

Government of Karnataka
Department of Technical Education

C-25 Diploma in Electronics Instrumentation & Control Engineering.

Scheme of Studies

(Effect from the AY 2025-26)

Government of Karnataka

DEPARTMENT OF TECHNICAL EDUCATION

Curriculum Structure

I Semester Scheme of Studies-Electronics Instrumentation & Control Engineering

Sl. No.	Teaching Department	Course Code	Course Name	Hours per week			Total Contact Hours/week	Credits	CIE Marks		Theory SEE Marks		Practice SEE Marks		Total Marks
				L	T	P			Max	Min	Max	Min	Max	Min	
Integrated Courses															
1	SC	25SC11I	Engineering Mathematics-I	4	0	4	8	6	50	20	50	20	-	-	100
2	CS	25CS01I	IT Skills	3	0	4	7	5	50	20	-	-	50	20	100
3	ENG	25EG01I	Essential English Communication	4	0	4	8	6	50	20	-	-	50	20	100
4	EI	25EI11I	Basics of Electronics & Instrumentation	4	0	4	8	6	50	20	50	20	-	-	100
Audit Course															
5	EI	25EI12T	Environmental Sustainability	2	0	0	2	2	50	20	-	-	-	-	50
6	Personality Development		NCC/NSS/YOGA/SPORTS...	Students are expected to engage in any one of these activities from 1st semester to 6thsemester (No Credits)											
			Total	**17**	**0**	**16**	**33**	**25**	**250**	**-**	**100**	**-**	**100**	**-**	**450**

Government of Karnataka
DEPARTMENT OF TECHNICAL EDUCATION

Program	**Electronic Instrumentation and Control Engineering**	**Semester**	**I**
Course Name	**Basics of Electronics & Instrumentation**	**Type of Course**	Integrated
Course Code	**25EI11I**	**Contact Hours**	**8hours/week (104hours/semester)**
Teaching Scheme	L: T:P-4:0:4	**Credits**	6
CIE Marks	50	**SEE Marks**	**50 (Theory)**

1. Rationale:

Semiconductor devices and Digital electronics are the backbone of modern technology. Everything from computers to smart phones to medical equipment relies on semiconductor devices and digital circuits. Understanding these concepts is essential for anyone pursuing a career in technology or engineering. Digital electronics focuses on the design and analysis of digital circuits that process binary data.

Semiconductor devices such as diodes, transistors, and integrated circuits are the building blocks of electronic devices. By studying these components, engineers learn how to design and manufacture complex integrated circuits that power a wide range of electronic systems.

Overall, studying semiconductor and digital electronics devices provides a solid foundation for understanding and working with modern electronic systems, enabling engineers to design, analyse, and optimize a wide range of electronic devices and circuits.

The Electronic Instrumentation Engineering field deals with the creation, building and maintenance of measuring and control devices and systems found in manufacturing plants and research institutions.

2. Course Outcomes: At the end of the Course, the students will be able to:

CO-01	Explain the Construction, Working principle and Characteristics of various semiconductor Devices.
CO-02	Build applications of Diodes and Transistors.
CO-03	Illustrate the building blocks of an Instrumentation system.

3. Course Content

WEEK	CO	PO	Theory	Practice
1	**1**	**1,4**	**Introduction to semiconductors** 1.Definition of Current, Potential, Potential Difference, Resistance 2. Insulator, Semiconductor, Conductor- Energy level diagram. 3. Types/Classification of semiconductor-	1. Familiarization of Multi Meter, Ammeter and Voltmeter, Active &Passive Components 2.Soldering&Desoldering Practice.

			• Intrinsic • Extrinsic –P type and N type. 4. Conduction in P type and N type Semiconductor.	
2	**1**	**1,4**	**Basics of Semiconductor Devices.** 1. PN Junction Diode: Formation of PN Junction diode. 2. Biasing-Forward and Reverse Bias. 3. V-I Characteristics of Junction diode. 4.Application of diode (list)	1. Demonstration of electronic Equipment's. (Power supply and CRO) 2.Plot V-I characteristics of Junction diode in forward bias.
3	**1**	**1,4**	1. Working principle of Zener diode 2.V-I Characteristics of Zener diode 3. Zener diode(Regulator) 4.Reverse break down **4.** Avalanche breakdown **5.** Zener break down	1. Plot V-I characteristics of Zener diode in Reverse bias.
4	**1,2**	**1,2,4**	**Rectifiers:** 1. Definition, Types, Need of rectification 2. Half wave rectifier. 3. Bridge rectifier 4. Advantages & Disadvantages	1. Half wave rectifier without filter 2. Full wave rectifier without filter Using bridge module
5	**1,2**	**1,2,4**	1. Ripple factor-Half wave and Full-wave rectifier 2. Filter- Definition, Types, working of C filter 3. Efficiency- Definition, % efficiency in HWR and FWR 4. Comparison-HWR and FWR	1. Half wave rectifier with C filter
6	**1**	**1,4**	**Bipolar Junction Transistors** 1. Definition, Types, Formation of NPN transistor. 2. Formation of PNP Transistor 3. Working of NPN Transistor 4. Working of PNP Transistor.	1.Plot input characteristics of BJT in CE Configuration.
7	**1**	**1,4**	1. Modes of operation-CB, CE, CC. 2.Input and output characteristics of transistor in CE Configuration. 3. Operating Region of BJT-Active, Saturation, Breakdown) 4. Current Amplification factor α and β,	1. Plot Output characteristics of BJT in CE configuration.
8	**1,2**	**1,3,4**	1. Relationship between α and β. 2. Comparison between CE CB CC Configuration. 3. Application of transistor as a Switch. 4. Application of transistor as an amplifier	1.Demonstrate the operation of BJT as a Switch.
9	**1**	**1,4**	**Field Effect Transistors (FET)** 1. Definition, Types	1.Plot the drain characteristics of N channel JFET

			Working of N – Channel JFET. 2. Comparison between BJT and FET. 3. Parameters of JFET- Definition and relation, 4. Drain and transfer characteristics of JEFT. Definition, Types, symbol of MOSFET	2.Plot the transfer characteristics of N channel JFET.
10	**1**	**1,4**	1. Definition, Symbol, Construction. 2. Working Principle of UJT. 3. V-I Characteristics of UJT 4. Applications of UJT	1.Conduct an experiment and Plot V-I characteristics of UJT.
11	**1**	**1,4**	Opto-electronic devices: 1. Introduction principle of photo emission, photoconduction and photovoltaic effects. 2. Photodiode-Construction and working principle. 3. Phototransistor-Construction and working principle. 4. V-I characteristic of Photo diode and Photo transistor	1.Plot V-I Characteristics of Photodiode.
12	**3**	**1,4**	**Introduction to Instrumentation System** 1.Instrumentation System Definition, importance of Instrumentation System Measurement - Definition, Need, 2.Block diagram of generalized measurement system. 3.Basic Characteristics of measurement System - Accuracy, Precision, Resolution, Linearity, Hysteresis, Calibration, Reliability and Span 4. Error-Definition Types	1. Prepare report on any one Instrumentation system. Ex: Temperature measurement System.
13	**3**	**1,4**	1.Transducer – Definition, types Active, Passive, 2. Electrical &Mechanical, advantages of Electrical transducer 3.Basic requirements of Transducer 4.List Applications of Transducer	Video Demonstration on applications of different Transducers
Total Hours			52 Hours	52 Hours

4. References:

Sl.No	Description
1	Digital Principles & Applications - Malvino & Leach
2	Principles of Digital Electronics- by Floyd
3	Electronic Devices & Circuits – Millman & Halkias
4	Principles of Electronics, Rohit Mehta and V K Mehta, S.Chand and Company Publishing
5	Fundamentals of Electrical Engg. & Electronics, B L Theraja , S. Chand

6	Digital Electronics Devices Principles & Applications -A.K. Maini (Willey Eastern Publications)
7	Principles of Electronics ,V.K. Mehta
8	Instrumentation devices and systems –Rangan , Mani and sharma
9	Electronic Devices and Circuits, David A. Bell, Oxford University Press, I SBN 9780195693409
10	Electrical &Electronic Measurements and Instrumentation: R K Rajput
11	Electronic Instrumentation and Measurements: David Bell

E-references:

Sl.No	Description
1	**http://www.allaboutcircuits.com**
2	**http://www.allaboutcircuits.com/videos**
3	**www.daenotes.com**
5	**www.talkingelectronics.com/**
6	**www.electronics-tutorials.ws**

5. CIE Assessment Methodologies

Sl. No	CIE Assessment	Test Week	Duration (minutes)	Max marks	
1.	CIE-1Theory Test	4	90	50	Average of all CIE=50 Marks
2.	CIE-2 Practice Test	7	180	50	
3	CIE-3 Theory Test	10	90	50	
4.	CIE-4 Practice Test	13	180	50	
5	CIE-5 Portfolio evaluation of all the activities through Rubrics	1-13		50	
Total					**50 Marks**

Note: Portfolio evaluation may include suggested activity/model/presentation/simulation and record of Lab exercises.

6. SEE - Theory Assessment Methodologies

Sl. No	SEE – Theory Assessment	Duration	Exam Paper Max marks	Exam Paper Max Marks scale down to (Conversion)	Min marks to pass
1.	Semester End Examination-Theory	3 Hours	100	50	20

7. CIE Theory Test model question paper

Program	Electronic Instrumentation and Control Engineering			Semester - I	
Course Name	Basics of Electronics & Instrumentation			Test	I/III
Course Code	25EI11I	Duration	90 min	Marks	50
Name of the Course Coordinator:					
Note: Answer **any one full question** from each section. Each full question carries equal marks.					

Q. No	Questions	Cognitive Level	Course Outcome	Marks
	Section - 1			
1	a) Define semiconductor and list the types. b) Explain forward and reverse Biasing of a Diode. c) Explain the formation of P-N Junction diode with neat Figure	R U U	1	5M 10M 10M
2	a) Define P-N junction and write the symbol. b) Explain Intrinsic and Extrinsic semiconductor. c) Explain the V-I characteristic of diode with ideal graph.	R U U	1	5M 10M 10M
	Section - 2			
3	a) Define Rectifier? List types. b) Explain the working of Bridge Full wave rectifier. c)Explain the energy band diagram of conductors, insulators and semiconductors.	R U U	1	5M 10M 10 M
4	a) Define Zener diode? List the properties. b) Explain the working of Half wave rectifier with	R U	1	5M 10M

	filter. c) Explain the formation of P-type semiconductor.	U		10M

Note for the Course coordinator: Each question may have one, two or three subdivisions. Optional questions in each section carry the same weightage of marks, cognitive level and course outcomes.

Signature of the Course Coordinator **Signature of the HOD** **Signature of the IQAC Chairman**

8. CIE Practice Test model question paper

Program	**Electronic Instrumentation and Control Engineering**			**Semester**	**Ist**
Course Name	**Basics of Electronics & Instrumentation**			**Test**	**II/IV**
Course Code	**25EI11I**	**Duration**	**180 min**	**Marks**	**50**
Name of the Course Coordinator:					
Questions				**CO**	**Marks**
Conduct an experiment to 1. Plot V-I characteristics of junction diode in forward bias. 2. Plot V-I characteristics of Zener diode in Reverse bias. 3. Half wave rectifier without filter. 4. Full wave rectifier without filter. 5. Half wave rectifier with C filter. 6. Plot input characteristics of BJT in CE Configuration. 7. Plot output characteristics of BJT in CE Configuration. 8. Demonstrate the operation of BJT as a Switch.				**1,2**	**50**
Scheme of assessment **1.** Draw circuit/ Tabular column/ Ideal graph, calculation etc . **2.** Construction & Conduction **3.** Result **4.** Viva-Voce					 10 20 10 10
Total Marks					**50**

Note: The List is an Example and not Inclusive of all possible of the course.
Course coordinator can choose questions that are relevant to the topic.

Signature of the Course Coordinator **Signature of the program coordinator**

9. Suggestive Activities for Tutorials:

The List is an Example and not inclusive of all possible activities of the course. Student and Faculty are encouraged to choose activities that are relevant to the topic

Sl. No.	Suggestive Activities for Tutorials
01	Prepare a report on applications of Diode
02	Solve problems to calculate Ripple factor and Efficiency of HWR and FWR.
03	Solve problems to Calculate Alpha and beta of a transistor
04	Prepare a report on various types of Transducers & their applications

Note: Students can carry out any two activity for Evaluation.

10. Rubrics for Assessment of Activity(Qualitative Assessment)

Sl. No.	Dimension	Beginner	Intermediate	Good	Advanced	Expert	Students Score
		0-10	11-20	21-30	31-40	41-50	
1	Application of Knowledge	Limited understanding and weak application.	Basic understanding with some incorrect use.	Good application, lacks depth in some areas.	Solid understanding with minor gaps.	Mastery of concepts applied perfectly.	40
2	Problem Solving & Innovation	Minimal problem-solving or ineffective solutions.	Struggles with solving problems effectively.	Basic solutions with little creativity.	Good problem-solving with some creativity.	Creative and effective solutions.	30
3	Collaboration & Teamwork	Poor teamwork, minimal participation	Limited teamwork, poor communication	Adequate teamwork, some uneven participation.	Good collaboration, with minor participation issues.	Excellent teamwork, clear communication	40
4	Presentation & Communication	Poor presentation, unclear and weak visuals.	Basic presentation, unclear or poorly structured.	Good presentation with minor clarity issues.	Clear and organized, solid visuals	Clear, engaging, and well-structured.	30
	Average Marks=(40+30+40+30)/4 = 35						**35**

Note: It is just a sample copy. Dimension and Descriptors hall be defined by the respective course co-ordinator as per the activities

11. Equipment/software list with Specification for a batch of 30 students

Sl.No.	Particulars	Specification	Quantity
01	DC Regulated power supply	(0-30V, 2A)	5
02	LCR Meter		1
03	Cathode Ray Oscilloscope	Dual trace 30MHz	5
04	Digital Multimeter		5

05	Analog Multimeter		5

Government of Karnataka
DEPARTMENTOFTECHNICALEDUCATION

Curriculum Structure

II Semester Scheme of Studies-Electronics Instrumentation & Control Engineering

Sl. No.	Teaching Department	Course Code	Course Name	Hours per week			Total Contact Hours/week	Credits	CIE Marks		Theory SEE Marks		Practice SEE Marks		Total Marks
				L	T	P			Max					Min	
Integrated Courses															
1	SC	25SC21I	Engineering Mathematics-II	4	0	4	8	6	50	20	50	20	-	-	100
2	EE/EC	25EE01I	Fundamentals of Electrical & Electronics Engineering.	3	0	4	7	5	50	20	-	-	50	20	100
3	ME	25ME02I	Computer Aided Engineering Graphics	3	0	4	7	5	50	20	-	-	50	20	100
4	EI	25EI21I	Fundamentals of Digital Electronics	4	0	4	8	6	50	20	50	20	-	-	100
Audit Course															
5	EI	25EI22T	Indian Constitution	2	0	0	2	2	50	20	-	-	-	-	50
6	Personality Development		NCC/NSS/YOGA/SPORTS...	Students are expected to engage in any one of these activities from 1st semester to 6th semester (No Credits)											
			Total	**16**	**0**	**16**	**32**	**24**	**250**	**-**	**100**	**-**	**100**	**-**	**450**

Government of Karnataka
DEPARTMENT OF TECHNICAL EDUCATION

Program	**Electronic Instrumentation and Control Engineering**	**Semester**	**II**
Course Name	**Fundamentals of Digital Electronics**	**Type of Course**	**Lecturing (Theory and activity/practice)**
Course Code	**25EI21I**	**Contact Hours**	8 hours/week 104hours/semester)
Teaching Scheme	L: T:P-4:0:4	**Credits**	6
CIE Marks	50	**SEE Marks**	50**(Theory)**

1. **Rationale:**

Digital electronics is a critical area of electrical and electronics engineering, forming the core of most modern electronic devices and systems. It encompasses the study and application of digital circuits, which utilize discrete signal levels to represent information. Logic design is a key aspect of this field, focusing on the creation and optimization of digital circuits for various practical applications. Mastering these concepts is essential for careers in computing, telecommunications, automation, and consumer electronics, where digital electronics and logic design play a pivotal role in the development of innovative technologies and solutions.

2.Course Outcomes: At the end of the Course, the student will be able to:

CO-01	Apply arithmetic and conversion operations on different number systems.
CO-02	Outline the features of logic gates, simplify & implement simple logic functions
CO-03	Build/design and analyze various combinational circuits.
CO-04	Outline the Advantages, Disadvantages &Applications of Integrated circuits

3.Course Content

WEEK	**CO**	**PO**	**Theory (4 Hours per week)**	**Practice (4 Hours per week)**
1	1	1,4	NUMBER SYSTEMS AND CODES 1. Comparison between analog and digital signals with real-world examples. Number systems: Binary, Octal, Decimal and Hexadecimal. Relevance and examples.	1.Familiarization of IC Manual &IC tester, 2. Familiarization of IC Trainer

			2. Conversion between Binary to Other. number systems 3. Conversion between Another no system to Binary number systems 4. Conversion between any other number systems with examples	
2	**1**	**1,2,4**	1. Arithmetic operations – Addition & Subtraction 2. Multiplication and Division on binary numbers with example 3. Subtraction of Binary number using 1's & 2's complement method with examples 4. Codes: Relevance, types (BCD, Gray, Excess3, ASCII with examples	1. Problem-solving on Arithmetic operations 2. Practice problems on Code conversions
3	**2**	**1,4**	**BASIC LOGIC CIRCUITS** 1. Boolean algebra: Constants, variables, functions, 2. Boolean identities and laws with proof and examples. 3. Logic-gates -NOT, OR, AND Symbol, expression and truth table. 4. NOR, NAND, EX-OR: Symbol, expression and truth-table.	1. Verify the truth table Of AND, OR ,NOT & NAND gates 2. Verify the truth table of NOR &EX-OR gates
4	**2**	**1,2,4**	1. Realization of AND, OR &NOT, using only NAND gates 2. Realization of NOR, EX-OR using only NAND gates 3. Realization of AND, OR &NOT , using only NOR gates 4. Realization of NAND, EX-OR using only NOR gates	1. Implementation of AND, OR, NOT Using only NAND gates. 2.Implementation of AND, OR, NOT Using only NOR gates
5	**2**	**1,2,4**	1. De Morgan's Theorem-1 proof with examples. 2. De Morgan's Theorem-2 proof with examples. 3. Simplification of Boolean expressions using Boolean algebra 4. Build the logic circuit for the simplified expression	1. Verify Demorgan's I theorem. 2.Verify Demorgan's II theorem

6	**2**	**1,2,3, 4**	1. SOP and POS forms, Conversion in to standard SOP and POS form 2. Translate SOP and POS expressions into truth-table, Convert truth-table to SOP and POS expression (maximum 3 variables). 3. Karnaugh Map: Need, K-map for 2variable, 3 variable Boolean expression 4.Simplification of Boolean expression using K- map and realization of logic circuit for 2 and 3 variable.	3. Practice problems on conversion between SOP & POS
7	**3**	**1,2,3, 4**	**ARITHMETIC CIRCUITS** 1. Features of combinational circuits and examples. Half adder (HA):truth-table, logical expression, gate-level implementation and application. 2. Full adder (FA): truth-table, logical Expression, gate-level implementation and application. 3. Applications of Adders 4. Working of Serial &Parallel adder	1.Verify the truth table of Half adder using basic gates 2.Verify the TT of 4 bit parallel adder using IC 7483
8	**3**	**1,2,3, 4**	1. Half Subtractor (HS): Truth-table, logical expression, gate-level implementation 2. Full Subtractor (FS): Truth-table, logical expression, gate-level implementation 3. Applications of Subtractor 4. Working of 2-bit comparator	1. Verify the truth table of Half subtractor using basic gates
9	**3**	**1,2,3, 4**	1. Multiplexers (Mux): Concept, 2:1 Multiplexer - Truth-table, logic expression, gate-level implementation 2. Multiplexers (Mux): Concept, 4:1 Mux - Truth-table logic expression, gate-level Implementation 3.Realizing Higher order Mux from low order Mux.(4:1 using 2:1 Mux) 4. Applications of Mux	1. Verify the TT of 2:1 Mux using gates 2.Verify the truth table of 8:1 Multiplexer using IC 74151.

10	**3**	**1,2,3, 4**	1. Demultiplexer (Demux): Concept, 2. 1:2Demux - Truth-table, logical expression, gate-level implementation 3. 1:4 Demultiplexer - Truth-table, logical expression, gate-level implementation 4. Application of Demultiplexer	1. Verify the truth table of 1:8 Demultiplexer using IC 74138
11	**3**	**1,2,3, 4**	**ENCODERS AND DECODERS** 1. Encoders and Decoders: Concept 2. Decimal-to-BCD encoder: Logic diagram, working, truth-table and application. 3. Priority Encoder: Logic diagram, working and Truth Table. 4. Applications	1. Verify the truth table of priority encoder using IC 74147
12	**3**	**1,2,3, 4**	1. BCD-to-Decimal decoder: Logic diagram, working and truth-table 2. seven-segment display: Principle and types. 3. BCD-to-seven segment decoder: Logic diagram, working and truth table 4.Applications of Encoders & Decoders	1. Interface 7 segment display with IC 7446 decoder and Verify BCD to Decimal conversion
13	**4**	**1,4**	**Integrated circuit(IC)** 1. Introduction 2. Advantages of IC &Disadvantages & Applications of IC 3. Classification of IC 4. Logic Families – Types, Comparison between TTL& CMOS Logic families	1. Prepare a Report on Parameters of Logic families
Total hours			52Hrs	52Hrs

Note: The experiments can be carried out using open source software wherever possible

4. References:

1. Digital Principles & Applications – Malvino & Leach
2. Principles of Digital Electronics- by Floyd
3. Digital Electronics Devices Principles & Applications -A.K. Maini
4. Digital Electronics - By A. P. Godse
5. Digital Computer Fundamentals- Thomos C Bartee
6. Digital Electronics and Integrated Circuits- R P Jain & M M S Anand
7. Digital Systems- Ronald J.Tocci

5. CIE and SEE Assessment Methodologies

Sl. No	Assessment	Test Week	Duration (minutes)	Max marks	
1.	CIE-1Theory Test	4	90	50	Average of all CIE=50 Marks
2.	CIE-2 Practice Test	7	180	50	
3	CIE-3 Theory Test	10	90	50	
4.	CIE-4 Practice Test	13	180	50	
5	CIE-5 Portfolio evaluation of all the activities through Rubrics	1-13		50	
Total Continuous Internal Evaluation (CIE)					50 Marks
Semester End Examination (SEE)-Theory			90	50	50 marks
Total Marks					**100 Marks**
Minimum marks to pass in CIE & SEE is 40% individually					

Note: Portfolio evaluation may include suggested activity/Model/Report/Presentation/ Simulation and record of Lab exercises

6. SEE - Theory Assessment Methodologies

Sl. No	SEE – Theory Assessment	Duration	Exam Paper Max marks	Exam Paper Max Marks scale down to (Conversion)	Min marks to pass
1.	Semester End Examination-Theory	3 Hours	100	50	20

7. CIE Theory Test

Program	**Electronic Instrumentation and Control Engineering**			**Semester II**	
Course Name	**Fundamentals of Digital Electronics**			**Test**	**I/III**
Course Code	**25EI21I**	**Duration**	**90 min**	**Marks**	**50**
Name of the Course Coordinator:					
Note: Answer any one full question from each section. Each full question carries equal marks.					
Q. No	**Questions**		**Cognitive Level**	**Course Outcome**	**Marks**
Section - 1					

1	a) Compare Hexadecimal and Binary number systems b) Outline the features of ASCII code c) (i)Convert $_{(}$AB5)$_{16}$ to Binary equivalent (ii) Convert(1011100110)$_2$ by it's Octal equivalent. (iii) Convert (432)$_{10}$ to hexadecimal. d) (i)Explain the conversion of Binary to BCD with an example (ii) Multiply (10111)$_2$ x (101)$_2$	U	CO1	5 3 7(2+2+3) 5 5
2	a)Compare Analog & Digital Signals b) Outline the features of BCD number System. c)(i) Convert $_{(}$754)8 to Binary equivalent (ii) Add (10111)$_2$ + (11101)$_2$ (iii) Sub (10111)$_2$ from (11111)$_2$ using 2's complement method d)(i) Explain the conversion of Binary to BCD with an example (ii) Convert Decimal number 886 to Excess-3 code	U	CO1	5 3 7(2+2+3) 5 5
Section - 2				
3	a) State and prove Demorgan's theorem. b) Explain the working of all the basic gates with truth table and symbol c) Realize AND,OR,NOT, using only NAND gate			5 10 10
4	a)State & prove any 2 laws of Boolean algebra b)Explain the working of NOR, NAND & EX-OR with truth table and symbol c) Realize AND,OR,NOT using only NOR gate			5 10 10
Note for the Course coordinator: Each question may have one, two or three subdivisions. Optional questions in eachsectioncarrythesameweightageofmarks,cognitivelevelandcourseoutcomes.				

Signature of the Course Coordinator Signature of the HOD Signature of the IQAC Chairman

8. CIE Practice Test

Program	**Electronic Instrumentation & Control Engineering**			**Semester**	**II**
Course Name	**Fundamentals of Digital Electronics**			**Test**	**II/IV**
Course Code	**25EI21I**	**Duration**	**180 min**	**Marks**	**50**
Name of the Course Coordinator:					
Questions				**CO**	**Marks**
Conduct an experiment to 1. Verify the functioning of AND,OR & NOT gates 2. Realize AND,OR & NOT functions using only NAND gate 3. Interface 7 segment display with IC 7446 decoder and Verify BCD to Decimal conversion 4. Verify Demorgan's theorem 5. Demonstrate functioning of Half adder				**1,2,3,4**	**50**

Scheme of assessment Conduct an Experiment (any one) a) Writing Logic diagram, Truth Table, etc . b)Construction & Conduction c)Result d) Viva-Voce	 10 20 10 10
Total Marks	**50**

Note: The List is an Example and not inclusive of all possible experiments of the course. Course Coordinator can choose questions that are relevant to the topic

Signature of the Course Coordinator **Signature of the HOD**

9. **Suggestive Activities for Tutorials**:

The List is only shared as an Example and not inclusive of all possible activities of the course. Student and Faculty are encouraged to choose activities that are relevant to the topic and on the availability of such resources at their institution.

Sl.No.	Suggestive Activities
01	Realization of EX-NOR using only NAND gate
02	Realization of EX-NOR using only NOR gate
03	problems on conversion between SOP & POS
04	Demonstrate code conversion (BCD to Gray) using Gates
05	Demonstrate code conversion (Gray to BCD) using Gates
06	Implement Logic function using Multiplexer
07	Verify the TT of 2-bit Magnitude comparator

Note: Students can carry out any one activity for Evaluation

10. Rubrics for Assessment of Activity (Qualitative Assessment)

Sl. No.	Dimension	Beginner	Intermediate	Good	Advanced	Expert	Students Score
		0-10	11-20	21-30	31-40	41-50	
1	Application of Knowledge	Limited understanding and weak application.	Basic understanding with some incorrect use.	Good application, lacks depth in some areas.	Solid understanding with minor gaps.	Mastery of concepts applied perfectly.	40
2	Problem Solving & Innovation	Minimal problem-solving or ineffective solutions.	Struggles with solving problems effectively.	Basic solutions with little creativity.	Good problem-solving with some creativity.	Creative and effective solutions.	30
3	Collaboration & Teamwork	Poor teamwork, minimal participation	Limited teamwork, poor communication	Adequate teamwork, some uneven participation.	Good collaboration, with minor participation issues.	Excellent teamwork, clear communication	40
4	Presentation & Communication	Poor presentation, unclear and weak visuals.	Basic presentation, unclear or poorly structured.	Good presentation with minor clarity issues.	Clear and organized, solid visuals	Clear, engaging, and well-structured.	30
	Average Marks=(40+30+40+30)/4 = 35						**35**

Note: It is just a sample copy. Dimension and Descriptors hall be defined by the respective course co-ordinator as per the activities

11. Equipment/softwarelistwithSpecificationsforabatchof30students

Sl.No.	Particulars	Specification	Quantity
01	Digital IC Trainer Kits	+5V /LK +/- 12/50Ma Socket:4no's 16/20PIN ZJF Socket Bread Board	15
02	Digital IC Tester	Test a wide range of Digital IC's and Analog IC's ,Auto search facility of all digital IC's	02
03	Digital Multimeter		15