& applications (C122.4)(Remembering)	4
2	What are steps involved in ultimate analysis(C122.5)(Understanding)	1
	Explanation of each steps in ultimate analysis(C122.5)(Understanding)	2
	Formula's of each steps in proximate analysis(C122.5)(Understanding)	2
3	Definitions of cracking ,knocking, octane number, cetane number & equations (C122.5)(Remembering)	5
4	Definition of cement and mention the raw materials of cement (C122.6) (Remembering)	2
	Formulas and chemical composition of raw materials of cement (C122.6) (Remembering)	3
5	Mention the names of mechanism of lubrication(C122.6)(Remembering)	1
	Thin film ,thick film & extreme pressure has definition and diagram and where it is used (C122.6)(Remembering)	4
6	Mention the names of properties of lubrication(C122.6)(Understanding)	1
	Explain the each property has definitions and where it is used (C122.6)(Understanding)	4
	TOTAL	**20**

TUTORIAL CLASS

S.NO	TOPIC	Teaching method/Teaching Aid	Session plan	Reference books
1	Hard water, hardness, types of hardness, units of hardness, potable water &its treatment, break point chlorination.	Black Board	1	T1, R1
2	Defluoridation, boiler troubles-sludges, scales, caustic embrittlement, internal treatment method.	Black Board, PPT	1	T1, R1,W1
3	External treatment method ,reverse osmosis	Black Board	1	T1, R1 V1
4	Batteries, types of batteries, construction, working&applications of Zn-air battery.	Black Board	1	T1, R1,W2
5	Lithium –ion battery, fuel cell, methanol –oxygen fuel cell.	Black Board,PPT	1	T1, R1,W2
6	Solid-oxide fuel cell, solar cell, introduction of corrosion.	Black Board	1	T1, R1
7	Theories of corrosion, types of corrosion.	Black Board, PPT	1	T1, R1 V2
8	Corrosion control methods	Black Board	1	T1, R1
9	Polymers, types of polymerization, free radical mechanism.	Black Board	1	T1, R1
10	Preparations of polymers like-Nylon-6,6, Terylene, naturalrubber, vulcanization rubber.	Black Board	1	T1, R1
11	Preparations of polymers like- Buna-s, butyl &Thiokol rubber, PVC.	Black Board	1	T1, R1

12	Classification of conducting polymers, biodegradable polymers.	Black Board	1	T1, R1 W3,V3
13	Calorific value, HCV, LCV, Dulongs formula.	Black Board	1	T1, R1
14	Analysis of coal-proximate &ultimate analysis of coal.	Black Board, PPT	1	T1, R1,W4
15	Petroleum refining –fractional distillation, synthetic petrol-Fischer Tropsch's process	Black Board, PPT	1	T1, R1
16	Cracking-moving bed catalytic cracking, knocking-octane rating &cetane rating.	Black Board, PPT	1	T1, R1 V4
17	Bio diesel- transesterification, CNG, LPG.	Black Board	1	T1, R1
18	Cement-Composition, setting and hardening.	Black Board	1	T1, R1
19	Smart materials – shape memory materials, thermoresponse materials	Black Board	1	T1, R1 W5, V5
20	Classification of lubricants with examples	Black Board	1	T1, R1
21	Properties of lubricants, mechanism of lubricants	Black Board	1	T1, R1

Result Analysis: AI&DS

Course Title	**ENGINEERING CHEMISTRY**
Course Code	**CH203BS**
Programme	B.Tech
Year & Semester	I year II- semester
Regulation	BR22
Course Faculty	K.Mounika, Assistant Professor , H&S

Weak Students:

S No	Roll no	I Semresult	Internal-I Status (35)	Internal-II Status (40)
1	22X31A7240	Failed(4 subject)	17	15
2	22X31A7264	Failed(3 subject)	15	15
3	22X31A7263	Failed(3 subject)	17	16
4	22X31A7230	Failed(3 subject)	18	15
5	22X31A7216	Failed(3 subject)	18	17
6	22X31A7214	Failed(3 subject)	28	28
7	22X31A7254	Failed(2 subject)	20	20
8	22X31A7247	Failed(2 subject)	17	16
9	22X31A7246	Failed(2 subject)	22	16

Advanced learners:

S No	Roll No	I- Sempercentage	Gate Material
1	22X31A7226	89.26 %	Water &its treatment, batteries, fuels & combustion.
2	22X31A7257	88.63 %	
3	22X31A7242	87.16 %	
4	22X31A7259	87.16 %	
5	22X31A7249	86.11 %	
6	22X31A7233	84.53 %	
7	22X31A7260	83.89 %	
8	22X31A7208	83.89 %	

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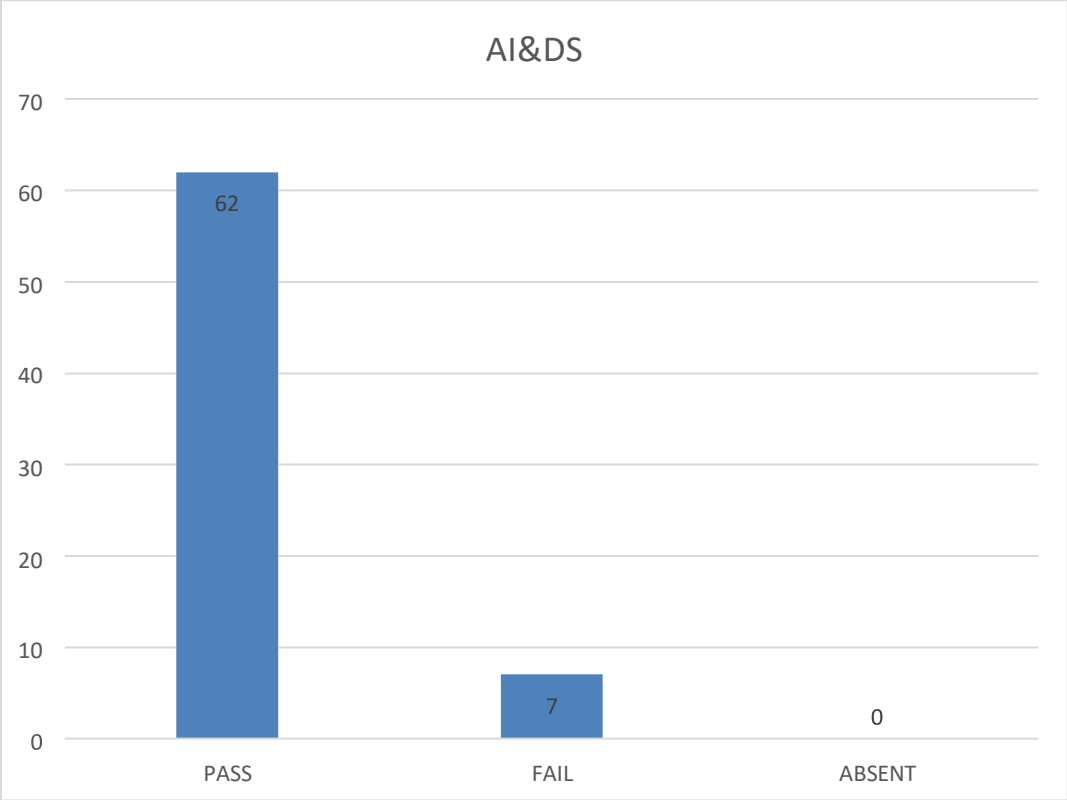
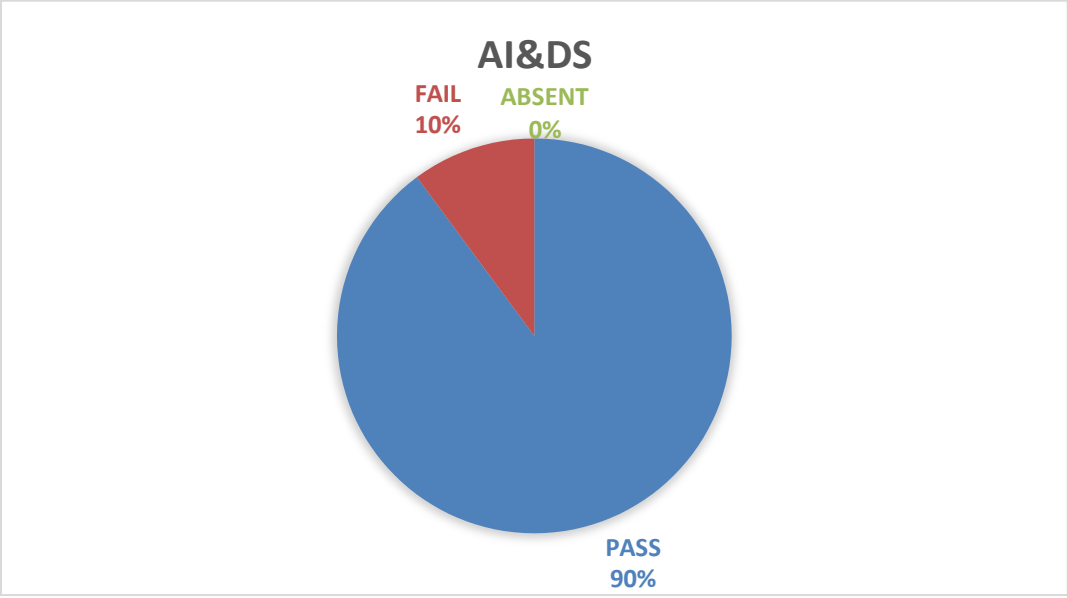
(Approved by AICTE, New Delhi and Affiliated to JNTUH, Hyderabad)
Khalsa Ibrahimpatnam, Sheriguda(V), Ibrahimpatnam(M), Ranga Reddy Dist., Telangana – 501510

RESULT ANALYSIS AT END OF SEMESTER

Branch : AI& DS **Subject: ENGINEERING CHEMISTRY**





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Khalsa Ibrahimpatnam, Sheriguda(V), Ibrahimpatnam(M), Ranga Reddy Dist., Telangana – 501510

DEPARTMENT OF HUMANITIES AND SCIENCE

REMEDIAL CLASSES TIME TABLE

DAY/ PERIOD	MON 4.00-5.00	TUE 4.00-5.00	WED 4.00-5.00	THUR 4.00-5.00	FRI 4.00-5.00	SAT 4.00-5.00
CSE-A	ODE&VC	ENG	EDC	AP	ODE&VC	AP
CSE-B	AP	EDC	ODE&VC	ENG	EDC	ENG
CSE-C	ENG	AP	EDC	ODE&VC	AP	ODE&VC

DAY/ PERIOD	MON 4.00-5.00	TUE 4.00-5.00	WED 4.00-5.00	THUR 4.00-5.00	FRI 4.00-5.00	SAT 4.00-5.00
DS	EDC	AP	ODE&VC	ENG	EDC	ODE&VC
CYBER	ENG	EDC	AP	ODE&VC	AP	ENG

DAY/ PERIOD	MON 4.00-5.00	TUE 4.00-5.00	WED 4.00-5.00	THUR 4.00-5.00	FRI 4.00-5.00	SAT 4.00-5.00
AIML-A	ODE&VC	EC	EDC	BEE	EC	ODE&VC
AIML-B	BEE	EDC	ODE&VC	EC	BEE	EDC

DAY/ PERIOD	MON 4.00-5.00	TUE 4.00-5.00	WED 4.00-5.00	THUR 4.00-5.00	FRI 4.00-5.00	SAT 4.00-5.00
AI&DS	BEE	EC	ODE&VC	EDC	BEE	EC
IOT	EC	ODE&VC	EDC	BEE	ODE&VC	EDC

DAY/ PERIOD	MON 4.00-5.00	TUE 4.00-5.00	WED 4.00-5.00	THUR 4.00-5.00	FRI 4.00-5.00	SAT 4.00-5.00
ECE	ODE&VC	BEE	EC	EDC	BEE	EC
CIVIL	ODE&VC	BEE	EC	AM	BEE	EC

Head of the Department
Department of H&S
SRI INDU INSTITUTE OF ENGG & TECH
Sheriguda(V), Ibrahimpatnam (M), R.R. Dist-501 510

PRINCIPAL
Sri Indu Institute of Engineering & Tech
Sheriguda(Vill), Ibrahimpatnam
R.R. Dist. Telangana-501 510.

SRI INDU INSTITUTE OF ENGINEERING AND TECHNOLOGY

Department of Humanities & Sciences

Course Outcome Attainment (Internal Examination-1)

Name of the facult	K. MOUNIKA	Academic Year:	2022-2023
Branch & Section:	AI&DS	Examination:	I Internal
Course Name:	ENGINEERINGCHEMISTRY	Year: I	Semester: II

S.No	HT No.	Q1a	Q1b	Q1c	Q2a	Q2b	Q2c	Q3a	Q3b	Q3c	Q4a	Q4b	Q4c	Q5a	Q5b	Q5c	Q6a	Q6b	Q6c	Obj1	A1
Max. Marks ==>		**5**			**5**			**5**			**5**			**5**			**5**			**10**	**5**
1	22X31A7201				5			5			5						5			10	**5**
2	22X31A7202				2			3			3						3			8	**5**
3	22X31A7203	5			5												5			9	**5**
4	22X31A7204																				
5	22X31A7205							3			3			3			3			9	**5**
6	22X31A7206	2			3												3			7	**5**
7	22X31A7207	2															3			10	**5**
8	22X31A7208	2			3			3			3									7	**5**
9	22X31A7209							3			3			2			5			7	**5**
10	22X31A7210							3			3						2			8	**5**
11	22X31A7211	4			4			5			5									7	**5**
12	22X31A7212	2			1												5			10	**5**
13	22X31A7213				2			4												10	**5**
14	22X31A7214	2			2			2						1						8	**5**
15	22X31A7215	2						5						4			4			8	**5**
16	22X31A7216	2			3															10	**5**
17	22X31A7217	5			5			4									4			8	**5**
18	22X31A7218				1			3			3						1			8	**5**
19	22X31A7219	5			3									4			4			10	**5**
20	22X31A7220	2						3						3			2			10	**5**
21	22X31A7221				4			4			2						1			8	**5**
22	22X31A7222	5			4			5			4									10	**5**
23	22X31A7223	3			4			2									5			8	**5**
24	22X31A7224	4						2			3						2			10	**5**
25	22X31A7225				4						5			5			3			9	**5**
26	22X31A7226	5						5			5						5			10	**5**
27	22X31A7227	5			5			4									5			10	**5**
28	22X31A7228				1			3			1						3			10	**5**
29	22X31A7229							4			1			4			3			7	**5**
30	22X31A7230	1			1			3			3									10	**5**
31	22X31A7231	3						4			2						3			9	**5**
32	22X31A7232	1						5			2						2			9	**5**
33	22X31A7233	5			5			5			5									10	**5**
34	22X31A7234	1			2						5						5			8	**5**
35	22X31A7235				5			4			5						4			10	**5**
36	22X31A7236	5			1			5			5						2			6	**5**
37	22X31A7237				4			4			5						5			7	**5**
38	22X31A7238	2			2						2			2						10	**5**
39	22X31A7239				5			5			4									9	**5**
40	22X31A7240										5									10	**5**
41	22X31A7241							5			4			5			4			10	**5**
42	22X31A7242	5						5			5			5						10	**5**
43	22X31A7243				4			5			4						2			9	**5**
44	22X31A7244	3						3			3						3			10	**5**
45	22X31A7245	4			5			3			5									10	**5**
46	22X31A7246	2			4			4			2			2						8	**5**
47	22X31A7247				3			2			2			3						7	**5**
48	22X31A7248	5			5			3						5			0			7	**5**
49	22X31A7249	5			5			4									5			10	**5**
50	22X31A7250				4			3			5						0			7	**5**
51	22X31A7251				3			3			5			5						7	**5**
52	22X31A7252	3			2			3			3									9	**5**
53	22X31A7253	5			5			5									5			10	**5**
54	22X31A7254	3			3			3									3			8	**5**
55	22X31A7255	3			3			3			4									7	**5**
56	22X31A7256	3			3			3									5			8	**5**
57	22X31A7257	5									4			5			5			10	**5**
58	22X31A7258				5			4									4			7	**5**
59	22X31A7259	5			5			5			5									7	**5**
60	22X31A7260	4			3			4						5						7	**5**
61	22X31A7261	4						4			5						4			10	**5**
62	22X31A7262	5			5			5			4									7	**5**
63	22X31A7263	2						2			2						1			10	**5**
64	22X31A7264				2												3			10	**5**

Target set by the faculty / HoD	3.00	0.00	0.00	3.00	0.00	0.00	3.00	0.00	0.00	3.00	0.00	0.00	3.00	0.00	0.00	3.00	0.00	0.00	6.00	3.00
Number of students performed above the target	27	0	0	33	0	0	46	0	0	33	0	0	13	0	0	31	0	0	63	63
Number of students attempted	41	0	0	45	0	0	51	0	0	42	0	0	17	0	0	42	0	0	63	63
Percentage of students scored more than target	66%			73%			90%			79%			76%			74%			100%	100%

CO Mapping with Exam Questions:

CO - 1	Y			Y			Y											Y	Y
CO - 2																		Y	Y
CO - 3										Y			Y					Y	Y
CO - 4																Y		Y	Y
CO - 5																			
CO - 6																			
>Target %	66%			73%			90%			79%			76%			74%		100%	100%

CO Attainment based on Exam Questions:

CO - 1	66%			73%			73%											100%	100%
CO - 2																		100%	100%
CO - 3										90%			90%					100%	100%
CO - 4																90%		100%	100%
CO - 5																			
CO - 6																			

CO	Subj	obj		Asgn	Overall	Level
CO-1	71%	82%		100%	84%	3.00
CO-2		100%		100%	100%	3.00
CO-3	90%	93%		100%	95%	3.00
CO-4	90%	95%		100%	95%	3.00
CO-5						
CO-6						

Attainment (Internal 1 Examination) **3.00**

Attainment Level	
1	40%
2	50%
3	60%

SRI INDU INSTITUTE OF ENGINEERING AND TECHNOLOGY

Department of Humanities & Sciences

Course Outcome Attainment (Internal Examination-2)

Name of the facu	K.MOUNIKA	Academic Year:	2022-2023
Branch & Sectio	AI&DS	Examination:	II Internal
Course Name:	ENGINEERING CHEMISTRY	Year: I	Semester: II

S.No	HT No.	Q1a	Q1b	Q1c	Q2a	Q2b	Q2c	Q3a	Q3b	Q3c	Q4a	Q4b	Q4c	Q5a	Q5b	Q5c	Q6a	Q6b	Q6c	Obj	A2	viva/ ppt
0		5			5			5			5			5			5			10	5	5
1	22X31A7201	5						5			3						4			9	5	5
2	22X31A7202	3			2						3			2						8	5	5
3	22X31A7203							5			5			5			5			10	5	5
4	22X31A7204	5			5						2			5						10	5	5
5	22X31A7205							4			5			4			4			10	5	5
6	22X31A7206	5						3						4						10	5	5
7	22X31A7207	3						5			5			5						10	5	5
8	22X31A7208	3			1			4			2						4			10	5	5
9	22X31A7209				1			4			4			5						10	5	5
10	22X31A7210	1						4						4			4			10	5	5
11	22X31A7211	2												4			3			9	5	5
12	22X31A7212	1						4			1			3						9	5	5
13	22X31A7213	2						3						4			4			10	5	5
14	22X31A7214				1			2			3			3						10	5	5
15	22X31A7215	3						3						4			4			4	5	5
16	22X31A7216	1						1			3						1			10	5	5
17	22X31A7217							5			5			5			5			7	5	5
18	22X31A7218							4			3			5			3			8	5	5
19	22X31A7219	4									5			5			4			8	5	5
20	22X31A7220							2			1			3			3			7	5	5
21	22X31A7221	3			1						0			3			2			8	5	5
22	22X31A7222	4			5			4			5									10	5	5
23	22X31A7223	4						4			4						4			7	5	5
24	22X31A7224							1			3			3			2			7	5	5
25	22X31A7225	3						3						3			2			9	5	5
26	22X31A7226							4			5			5			5			7	5	5
27	22X31A7227							5			4			5			3			9	5	5
28	22X31A7228	2						3			2			4						8	5	5
29	22X31A7229	2									2			3			1			7	5	5
30	22X31A7230	1			1						2			3						10	5	5
31	22X31A7231							3			3			4			2			8	5	5
32	22X31A7232	3									3			4			3			9	5	5
33	22X31A7233				5			4			4			4						10	5	5
34	22X31A7234							3			5			4			4			9	5	5
35	22X31A7235							4			5			4			4			9	5	5
36	22X31A7236	5						3			5			3						8	5	5
37	22X31A7237				2			3			4			4						9	5	5
38	22X31A7238	2						3			3						3			4	5	5
39	22X31A7239				2						3			5			1			7	5	5
40	22X31A7240	2			3															10	2	5
41	22X31A7241							4			2			3			2			10	5	5
42	22X31A7242	5			5			5						5						10	5	5
43	22X31A7243	3									5			4			3			8	5	5
44	22X31A7244	4			3			3						4			4			5	5	5
45	22X31A7245	4			4			4						2			4			8	5	5
46	22X31A7246	2									1			5						8	5	5
47	22X31A7247	1			1			1						3						10	2	5
48	22X31A7248	5			5			5			3						4			9	5	5
49	22X31A7249	5									5			4			5			8	5	5
50	22X31A7250	3			2			2			1			4						7	5	5
51	22X31A7251	1			4			4						4			4			8	5	5
52	22X31A7252				2			2						3			4			7	5	5
53	22X31A7253	5									5			5			4			7	5	5
54	22X31A7254				2			4			5			2						7	5	5
55	22X31A7255	4						5			5			4						8	5	5
56	22X31A7256				5			3						3			4			4	5	5
57	22X31A7257	5									4			5			3			7	5	5
58	22X31A7258	5			2			4						5						10	2	5
59	22X31A7259	5						4			5			5						9	5	5
60	22X31A7260	4						5						4			5			9	5	5
61	22X31A7261	3						3						3			4			8	5	5
62	22X31A7262							4			3			5			5			6	5	5
63	22X31A7263	2												1			2			10	5	5
64	22X31A7264				3			3									1			8	2	5

Target set by the faculty / HoD	3.00	0.00	0.00	3.00	0.00	0.00	3.00	0.00	0.00	3.00	0.00	0.00	3.00	0.00	0.00	3.00	0.00	0.00	6.00	3.00	3.00
Number of students performed above the target	28	0	0	11	0	0	41	0	0	34	0	0	51	0	0	32	0	0	60	59	63
Number of students attempted	42	0	0	24	0	0	48	0	0	45	0	0	55	0	0	42	0	0	64	63	63
Percentage of students scored more than target	67%			46%			85%			76%			93%			76%			94%	94%	100%

CO Mapping with Exam Questions:

CO - 1																				
CO - 2																				
CO - 3																				
CO - 4	Y																	Y	Y	Y
CO - 5				Y			Y											Y	Y	Y
CO - 6										Y			Y			y		Y	Y	Y

% Students Scored >Target %	67%			46%			85%			76%			93%			76%			94%	94%	100%

CO Attainment based on Exam Questions:

CO - 1																				
CO - 2																				
CO - 3																				
CO - 4	67%																	94%	94%	94%
CO - 5				67%			67%											94%	94%	94%
CO - 6										67%			67%			67%		94%	94%	100%

CO	Subj	obj	aasg	ppt	Overall	Level
CO-1						
CO-2						
CO-3						
CO-4	67%	94%	94%	94%	87%	3.00
CO-5	67%	94%	94%	94%	87%	3.00
CO-6	67%	94%	94%	100%	89%	3.00
Attainment (Internal Examination-2						**3.00**

Attainment Level	
1	40%
2	50%
3	60%

SRI INDU INSTITUTE OF ENGINEERING AND TECHNOLOGY

Department of Humanities & Sciences

Course Outcome Attainment (University Examinations)

Name of the faculty	K.MOUNIKA	Academic Year:	2022-2023
Branch & Section:	AI&DS	Year / Semester:	I/II
Course Name:	ENGINEERING CHEMISTRY		

S.No	Roll Number	Marks Secured	S.No	Roll Number	Marks Secured
1	22X31A7201	33	36	22X31A7236	41
2	22X31A7202	25	37	22X31A7237	36
3	22X31A7203	43	38	22X31A7238	27
4	22X31A7204	0	39	22X31A7239	34
5	22X31A7205	29	40	22X31A7240	14
6	22X31A7206	26	41	22X31A7241	38
7	22X31A7207	30	42	22X31A7242	34
8	22X31A7208	44	43	22X31A7243	28
9	22X31A7209	26	44	22X31A7244	27
10	22X31A7210	26	45	22X31A7245	30
11	22X31A7211	33	46	22X31A7246	21
12	22X31A7212	24	47	22X31A7247	14
13	22X31A7213	26	48	22X31A7248	41
14	22X31A7214	11	49	22X31A7249	38
15	22X31A7215	32	50	22X31A7250	26
16	22X31A7216	16	51	22X31A7251	35
17	22X31A7217	31	52	22X31A7252	28
18	22X31A7218	35	53	22X31A7253	36
19	22X31A7219	28	54	22X31A7254	26
20	22X31A7220	32	55	22X31A7255	24
21	22X31A7221	26	56	22X31A7256	22
22	22X31A7222	39	57	22X31A7257	46
23	22X31A7223	28	58	22X31A7258	30
24	22X31A7224	23	59	22X31A7259	44
25	22X31A7225	41	60	22X31A7260	41
26	22X31A7226	38	61	22X31A7261	33
27	22X31A7227	36	62	22X31A7262	35
28	22X31A7228	29	63	22X31A7263	6
29	22X31A7229	26	64	22X31A7264	6
30	22X31A7230	21			
31	22X31A7231	14			
32	22X31A7232	25			
33	22X31A7233	45			
34	22X31A7234	28			
35	22X31A7235	42			
Max Marks		60			

		Attainment Level	% students
Class Average mark	30		
Number of students performed above the target	31	1	40%
Number of successful students	64	2	60%
Percentage of students scored more than target	48%	3	>60%
Attainment level	**2**		

SRI INDU INSTITUTE OF ENGINEERING AND TECHNOLOGY

Department of Humanities & Sciences

Course Outcome Attainment

Name of the facult	K.MOUNIKA	Academic Year	2022-2023
Branch & Section:	AI&DS	Examination:	I Internal
Course Name:	ENGINEERING CHEMISTRY	Year:	I
		Semester:	II

Cour se Outcomes	1st Inter nal Exam	2nd Inter nal Exam	Inter nal Exam	University Exam	Attainment Level
CO1	3.00		3.00	2.00	2.30
CO2	3.00		3.00	2.00	2.30
CO3	3.00		3.00	2.00	2.30
CO4	3.00	3.00	3.00	2.00	2.30
CO5		3.00	3.00	2.00	2.30
CO6		3.00	3.00	2.00	2.30
Inter nal & Univer sity Attainment:			3.00	2.00	
Weightage			30%	70%	
CO Attainment for the cour se (Inter nal, Univer sity			0.90	1.40	
CO Attainment for the cour se (Dir ect Method)			2.30		

Overall course attainment level 2.30

SRI INDU INSTITUTE OF ENGINEERING & TECHNOLOGY

Department of Humanities & Sciences

Program Outcome Attainment (from Course)

Name of Faculty:	K.MOUNIKA	Academic Year:	2022-2023
Branch & Section:	AI&DS	Year:	I
Course Name:	ENGINEERING CHEMISTRY	Semester:	II

CO-PO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	2				1	1					2		
CO2	2	2			1	1	1					1		
CO3	2	2					1							
CO4	2					1	1					1		
CO5	2	2					1							
CO6	2	1			1	1	1					1		
Course	2.00	1.80			1	1	1					1		

CO	Course Outcome Attainment
CO1	2.30
CO2	2.30
CO3	2.30
CO4	2.30
CO5	2.30
CO6	2.30
Overall course attainment level	2.30

PO-ATTAINMENT

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO Attainment	1.53	1.35			0.77	0.77	0.77					0.77

CO contribution to PO - 33%, 67%, 100% (Level 1/2/3)

SRI INDU INSTITUTE OF ENGINEERING AND TECHNOLOGY

(UGC AUTONOMOUS INSTITUTION)

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(Approved by AICTE, New Delhi and Affiliated to JNTUH, Hyderabad)

Khalsa Ibrahimpatnam, Sheriguda(V), Ibrahimpatnam(M), Ranga Reddy Dist., Telangana – 501510

ATTENDANCE REGISTER

https://drive.google.com/file/d/1K9wjyHrttEFIakHKyywA94FcCj7Cb7Ib/view?usp=sharing