



COURSE FILE

ON

ELECTRONIC MEASUREMENTS AND INSTRUMENTATION

Course Code - EC513PE

III B.Tech I-SEMESTER

A.Y.: 2022-2023

Prepared by

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Assistant Professor

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Electronics and Communication Engg. Dept
SRI INDU INSTITUTE OF ENGG & TECH
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PRINCIPAL
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<https://siiet.ac.in>



DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Academic Year	2022-2023
Course Title	ELECTRONIC MEASUREMENTS AND INSTRUMENTATION
Course Code	EC513PE
Programme	B.Tech
Year & Semester	III year I-semester
Branch & Section	ECE-A
Regulation	R18
Course Faculty	Mr. M GANESH, Assistant Professor

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INSTITUTE VISION AND 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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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

DEPARTMENT VISION AND MISSION

Vision:

To become a recognized center in the field of Electronics and Communication Engineering by producing creative engineers with social responsibility and address ever-changing global challenges.

Mission:

DM1: To facilitate an academic environment that enables student's centric learning.

DM2: To provide state-of-the-art hardware and software technologies to meet industry requirements.

DM3: To continuously update the Academic and Research infrastructure.

DM4: To Conduct Technical Development Programs for overall professional caliber of Stake Holders.

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PROGRAM EDUCATIONAL OBJECTIVES

Program Educational objectives are to Promote:

PEO1: Graduates with a strong foundation in Electronics and Communication Engineering, Science and Technology to become successful in the chosen professional career.

PEO2: Graduates with ability to execute innovative ideas for Research and Development with continuous learning.

PEO3: Graduates inculcated with industry based soft-skills to enable employability.

PEO4: Graduates demonstrate with ability to work in interdisciplinary teams and ethical professional behavior.

PROGRAM SPECIFIC OUTCOMES

PSO 1: Design Skills: Design, analysis and development a economical system in the area of Embedded system & VLSI design.

PSO 2: Software Usage: Ability to investigate and solve the engineering problems using MATLAB, Keil and Xilinx.

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PROGRAM OUTCOMES

1. **ENGINEERING KNOWLEDGE:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **PROBLEM ANALYSIS:** Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **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.
4. **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.
5. **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.
6. **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.
7. **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.
8. **ETHICS:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **INDIVIDUAL AND TEAM WORK:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **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.
11. **PROJECT MANAGEMENT AND FINANCE:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12. **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.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD**B.Tech. in ELECTRONICS AND COMMUNICATION ENGINEERING****III YEAR COURSE STRUCTURE AND SYLLABUS (R18)**

Applicable From 2018-19 Admitted Batch

III YEAR I SEMESTER

S. No.	Course Code	Course Title	L	T	P	Credits
1	EC501PC	Microprocessors & Microcontrollers	3	1	0	4
2	EC502PC	Data Communications and Networks	3	1	0	4
3	EC503PC	Control Systems	3	1	0	4
4	SM504MS	Business Economics & Financial Analysis	3	0	0	3
5		Professional Elective - I	3	0	0	3
6	EC505PC	Microprocessors & Microcontrollers Lab	0	0	3	1.5
7	EC506PC	Data Communications and Networks Lab	0	0	3	1.5
8	EN508HS	Advanced Communication Skills Lab	0	0	2	1
9	*MC510	Intellectual Property Rights	3	0	0	0
		Total Credits	18	3	8	22

III YEAR II SEMESTER

S. No.	Course Code	Course Title	L	T	P	Credits
1	EC601PC	Antennas and Propagation	3	1	0	4
2	EC602PC	Digital Signal Processing	3	1	0	4
3	EC603PC	VLSI Design	3	1	0	4
4		Professional Elective - II	3	0	0	3
5		Open Elective - I	3	0	0	3
6	EC604PC	Digital Signal Processing Lab	0	0	3	1.5
7	EC605PC	e – CAD Lab	0	0	3	1.5
8	EC606PC	Scripting Languages Lab	0	0	2	1
9	*MC609	Environmental Science	3	0	0	0
		Total Credits	18	3	8	22

***MC - Environmental Science – Should be Registered by Lateral Entry Students Only.**

Note: Industrial Oriented Mini Project/ Summer Internship is to be carried out during the summer vacation between 6th and 7th semesters. Students should submit report of Industrial Oriented Mini Project/ Summer Internship for evaluation.

Professional Elective – I

EC511PE	Computer Organization & Operating Systems
EC512PE	Error Correcting Codes
EC513PE	Electronic Measurements and Instrumentation

Professional Elective – II

EC611PE	Object Oriented Programming through Java
EC612PE	Mobile Communications and Networks
EC613PE	Embedded System Design

EC513PE: ELECTRONIC INSTRUMENTATION AND MEASUREMENTS

B.Tech. III Year I Semester

L T P C

3 1 0 4

Prerequisite: Basic Electrical and Electronics Engineering

Course Objectives:

1. It provides an understanding of various measuring system functioning and metrics for performance analysis.
2. Provides understanding of principle of operation, working of different electronic instruments viz. signal generators, signal analyzers, recorders and measuring equipment.
3. Understanding the concepts of various measuring bridges and their balancing conditions.
4. Provides understanding of use of various measuring techniques for measurement of different physical parameters using different classes of transducers.

Course Outcomes: Upon completing this course, the student will be able to

1. Measure electrical parameters with different meters and understand the basic definition of measuring parameters.
2. Use various types of signal generators, signal analyzers for generating and analyzing various real-time signals.
3. Operate an Oscilloscope to measure various signals.
4. Measure various physical parameters by appropriately selecting the transducers.

UNIT - I: Block Schematics of Measuring Systems: Performance characteristics, Static characteristics, Accuracy, Precision, Resolution, Types of Errors, Gaussian Error, Root Sum Squares formula, Dynamic Characteristics, Repeatability, Reproducibility, Fidelity, Lag; Measuring Instruments: DC Voltmeters, D'Arsonval Movement, DC Current Meters, AC Voltmeters and Current Meters, Ohmmeters, Multimeters, Meter Protection, Extension of Range, True RMS Responding Voltmeters, Specifications of Instruments.

UNIT - II: Signal Analyzers: AF, HF Wave Analyzers, Harmonic Distortion, Heterodyne wave Analyzers, Spectrum Analyzers, Power Analyzers, Capacitance-Voltage Meters, Oscillators. Signal Generators: AF, RF Signal Generators, Sweep Frequency Generators, Pulse and Square wave Generators, Function Generators, Arbitrary waveform Generator, Video Signal Generators, and Specifications.

UNIT - III: Oscilloscopes: CRT, Block Schematic of CRO, Time Base Circuits, Lissajous Figures, CRO Probes, High Frequency CRO Considerations, Delay lines, Applications: Measurement of Time, Period and Frequency Specifications.

Special Purpose Oscilloscopes: Dual Trace, Dual Beam CROs, Sampling Oscilloscopes, Storage Oscilloscopes, Digital Storage CROs.

UNIT - IV: Transducers: Classification, Strain Gauges, Bounded, unbounded; Force and Displacement Transducers, Resistance Thermometers, Hotwire Anemometers, LVDT, Thermocouples, Synchronous, Special Resistance Thermometers, Digital Temperature sensing system, Piezoelectric Transducers, Variable Capacitance Transducers, Magneto Strictive Transducers, gyroscopes, accelerometers.

UNIT - V: Bridges: Wheat Stone Bridge, Kelvin Bridge, and Maxwell Bridge Measurement of Physical Parameters: Flow Measurement, Displacement Meters, Liquid level Measurement, Measurement of Humidity and Moisture, Velocity, Force, Pressure - High Pressure, Vacuum level, Temperature - Measurements, Data Acquisition Systems.

.TEXT BOOKS:

Electronic Instrumentation, - H.S.Kalsi, 2nd Edition, Tata McGraw Hill, 2004.

Electronic Measurements and Instrumentation-K.LalKishore,Pearson Education, 2010

REFERENCES:

Electronic Instrumentation and Measurements -David, Bell

Electronic measurements and Instrumentation – B. M. Oliver and J.M. Cage, TMH, 2009.

Modern Electronic Instrumentation and Measurement Techniques A.D.Helfrick

and W.D. Cooper, 5thEdition, PHI, 2003

Industrial Instrumentation: T. R. Padmanadham Springer 2009.



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COs and Mapping with PO/PSO

Course: ELECTRONIC MEASUREMENTS AND INSTRUMENTATION (C315)

Class: III ECE-A

Course Outcomes

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

C315.1: Analyze the various electronic instruments based on their specifications for carrying out a particular task of measurements.(Analysis)

C315.2: Explain the various types of signal generators, signal analyzers for generating and analyzing various real time signals. (Knowledge and Analysis)

C315.3: Define the different types of oscilloscopes and the characteristics of the signals. (Knowledge)

C315.4: Compare different types of transducer like piezoelectric and magneto strictive Transducers. (Analysis)

C315.5: Define and distinguish the types of bridges and measuring the physical parameters like Humidity, moisture, velocity and force. (Knowledge and Analysis)

C315.6: Relate the use of measuring instruments in real time applications. (Evaluation)

Mapping of course outcomes with program outcomes:

High -3 Medium -2 Low-1

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C315.1	2	3	-	-	3	-	-	-	-	-	-	2	-	-
C315.2	2	3	-	-	2	-	-	-	-	-	-	2	-	-
C315.3	2	3	-	-	3	-	-	-	-	-	-	3	-	-
C315.4	3	3	-	-	3	-	-	-	-	-	-	2	-	-
C315.5	3	3	-	-	2	-	-	-	-	-	-	2	-	-
C315.6	2		-	-	-	-	-	-	-	-	-	-	-	-
C315	2.3	3	-	-	2.6	-	-	-	-	-	-	2.2	-	-



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Course : ELECTRONIC MEASUREMENTS AND INSTRUMENTATION (C315)

Class: III ECE-A

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 modeling to complex engineering activities with an understanding of the limitations.

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.

C315.1: Analyze the various electronic instruments based on their specifications for carrying out a particular task of measurements. (Analysis)

	Justification
PO1	Students get the knowledge of Measuring Instruments like Voltmeters, Ammeters and Ohmmeters. (level 2)
PO2	Students solve problems of Measuring Instruments. (level 3)
PO5	Students can easily analyse by using different instruments like transducers, voltmeters (level3)
PO12	Students can use various electronic instruments for solving different measurements. (level 2)

C315.2: Explain the various types of signal generators, signal analyzers for generating and analyzing various real time signals. (Knowledge and Analysis)

	Justification
PO1	Students acquire knowledge of Wave Analyzers and Signal Generators. (level 2)
PO2	Students can analyse the specifications of generators. (level 3)
PO5	Students can easily analyse frequency domain by using spectrum analyzer (level 3)
PO12	Students can understand various different signals for testing various electronic circuits (level 2)

C315.3: Define the different types of oscilloscopes and the characteristics of the signals. (Knowledge)

	Justification
PO1	Students get the knowledge of different type of Oscilloscopes (level 2)
PO2	Students can understand the specifications of signals (level 3)
PO5	Students acquires knowledge by using special purpose oscilloscope. (level 3)
PO12	Students can clearly understand the meaurment of frequency of signals. (level 3)

C315.4: Compare different types of transducers like piezoelectric and magneto strictive Transducers. (Analysis)

	Justification
PO1	Students get the knowledge of Bounded and Unbounded transducers.(level 3)
PO2	Students get acquire knowledge the types of transducers (level 3)
PO5	Students get familiar about strain gauge transducer ,potentiometer transducers to control electrical devices(level 3)
PO12	Students acquire knowledge about transduction principle. (level 2)

C315.5: Define and distinguish the types of bridges and measuring the physical parameters like Humidity, moisture, velocity and force. (Knowledge and Analysis)

	Justification
PO1	Students get the knowledge of Different types of bridges.(level 3)
PO2	Students solve problems on Bridges (level 3)
PO5	Students acquire necessary data for speed and time by using data acquisition technique. (level 2)
PO12	Students can convert digital data into analog by using D/A Converter. (level 2)

C315.6: Relate the use of measuring instruments in real time applications. (Evaluation)

	Justification
PO1	Get the knowledge of Measuring Instruments (level 3)

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD**ACADEMIC CALENDAR 2022-23****B. Tech./B. Pharm. III YEAR I & II SEMESTERS****I SEM**

S. No	Description	Duration	
		From	To
1	Commencement of I Semester classwork	09.09.2022	
2	1 st Spell of Instructions (including Dussehra Recess)	09.09.2022	10.11.2022 (9 Weeks)
3	Dussehra Recess	03.10.2022	08.10.2022 (1 Week)
4	First Mid Term Examinations	11.11.2022	17.11.2022 (1 Week)
5	Submission of First Mid Term Exam Marks to the University on or before	24.11.2022	
6	2 nd Spell of Instructions	18.11.2022	12.01.2023 (8 Weeks)
7	Second Mid Term Examinations	16.01.2023	21.01.2023 (1 Week)
8	Preparation Holidays and Practical Examinations	23.01.2023	28.01.2023 (1 Week)
9	Submission of Second Mid Term Exam Marks to the University on or before	30.01.2023	
10	End Semester Examinations	30.01.2023	11.02.2023 (2 Weeks)

Note: No. of Working/ instructional days: 92

II SEM

S. No	Description	Duration	
		From	To
1	Commencement of II Semester classwork	13.02.2023	
2	1 st Spell of Instructions	13.02.2023	08.04.2023 (8 Weeks)
3	First Mid Term Examinations	10.04.2023	15.04.2023 (1 Week)
4	Submission of First Mid Term Exam Marks to the University on or before	22.04.2023	
5	2 nd Spell of Instructions (including Summer Vacation)	17.04.2023	24.06.2023 (10 Weeks)
6	Summer Vacation	15.05.2023	27.05.2023 (2 Weeks)
7	Second Mid Term Examinations	26.06.2023	01.07.2023 (1 Week)
8	Preparation Holidays and Practical Examinations	03.07.2023	08.07.2023 (1 Week)
9	Submission of Second Mid Term Exam Marks to the University on or before	08.07.2023	
10	End Semester Examinations	10.07.2023	22.07.2023 (2 Weeks)

Note: No. of Working/ instructional days: 90


REGISTRAR



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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Class Timetable

CLASS: III-B.Tech ECE-A

A.Y:2022-23

SEMESTER: I

LH: C-201

TIME/ DAY	I 9:40-10:30	II 10:30 -11:20	III 11:20-12:10	IV 12:10-1:00	1:00-1:30	V 1:30-2:20	VI 2:20-3:10	VII 3:10-4:00
MON	DCN	IPR	CS	LIB	L U N C H	MPMC LAB / DCN LAB		
TUE	CS	MPMC	EMI	DCN		CYB	BEFA	SPORTS
WED	CYB	MPMC(T)/DCN(T)	CS	EMI		DCN LAB / MPMC LAB		
THU	EMI	DCN	CO-CU/DAA			IPR	MPMC	CS(T)/MPMC(T)
FRI	CS	BEFA	EMI	MPMC		DCN(T)/CS(T)	ACS LAB	
SAT	MPMC	IPR	MPMC(ADJUNCT)			BEFA	DCN	COUN

*(T) – Tutorial Concern Faculty

Course Code	Course Name	Name of the Faculty	Course Code	Course Name	Name of the Faculty
EC501PC	MPMC- Microprocessors & Microcontrollers	I.Venu	EC505PC	MPMC LAB- Microprocessors & Microcontrollers Lab	I.Venu/K.Srikanth/P.Srilatha
EC502PC	DCN-Data Communications and Networks	Y.Raju	EC506PC	DCN LAB- Data Communications and Networks Lab	J.Anand Rao/ M.Ganesh/Y.Raju
EC503PC	CS-Control Systems	K.Srikanth	EN508HS	ACS LAB- Advanced Communication Skills Lab	D.Ananda Rao
SM504MS	BEFA- Business Economics & Financial Analysis	K V Nagamani	*MC510	IPR-Intellectual Property Rights	S.Srinivas
			MPMC(ADJUNCT)	G.Chandrasekhar	
EC513PE	EMI-Electronic Measurements and Instrumentation (PE-I)	M.Ganesh	LIB	Library	B.Jyothirmai/S.Alekhyia
			COUN	Counseling	Dr.S.Suresh/S.Alekhyia/M.Ganesh
*CYB	Cyber Security	T.Divya	CO-CU/DAA	Co-Curricular/Dent.Assc.Act.	M.Ganesh/S.Naresh/P.KrishnaRao
			SPORTS	Sports	M.Ganesh/S.Naresh/P.KrishnaRao

Class Incharge

Head of the Department
Department of Engg- Dept
Electronics and Communication Engg- Dept
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LESSON PLAN

Programme: B.Tech	Academic Year: 2022-23
Year: III	Semester: I
Course Title: ELECTRONIC MEASUREMENTS & INSTRUMENTATION	Course Code: EC513PE
Name of Faculty: M GANESH	

Unit-I Syllabus

Block Schematics of Measuring Systems: Performance characteristics, Static characteristics, Accuracy, Precision, Resolution, Types of Errors, Gaussian Error, Root Sum Squares formula, Dynamic Characteristics, Repeatability, Reproducibility, Fidelity, Lag; Measuring Instruments: DC Voltmeters, D'Arsonval Movement, DC Current Meters, AC Voltmeters and Current Meters, Ohmmeters, Multimeters, Meter Protection, Extension of Range, True RMS Responding Voltmeters, Specifications of Instruments.

No. of Sessions Planned	Topics	Reference	Teaching Method/ Aids
1	Block Schematics of Measuring Systems	T2, R 1	BB
1	Performance characteristics	T2, R 1	BB
1	Static characteristics, Accuracy, Precision, Resolution	T2, R 1	BB
1	Types of Errors	T2, R 2	BB
1	Gaussian Error	T2, R 2	BB
1	Root Sum Squares formula	T1, R2	BB
1	Dynamic Characteristics, Repeatability,	T1, R2	BB
1	Reproducibility, Fidelity, Lag	T1	BB
2	Measuring Instruments, DC Voltmeters	T1, R1	BB
2	D'Arsonval Movement	T1, R1	BB
1	DC Current Meters, AC Voltmeters, Current Meters	T1	BB
2	Ohmmeters, Multimeters, Meter Protection	T1	BB
2	Extension of Range, True RMS Responding Voltmeters	T1, R2	BB
1	Specifications of Instruments, SOME PROBLEMS	T1, R2	BB
Gap beyond syllabus(if any):			
Gap within the syllabus(if any)			
Course Outcome 1: Analyze the various measurements based on their specifications for carrying out a particular task of measurements.(Analysis)			

*Session Duration: 50 minutes

*Total Number of Hours/Unit: 18



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Unit-II Syllabus:

Signal Analyzers: AF, HF Wave Analyzers, Harmonic Distortion, Heterodyne wave Analyzers, Spectrum Analyzers, Power Analyzers, Capacitance-Voltage Meters, Oscillators. Signal Generators: AF, RF Signal Generators, Sweep Frequency Generators, Pulse and Square wave Generators, Function Generators, Arbitrary waveform Generator, Video Signal Generators, and Specifications.

No. of Sessions Planned	Topics	Reference	Teaching Method/ Aids
2	Signal Analyzers	T1, R 2	BB
2	AF, HF Wave Analyzers	T2, R 2	BB
1	Harmonic Distortion	T2, R 2	BB
1	Heterodyne wave Analyzers, Spectrum Analyzers, Power Analyzers	T2, R 1	BB
1	Capacitance-Voltage Meters, Oscillators.	T2	BB
1	Signal Generators: AF, RF Signal Generators	T2, R1	BB
2	Sweep Frequency Generators.	T2, R2	BB
1	Pulse and Square wave Generators.	T1	BB
1	Function Generators, Arbitrary waveform Generator,	T2	BB
1	Video Signal Generators	T1, R 2	BB
2	Specifications.	T2, R 1	BB
Gap beyond syllabus (if any):			
Gap within the syllabus (if any)			
Course Outcome 1: Explain the various types of signal generators, signal analyzers for generating and analyzing various real time signals. (Knowledge and Analysis)			

*Session Duration: 50 minutes

*Total Number of Hours/Unit: 15



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Unit-III Syllabus:

Oscilloscopes: CRT, Block Schematic of CRO, Time Base Circuits, Lissajous Figures, CRO Probes, High Frequency CRO Considerations, Delay lines, Applications: Measurement of Time, Period and Frequency Specifications.

Special Purpose Oscilloscopes: Dual Trace, Dual Beam CROs, Sampling Oscilloscopes, Storage Oscilloscopes, Digital Storage CROs

No. of Sessions Planned	Topics	Reference	Teaching Method/Aids
1	Oscilloscopes: CRT, Block Schematic of CRO	T1,R1	BB
2	Time Base Circuits, Lissajous Figures	T1	BB
2	CRO Probes, High Frequency CRO Considerations	T1, R 1	BB
2	Delay lines	T1, R 1	BB
2	Applications: Measurement of Time	T1, R 1	BB
1	Period and Frequency Specifications	T1, R 2	BB
1	Special Purpose Oscilloscopes:	T1, R 1	BB
2	Dual Trace ,Dual Beam CROs	T1, R2	BB
1	Sampling Oscilloscopes	R1	BB
1	Storage Oscilloscopes	T2,R2	BB
1	Digital Storage CROs	T2	BB
Gap beyond syllabus(if any):			
Gap within the syllabus(if any)			
Course Outcome: Define the different types of oscilloscopes and the characteristics of the signals.(Knowledge)			

*Session Duration: 50minutes

*Total Number of Hours/Unit: 16



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

Website: <https://siiet.ac.in/>

Unit-IV Syllabus

Transducers: Classification, Strain Gauges, Bounded, unbounded; Force and Displacement Transducers, Resistance Thermometers, Hotwire Anemometers, LVDT, Thermocouples, Synchronous, Special Resistance Thermometers, Digital Temperature sensing system, Piezoelectric Transducers, Variable Capacitance Transducers, Magneto Strictive Transducers, gyroscopes, accelerometers.

No. of Sessions Planned	Topics	Reference	Teaching Method/ Aids
1	Transducers:	T2,R2	BB
1	Classification, Strain Gauges	R2	BB
1	Bounded, unbounded	T2,R1	BB
1	Force and Displacement Transducers	T2, R2	BB
1	Resistance Thermometers	T2, R 1	BB
2	Hotwire Anemometers ,LVDT	T2	BB
1	Thermocouples, Synchronous	T2	BB
1	Special Resistance Thermometers	T2, R1	BB
1	Digital Temperature sensing system,	T2,R2	BB
1	Piezoelectric Transducers, Variable Capacitance Transducers	R2	BB
1	Magneto Strictive Transducers, gyroscopes, accelerometers.	T2,R2	BB
Gap beyond syllabus(if any):			
Gap within the syllabus(if any)			
Course Outcome: : Compare different types of transducer like piezoelectric and magneto strictive. Transducers. (Analysis)			

*Session Duration: 50minutes

*Total Number of Hours/Unit: 12



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Unit-V Syllabus

Bridges: Wheat Stone Bridge, Kelvin Bridge, and Maxwell Bridge Measurement of Physical Parameters: Flow Measurement, Displacement Meters, Liquid level Measurement, Measurement of Humidity and Moisture, Velocity, Force, Pressure - High Pressure, Vacuum level, Temperature - Measurements, Data Acquisition Systems.

No. of Sessions Planned	Topics	Reference	Teaching Method/ Aids
2	Bridges: Wheat Stone Bridge	T2,R2	BB
1	Kelvin Bridge, and Maxwell Bridge	T2,R2	BB
1	Measurement of Physical Parameters	T2	BB
1	Flow Measurement,	T1, R 1	BB
2	Displacement Meters	T1, R 1	BB
2	Liquid level Measurement	T1	BB
1	Measurement of Humidity and Moisture	T2	BB
1	Velocity, Force	T1, R 1	BB
2	Pressure - High Pressure, Vacuum level	T2, R 1	BB
1	Temperature - Measurements	T2, R 2	BB
1	Data Acquisition Systems	T1, R 2	BB
Gap beyond syllabus(if any):			
Gap within the syllabus(if any)			
Course Outcome 1: Define and distinguish the types of bridges and measuring the physical parameters like Humidity, moisture, velocity and force. (Knowledge and Analysis)			
Course Outcome 2: Relate the use of measuring instruments in real time applications. (Evaluation)			

*Session Duration: 50minutes

*Total Number of Hours/Unit: 16

Text Books	
Text 1	Electronic Instrumentation, - H.S.Kalsi, 2nd Edition, Tata McGraw Hill, 2004.
Text 2	Electronic Measurements and Instrumentation-K.LalKishore,Pearson Education, 2010

Reference Books	
Ref 1	Electronic Instrumentation and Measurements -David, Bell
Ref 2	Electronic measurements and Instrumentation – B. M. Oliver and J.M. Cage, TMH, 2009.
Ref 3	Modern Electronic Instrumentation and Measurement Techniques A.D.Helfrick and W.D. Cooper, 5thEdition, PHI, 2003
Ref 4	Industrial Instrumentation: T. R. Padmanadham Springer 2009.

WEB REFERENCES:

Websites	
W1	https://www.tutorialspoint.com/electronic_measuring_instruments/electronic_measuring_instruments_performance_characteristics.htm
W2	https://circuitglobe.com/permanent-magnet-moving-coil-or-pmmc-instrument.html
W3	https://www.elprocus.com/cro-cathode-ray-oscilloscope-working-and-application/
W4	https://circuitglobe.com/maxwells-bridge.html
W5	https://www.tutorialspoint.com/electronic_measuring_instruments/electronic_measuring_instruments_data_acquisition_systems.htm#



Lecture notes

Unit 1 link:

<https://drive.google.com/file/d/1a7pRQIOPhPGMtwhP0Ws4pRUZCn34i5Dx/view?usp=sharing>

Unit 2 link:

<https://drive.google.com/file/d/1Cs52TL4MuscRmgVs-947RFBpcmjCPumH/view?usp=sharing>

Unit 3 link:

<https://drive.google.com/file/d/1RrZMuwts9Pbbn8ylr7fx6QP4I9WLyZ7E/view?usp=sharing>

Unit 4 link:

<https://drive.google.com/file/d/1aHVcUP4mU2OrtAyjSDo3MJIpJPsbLrj/view?usp=sharing>

Unit 5 link:

<https://drive.google.com/file/d/1ccEXvHEeNyjnXbFeUAjLxp7DBK Tv89Jb/view?usp=sharing>



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Website: <https://siiet.ac.in/>

Power point presentation

PPT link:

**[https://drive.google.com/file/d/1eqVo8LUBAHzkLz8E1qrdT0eYKI
ZwiGWh/view?usp=sharing](https://drive.google.com/file/d/1eqVo8LUBAHzkLz8E1qrdT0eYKIZwiGWh/view?usp=sharing)**

Code No: 155BC

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year I Semester Examinations, August - 2022

ELECTRONIC MEASUREMENTS AND INSTRUMENTATION

(Electronics and Communication Engineering)

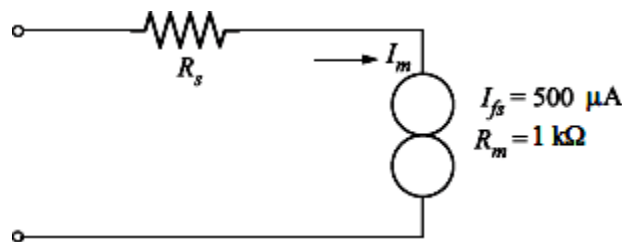
Time: 3 Hours

Max. Marks: 75

Answer any five questions
All questions carry equal marks

- - -

- 1.a) Draw the block diagram of measuring system. Explain the function of each block.
b) Explain the static characteristics of measuring system. [8+7]
- 2.a) With the help of a schematic diagram, explain how the true *r.m.s* value of a given Input is determined by the meter. What are its salient features?
b) Calculate the value of the multiplier resistance on the 50 V- range of a DC voltmeter that uses a $500\mu\text{A}$ meter movement with an internal resistance of $1\text{ k}\Omega$ shown in figure below. [9+6]



- 3.a) Draw the block schematic of AF wave analyzers and explain the principle of working.
b) Draw the Block diagram of a heterodyne wave analyzer. [10+5]
- 4.a) Draw the block diagram of a function generator and explain its working.
b) In an ordinary phase shift oscillator $R_1 = R_2 = R_3 = 800\ \text{k}\Omega$, $C_1 = C_2 = C_3 = 100\ \text{pF}$, with usual notation. Find the frequency of oscillations. [10+5]
- 5.a) Draw the neat sketch of an analog storage CRT and explain its working.
b) State the various applications of CROs. [10+5]
- 6.a) Draw the Line schematic of a dual beam CRO. Explain its working.
b) A Lissajous pattern on a CRO is stationary and has six vertical maximum values and five horizontal maximum values. The frequency of the horizontal input is $1500\ \text{Hz}$. Determine the frequency of the vertical input. [10+5]
- 7.a) Explain the working principle of piezoelectric transducers.
b) Explain the working of variable capacitance transducers. [7+8]
- 8.a) Explain the principle of flow measurement using transducers.
b) Draw the circuit diagram of Maxwell Bridge for inductance measurements. Obtain an expression for unknown inductance by using this bridge. [7+8]

Code No: 155BC

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD**B. Tech III Year I Semester Examinations, February - 2022****ELECTRONIC MEASUREMENTS AND INSTRUMENTATION****(Electronics and Communication Engineering)****Time: 3 hours****Max. Marks: 75**

Answer any five questions
All questions carry equal marks

- - -

- 1.a) A basic D' Arsonval meter movement with an internal resistance, $R_m = 100\Omega$ and a full scale current of $I_m = 1mA$ is to be converted in to a multi range D.C. voltmeter with ranges of 0-10V, 0- 50V, 0- 250V,0-500V. Determine the values of various resistances required for potential divider arrangement.
- b) Explain the principle of working of true RMS responding voltmeter with a neat sketch and outline its applications [6+9]
- 2.a) Explain the principle of working of Function Generator with a neat sketch.
- b) Compare AF and HF Signal Generators. [7+8]
- 3.a) How can you measure frequency using Lissajous figures and time period method? Elaborate.
- b) Compare Analog Storage and Digital storage CROs. [7+8]
- 4.a) Explain the working principle of Gyroscope and summarize its application.
- b) Explain the working of digital temperature sensing system and summarize its limitation. [7+8]
- 5.a) How could you measure High pressure? Elaborate.
- b) Construct the bridge circuit to measure inductance and explain how can you measure using it and develop relation for unknown Inductance. [6+9]
- 6.a) Compare shunt ohmmeter and series ohmmeter.
- b) Explain the principle and working of heterodyne wave analyzer with a neat sketch, summarize its applications. [6+9]
- 7.a) Explain the block schematic of CRO with a neat sketch and summarize its applications.
- b) Describe the working principle of Piezoelectric transducers and summarize its application. [7+8]
- 8.a) Develop a data acquisition system for measuring 2 parameters and explain its working.
- b) What are the dynamic characteristics of measuring instruments? Define them. [7+8]

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R18

Code No: 155BC

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year I Semester Examinations, September - 2021

ELECTRONIC MEASUREMENTS AND INSTRUMENTATION

(Electronics and Communication Engineering)

Time: 3 hours

Max. Marks: 75

**Answer any five questions
All questions carry equal marks**

- 1.a) The pointer of d' Arsonval meter movement gives full scale deflection of 20mA. The potential difference across the meter when carrying 20mA is 400mV. Determine i) the shunt resistance required to design 0- 200A range ammeter. ii) the series resistance required to design 0- 1000V range voltmeter.
- b) Explain the principle of working of True RMS responding voltmeter and outline its applications. [7+8]
- 2.a) Compare shunt ohmmeter and series ohmmeter.
- b) How can you extend the range of Voltmeter? Elaborate with example. [7+8]
- 3.a) Explain the principle of working of Function Generator with a neat sketch.
- b) Conclude the need of Heterodyne wave Analyzers. [9+6]
- 4.a) Conclude the need of Video signal generators.
- b) Explain the principle and working of Spectrum Analyzer with a neat sketch. [6+9]
- 5.a) Conclude the need of Time Base Circuits in CRO.
- b) Explain the principle of working of sampling Oscilloscope with a neat sketch. [6+9]
- 6.a) How can you measure frequency and phase using Lissajous figures? Elaborate.
- b) Compare Analog Storage and Digital storage CROs. [8+7]
- 7.a) Explain the working principle of Synchros and summarize its application.
- b) Explain the working principle of Gyroscope and summarize its application. [8+7]
- 8.a) How could you measure Velocity? Elaborate.
- b) Construct the bridge circuit to measure inductance and develop relation for unknown Inductance. [7+8]

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Code No: 155BC

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year I Semester Examinations, March - 2021

ELECTRONIC MEASUREMENTS AND INSTRUMENTATION

(Electronics and Communication Engineering)

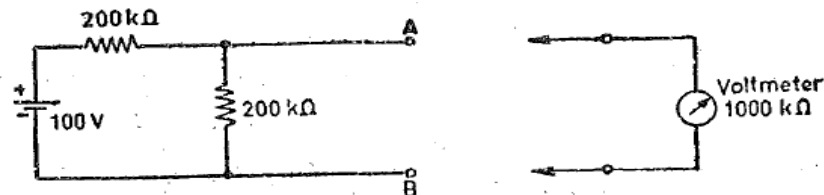
Time: 3 Hours

Max. Marks: 75

Answer any five questions
All questions carry equal marks

- - -

- 1.a) A 50 V range voltmeter is connected across terminals A and B of the circuit shown in figure. Find the reading of the voltmeter under open circuit and loaded conditions. Find the accuracy and the loading error. If the voltmeter has a resistance of 1000 k Ω .



- b) With help of a neat diagram, explain the block diagram of functional elements of the measurement system. [8+7]
- 2.a) Enumerate and explain the different types of dynamic characteristics of instruments.
b) With help of a neat diagram explain the construction and working of the True RMS responding voltmeter. [7+8]
- 3.a) With relevant block diagram explain the working of a standard signal generator.
b) With neat diagram explain the working of heterodyne wave analyzer. [7+8]
- 4.a) Briefly explain the working of the basic function generator with a neat diagram.
b) Explain the working of the AF wave analyzer with help of a neat diagram. [8+7]
- 5.a) With neat diagram, enumerate the main components of CRT.
b) Explain the working of a vertical amplifier with a relevant circuit diagram. [8+7]
- 6.a) With help of a neat diagram, explain the working of a sampling oscilloscope.
b) Explain the working of dual-beam CRO with relevant diagram. [8+7]
- 7.a) A resistive strain gauge $G = 2.2$ is cemented on a rectangular steel bar with the elastic modulus $E = 205 \times 10^6$ kN/m² width 3.5 cm and thickness 0.55 cm. An axial force of 12kN is applied. Determine the change of the resistance of the strain gauge, ΔR , if the normal resistance of the gauge is $R=100 \Omega$.
b) Briefly discuss the working of LVDT with neat block diagram. [7+8]
- 8.a) In the Wheatstone bridge, the values of resistances of various arms are $P= 1000 \Omega$, $Q= 100 \Omega$, $R= 2,005 \Omega$ and $S= 200 \Omega$. The battery has an emf of 5 V and negligible internal resistance. The galvanometer has a current sensitivity of 10 mm/ μ A and an internal resistance of 100 Ω . Calculate the deflection of the galvanometer and the sensitivity of the bridge in terms of deflection per unit change in resistance.
b) With help of a neat diagram, explain the working of turbine type flow meter. [8+7]

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Sheriguda (V), Ibrahimpatnam (M), R.R.Dist-501 510
I- Mid Examinations, NOV-2022

Set - I

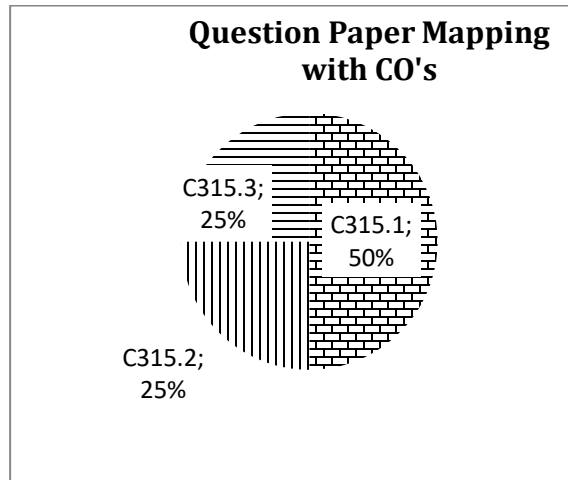
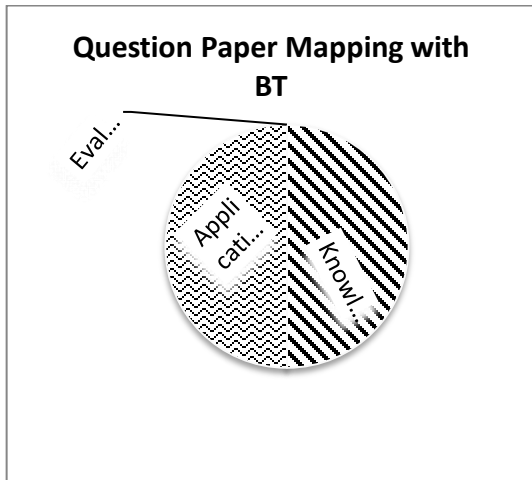
Year & Branch: III ECE
 Subject: **EMI** (A, B&C)

Max. Marks: 10

Date: 14/11/2022 (FN)
 Time: 60mins

Answer any **TWO** Questions. All Questions Carry Equal Marks
 2*5=10marks

1	Draw the block diagram of Function Generator ,and Explain each block.	(5)	C315.2	(Knowledge)
2	Draw and explain CRT	(5)	C315.3	(Application)
3	Explain Basic meter movement.	(5)	C315.1	(Application)
4	State and Explain the static characteristics	(5)	C315.1	(Knowledge)



Sri Indu Institute of Engineering & Technology

Shereguda (V), Ibrahimpatnam (M), R.R.Dist-501 510
B.Tech III-Year I-Sem II- Mid Examinations, Jan-2023

Set - I

Year & Branch: III ECE (Sec – A,B&C)

Date: 21 -01-2023

Subject: EMI (FN)

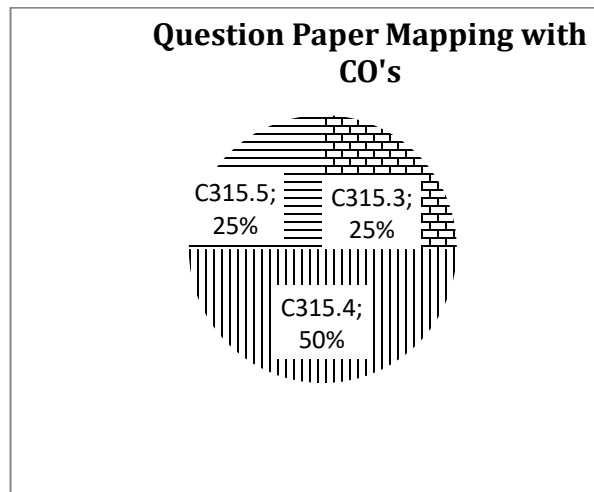
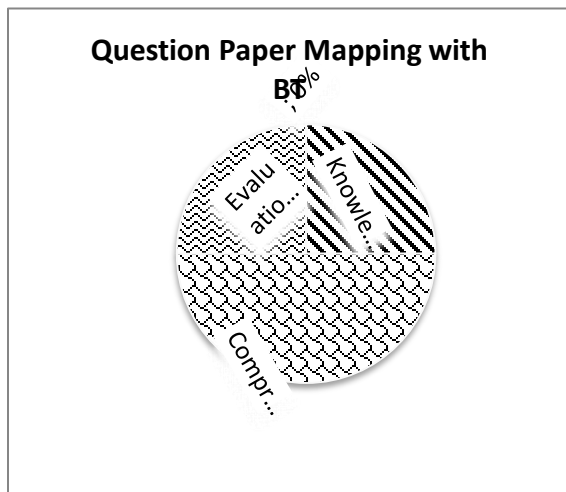
Max. Marks: 10

Time: 60 mins

Answer any **TWO** Questions. All Question Carry Equal Marks
 marks

2*5=10

1	Draw and explain the functional block diagram of Dual Trace CRO.	(5)	C315.3	(Comprehension)
2.	Define Strain gauge & Explain about Bonded Resistance Wire Strain Gauges	(5)	C315.4	(Knowledge)
3	Describe the principle & Construction of LVDT and its applications	(5)	C315.4	(Comprehension)
4	Classify the types of bridges and derive the expression for Kelvin bridge?	(5)	C315.5	(Evaluation)



Sri Indu Institute of Engineering & Technology

Shereguda (V), Ibrahimpatnam (M), R.R.Dist-501 510

B-Tech I - Mid Examinations, NOV -2022

Objective Type Exam

Year & Branch: III –ECE-A, B&C

Date: -14-11-2022(FN)

Subject: EMI

Max. Marks: 10

Time: 20 mins

Name:Roll No.....

Choose the correct answers.

1. Range of voltmeters can be extended by. []
a) Multipliers b) Shunts c) Diodes d) RTD
2. Spectrum analyzers works on []
a) Time Domain b) Frequency Domain c) Amplitude d) none of the above
3. The error which is repetitive in nature is []
a) Observation error b) environmental error c) random error d) Systematic error
4. Which of the following element acts as a signal conditioning element []
a) Amplifier b) Modulator c) Filter d) All of the above
5. The ratio of change in output to the change in input is termed as []
a) linearity b) Sensitivity c) Hysteresis d) Threshold
6. A standard signal generator generates sin wave in the range of []
a) AF b) RF c) AF&RF d) none of these
7. Heterodyne means _____ of two signals []
a) Multiplying b) Subtracting c) Mixing d) Dividing
8. A D'arsonval movement is []
a) Taut Band b) PMMC c) Electro dynamo meter d) Moving iron type
9. Audio frequency range is []
a) 20HZ-20KHZ b) 20KHZ-40GHZ c) above 40GHZ d) none
10. Shape of Lissajous figure does not depends on []
a) Amplitude b) Phase Difference
c) Ratio of frequency of two waves d) none of these

II. Fill in the Blanks

11. The quantity to be measured is called_____.
12. The delay in the output of measuring system is _____.
13. Duty cycle of a square wave generator is _____.
14. The function of shunt in an ammeter is to _____.
15. The operating frequency range of a wave analyzer is_____.
16. The measuring range of voltmeter can be extended by using _____.
17. Define CRT_____.
18. _____is an instrument which provides several different output wave forms.
19. The difference between true value and measured value is _____.
20. Most of the A.C Voltmeters are _____type.
21. The ratio of R.M.S value to the Average value of A.C signal is called_____.

- 9) The chopping frequency of dual trace oscilloscope is []
a. 100MH b. 100KH c. 10Kh d. 10MH
- 10) Which of the following transducers are used to measure temperature []
a) Thermocouple b) RTD c) Hot wire Anemometer d) all

II. Fill In The Blanks:

11. The waveform which is responsible for the movement of spot on screen horizontally is called _____
12. The basic bridge consist of _____ arms.
13. The CRO gives visual representation of _____
14. The circuit is used to delay the signal for sometime in vertical section or channel of CRO is _____
15. Kevin bridges is used to measure the _____ .
16. Maxwell's bridge is used to measure _____.
17. Thermistors have _____ type of temperature coefficient.
18. RTD means _____
19. If the semiconductors are used to transduce the temperature then it is called _____
20. Synchros are used for measurement of _____

Sri Indu Institute of Engineering & Technology

Sheriguda (V), Ibrahimpatnam (M), R.R.Dist-501 510

B-Tech I - Mid Examinations, NOV-2022

Year & Branch: III -ECE-A, B&C

Date: 14-11-2022(FN)

Subject: EMI

ANSWER KEY

Descriptive paper key link:

https://drive.google.com/file/d/11hnK3DrSgA8TK_n8n53f3K7rB7x6zkkE/view?usp=sharing

g

Objective Key Paper

I. Choose the correct answers:

1. a
2. b
3. d
4. d
5. b
6. c
7. c
8. b
9. a
10. a

II. Fill in the Blanks

1. Measurand
2. Lag
3. 50%
4. Bypass current
5. 20Hz- 20KH
6. Series resistors
7. Cathode Ray Tube
8. Signal generator
9. Error
10. Form factor

Sri Indu Institute of Engineering & Technology

Sheriguda (V), Ibrahimpatnam (M), R.R.Dist-501 510

B-Tech II - Mid Examinations, JAN-2023

Year & Branch: III -ECE-A, B&C

Date: 21/01/23 (FN)

Subject: CS

ANSWER KEY

Descriptive paper key link:

<https://drive.google.com/file/d/1WcBmVbIjxmD5WcVGcx-GtV6O3F06F-jo/view?usp=sharing>

Objective/Quiz Key Paper

I. Choose The Correct Alternative:

1. d
2. d
3. c
4. a
5. c
6. d
7. a
8. a
9. b
10. b

II. Fill In The Blanks:

11. Time base generator or sweep generator
12. 4
13. Time varying signals
14. Vertical amplifier
15. Resistance
16. Inductance
17. $-V_e$
18. Resistance Temperature Detector

19. Thermister

20. Angle of rotation in machine



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Website: <https://siiet.ac.in/>

ASSIGNMENT- 1 SUBJECT: ELECTRONIC MEASUREMENTS & INSTRUMENTATION

1	Draw and explain Basic meter movement.	C315.1	(Application)
2	Draw and explain CRO	C315.3	(Application)
3	Define Basic wave analyzer	C315.2	(Knowledge)
4	State and explain shunt type ohmmeter.	C315.1	(Knowledge)
5	Draw and explain the PMMC construction and operation by using D'Arsonval Movement	C315.1	(Application)
6	Explain the performance characteristics of measuring instruments	C315.1	(Comprehension)
7	State and explain series type ohmmeter	C315.1	(Knowledge)



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ASSIGNMENT- 2 SUBJECT: ELECTRONIC MEASUREMENTS & INSTRUMENTATION

1	Draw and explain the functional block diagram of CRT	C315.3	(Knowledge)
2	Define Strain gauge & Explain about Bonded Resistance Wire Strain Gauges	C315.4	(Knowledge)
3	Explain the operating principle & Construction of LVDT and its applications	C315.4	(Comprehension)
4	Classify the types of bridges and derive the expression for Kelvin bridge?	C315.5	(Application)
5	Draw and Explain the functional block diagram of CRO.	C315.3	(Knowledge)
6	State and Explain in brief about Digital data acquisition system	C315.5	(Knowledge)
7	Classify the types of bridges and derive the expression for Maxwell's Inductance bridge?	C315.5	(Application)



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Website: <https://siiet.ac.in/>

Course Title	: ELECTRONIC MEASUREMENTS & INSTRUMENTATION
Course Code	EC513PE
Programme	B.Tech
Year & Semester	III year I-semester, A sec
Regulation	R18
Course Faculty	M GANESH, Assistant Professor, ECE

Slow learners:

S No	Roll no	No of backlogs	Internal-I Status	Internal-II Status
1	20X31A0401	4	18	19
2	20X31A0403	5	15	14
3	20X31A0406	4	16	15
4	20X31A0407	3	20	21
5	20X31A0408	3	15	16
6	20X31A0410	5	18	22
7	20X31A0411	4	23	18
8	20X31A0412	5	16	14
9	20X31A0413	4	15	19
10	20X31A0418	8	14	14
11	20X31A0419	4	19	20
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14	20X31A0428	4	21	22
15	20X31A0430	4	25	24
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17	20X31A0433	3	22	19
18	20X31A0435	3	19	19
19	20X31A0436	5	19	19

20	20X31A0440	4	23	22
22	20X31A0445	4	22	19
23	20X31A0447	3	23	23
24	20X31A0450	4	20	20
25	20X31A0453	4	20	21
26	20X31A0454	5	12	19
27	20X31A0455	4	17	22
28	20X31A0456	5	12	14
30	20X31A0458	3	18	22
31	20X31A0462	3	20	23

Advanced learners:

S.NO	ROLL.NO.	GATE MATERIAL
1	20X31A0404	Advanced concepts material is provided for advanced learners, subject seminars are presented by advanced learners in the class, and advanced learners are encouraged to support slow learners
2	20X31A0409	
3	20X31A0415	
4	20X31A0416	
5	20X31A0420	
6	20X31A0421	
7	20X31A0422	
8	20X31A0425	
9	20X31A0432	
10	20X31A0434	
11	20X31A0437	
12	20X31A0438	
13	20X31A0439	
14	20X31A0442	
15	20X31A0444	
16	20X31A0449	
17	20X31A0452	
18	20X31A0459	
19	20X31A0460	



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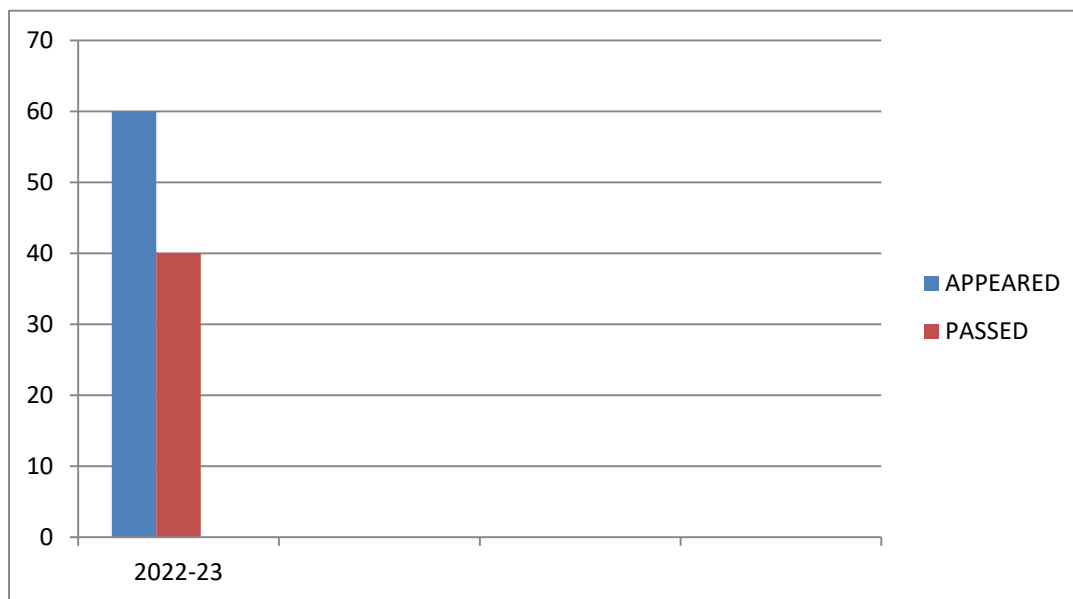
Khalsa Ibrahimpatnam, Sheriguda (V), Ibrahimpatnam (M), Ranga Reddy Dist., Telangana – 501 510

Website: <https://siiet.ac.in/>

BATCH ECE-III BTECH I SEM ECE-A RESULT ANALYSIS

ACADAMIC YEAR	COURSE NAME	NUMBER OF STUDENTS		QUESTION PAPER SETTING		PASS%
		APPEARED	PASSED	INTERNAL	EXTERNAL	
2022-23	ELECTRONIC MEASUREMENTS & INSTRUMENTATION	60	40	COURSE FACULTY	JNTUH	66.66

CONTROL SYSTEM (C313) RESULT ANALYSIS





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DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

REMEDIAL CLASSES TIME TABLE

A.Y 2022-23

SEMESTER-I

BRANCH/ SEC	MON 4.00 PM- 5.00 PM	TUE 4.00 PM-5.00 PM	WED 4.00 PM- 5.00 PM	THUR 4.00 PM- 5.00 PM	FRI 4.00 PM- 5.00 PM
II ECE-A	EDC	NATL	DSD	PTSP	SS
II ECE-B	NATL	DSD	PTSP	SS	EDC
III ECE-A	MPMC	DCCN	CS	BEFA	EMI
III ECE-B	DCCN	CS	BEFA	EMI	MPMC
III ECE-C	CS	BEFA	EMI	MPMC	DCCN
IV ECE-A	MW&OC	DIP	PPL	NS&C	JAVA
IV ECE-B	DIP	PPL	NS&C	JAVA	MW&OC
IV ECE-C	PPL	NS&C	JAVA	MW&OC	DIP


HOD Department
Electronics and Communication Engg. Dept.
SRI INDU INSTITUTE OF ENGG & TECH,
Sheriguda(V), Ibrahimpatnam(M), R.R.Dist-501 510


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

41	20X31A0441					4		3		8	5
42	20X31A0442			5		5				8	5
43	20X31A0444					5		5		8	5
44	20X31A0445					5		4		8	5
45	20X31A0446					5		5		8	5
46	20X31A0447					5		5		8	5
47	20X31A0448					4		5		8	5
48	20X31A0449			5		5				8	5
49	20X31A0450					3		5		7	5
50	20X31A0451	4				5				8	5
51	20X31A0452			5		4		5		8	5
52	20X31A0453					4		3		8	5
53	20X31A0454					2				7	5
54	20X31A0455					4				8	5
55	20X31A0456					3				7	5
56	20X31A0458					3		4		6	5
57	20X31A0459			5		4		5		8	5
58	20X31A0460					4		5		8	5
59	20X31A0461			5		5				8	5
60	20X31A0462					3		4		8	5
Target set by the faculty / HoD		3.00	0.00	3.00	0.00	3.00	0.00	3.00	0.00	6.00	3.00
Number of students performed above the target		14	0	10	0	45	0	39	0	57	59
Number of students attempted		14	0	11	0	51	0	40	0	59	59
Percentage of students scored more than target		100%		91%		88%		98%		97%	100%

CO Mapping with Exam Questions:

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

% Students Scored >Target %	100%		91%		88%		98%		97%	100%
-----------------------------	------	--	-----	--	-----	--	-----	--	-----	------

CO Attainment based on Exam Questions:

CO - 1	100%						98%		97%	100%
CO - 2						88%			97%	100%
CO - 3			91%						97%	100%
CO - 4										
CO - 5										
CO - 6										

CO	Subj	obj	Asgn	Overall	Level	Attainment Level
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CO-1	99%	97%	100%	98%	3.00
CO-2	88%	97%	100%	95%	3.00
CO-3	91%	97%	100%	96%	3.00
CO-4					
CO-5					
CO-6					

1	40%
2	50%
3	60%

Attainment (Internal 1 Examination) = **3.00**

RI INDU INSTITUTE OF ENGINEERING AND TECHNOLOGY



Department of Electronics and Communication Engineering Course Outcome Attainment (Internal Examination-2)

Name of the faculty Ganesh Muluka

Academic Year: 2022-20223

Branch & Section: ECE - A

Examination: II Internal

Course Name: EMI

Year: III

Semester: I

S.No	HT No.	Q1a	Q1b	Q2a	Q2b	Q3a	Q3b	Q4a	Q4b	Obj4	A4
Max. Marks ==>		5		5		5		5		10	5
1	20X31A0401			5						9	5
2	20X31A0402			5		5				9	5
3	20X31A0403					4				5	5
4	20X31A0404			5				5		8	5
5	20X31A0405	5						4		9	5
6	20X31A0406	1		2						7	5
7	20X31A0407			4		4				8	5
8	20X31A0408			2						9	5
9	20X31A0409	5				5				9	5
10	20X31A0410			4		5				8	5
11	20X31A0411	5								8	5
12	20X31A0412	1								8	5
13	20X31A0413			3		5				6	5
14	20X31A0414			5		5				7	5
15	20X31A0415	5		5						9	5
16	20X31A0416	2		4						8	5
17	20X31A0417	5		4		5				8	5
18	20X31A0418					4				5	5
19	20X31A0419			3		4				8	5
20	20X31A0420			1		4				7	5
21	20X31A0421							5		10	5
22	20X31A0422	3		5				5		10	5
23	20X31A0423			3				5		9	5
24	20X31A0424	3		5						9	5
25	20X31A0425	4		5						9	5
26	20X31A0426					4				5	5
27	20X31A0427	2				4				8	5
28	20X31A0428			5		4				8	5
29	20X31A0429	4						5		9	5
30	20X31A0430	5		5						9	5
31	20X31A0431	5								9	5
32	20X31A0432	5						5		9	5
33	20X31A0433			5						9	5
34	20X31A0434			5		5				9	5
35	20X31A0435			5						9	5
36	20X31A0436			5						9	5
37	20X31A0437					5		5		8	5
38	20X31A0438			5		5				9	5
39	20X31A0439	3		5		5				9	5
40	20X31A0440			5		5				7	5
41	20X31A0441	4						5		8	5
42	20X31A0442			5		5		5		9	5
43	20X31A0444			5		4				8	5
44	20X31A0445			4		3				7	5

45	20X31A0446			5		4				9	5
46	20X31A0447	5				5		5		8	5
47	20X31A0448			4		4				9	5
48	20X31A0449	5				5		5		9	5
49	20X31A0450	2						5		8	5
50	20X31A0451	5						5		8	5
51	20X31A0452			5		5		5		8	5
52	20X31A0453			5		4				7	5
53	20X31A0454			4		2				8	5
54	20X31A0455			5		4				8	5
55	20X31A0456					2				7	5
56	20X31A0458			4		5				8	5
57	20X31A0459					5		5		8	5
58	20X31A0460					5		5		9	5
59	20X31A0461			5		3		5		9	5
60	20X31A0462			5				5		8	5
Target set by the faculty / HoD		3.00	0.00	3.00	0.00	3.00	0.00	3.00	0.00	5.40	3.00
Number of students performed above the target		17	0	35	0	33	0	18	0	55	59
Number of students attempted		22	0	38	0	35	0	18	0	58	59
Percentage of students scored more than target		77%		92%		94%		100%		95%	100%

CO Mapping with Exam Questions:

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

% Students Scored >Target %	77%		92%		94%		100%		95%	100%
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CO Attainment based on Exam Questions:

CO - 1											
CO - 2											
CO - 3	77%									95%	100%
CO - 4			92%							95%	100%
CO - 5					94%					95%	100%
CO - 6							100%			95%	100%

CO	Subj	obj	Asgn	Overall	Level
CO-1					
CO-2					
CO-3	77%	95%	100%	91%	3.00

Attainment Level	
1	40%
2	50%
3	60%

CO-4	92%	95%	100%	96%	3.00
CO-5	94%	95%	100%	96%	3.00
CO-6	100%	95%	100%	98%	3.00

Attainment (Internal Examination- **3.00**



J. J. INDU INSTITUTE OF ENGINEERING AND TECHNOLOGY

Department of Electronics and Communication Engineering

Course Outcome Attainment (University Examinations)

Name of the faculty : Ganesh Muluka

Academic Year:

2022-20223

Branch & Section: ECE - A

Year / Semester:

III / I

Course Name: EMI

S.No	Roll Number	Marks Secured
1	20X31A0401	41
2	20X31A0402	13
3	20X31A0403	AB
4	20X31A0404	45
5	20X31A0405	26
6	20X31A0406	2
7	20X31A0407	32
8	20X31A0408	6
9	20X31A0409	39
10	20X31A0410	2
11	20X31A0411	26
12	20X31A0412	4
13	20X31A0413	11
14	20X31A0414	34
15	20X31A0415	31
16	20X31A0416	6
17	20X31A0417	37
18	20X31A0418	AB
19	20X31A0419	26
20	20X31A0420	19
21	20X31A0421	33
22	20X31A0422	46
23	20X31A0423	19
24	20X31A0424	13
25	20X31A0425	33
26	20X31A0426	26
27	20X31A0427	4
28	20X31A0428	27
29	20X31A0429	26
30	20X31A0430	14
31	20X31A0431	14
32	20X31A0432	26
33	20X31A0433	26
34	20X31A0434	32
35	20X31A0435	18

S.No	Roll Number	Marks Secured
36	20X31A0436	12
37	20X31A0437	33
38	20X31A0438	28
39	20X31A0439	34
40	20X31A0440	27
41	20X31A0441	30
42	20X31A0442	36
43	20X31A0444	27
44	20X31A0445	4
45	20X31A0446	26
46	20X31A0447	29
47	20X31A0448	12
48	20X31A0449	40
49	20X31A0450	7
50	20X31A0451	39
51	20X31A0452	42
52	20X31A0453	29
53	20X31A0454	1
54	20X31A0455	2
55	20X31A0456	AB
56	20X31A0458	27
57	20X31A0459	46
58	20X31A0460	28
59	20X31A0461	33
60	20X31A0462	29
61		
62		
63		
64		
65		
66		
67		
68		
69		
70		

Max Marks	75
Class Average mark	24
Number of students performed above the	37
Number of successful students	60

Attainment Level	% students
1	40%
2	50%

Percentage of students scored more than	62%
Attainment level	3

3	60%
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SRI INDU INSTITUTE OF ENGINEERING AND TECHNOLOGY

Department of Electronics and Communication Engineering

Course Outcome Attainment

Name of the faculty Ganesh Muluka

Academic Year 2022-20223

Branch & Section: ECE - A

Examination: I Internal

Course Name: EMI

Year: III

Semester: I

Course Outcomes	1st Internal Exam	2nd Internal Exam	Internal Exam	University Exam	Attainment Level
CO1	3.00		3.00	3.00	3.00
CO2	3.00		3.00	3.00	3.00
CO3	3.00	3.00	3.00	3.00	3.00
CO4		3.00	3.00	3.00	3.00
CO5		3.00	3.00	3.00	3.00
CO6		3.00	3.00	3.00	3.00
Internal & University Attainment:			3.00	3.00	
Weightage			25%	75%	
CO Attainment for the course (Internal, University			0.75	2.25	
CO Attainment for the course (Direct Method)			3.00		

Overall course attainment level

3.00



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

Website: <https://siiet.ac.in/>

ASSIGNMENTS AND REGISTERS

Assignment 1 script link:

<https://drive.google.com/file/d/1HbItJWF3S11xfEzOWvtIlii71iflc8IX/view?usp=sharing>

Assignment 2 script link:

https://drive.google.com/file/d/1BqFoU_c1_GhVa1x3AN1CSzKAqs5EqCLO/view?usp=sharing

Attendance register link:

<https://drive.google.com/file/d/1BjgaT4qqWlCioahR6hnhHSuTktMeobBj/view?usp=sharing>