

**Department of Computer Science and Engineering (AIML)**

**Course File**

**ELECTRONIC DEVICES AND CIRCUITS**

**(Course Code: EC205ES)**

**I B.Tech II Semester**

**2023-24**

**Mrs.G.SHOBHA**  
**Assistant Professor**



## Department of ECE

**ELECTRONIC DEVICES AND CIRCUITS**

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(Highlighted parts has to be revised by individual faculty )

**Department of ECE****ELECTRONIC DEVICES AND CIRCUITS****Int. Marks:40    Ext. Marks:60    Total Marks:100****(Common to ECE, CSE, IT&AIML)****Course Code: EC205ES**

**UNIT –I:** Diodes: Diode - Static and Dynamic resistances, Equivalent circuit, Diffusion and Transition Capacitances, V-I Characteristics of Diode, Diode as a switch- switching times.

**UNIT –II:** Diode Applications: Rectifier - Half Wave Rectifier, Full Wave Rectifier, Bridge Rectifier, Rectifiers with Capacitive and Inductive Filters,

**Clippers and Clampers:** Clippers-Clipping at two independent levels, Clamper-Clamping Circuit Theorem, Clamping Operation, Types of Clampers.

**UNIT - III:** Bipolar Junction Transistor (BJT): Principle of Operation, Common Emitter, Common Base and Common Collector Configurations, Transistor as a switch, switching times.

**UNIT -IV:** Junction Field Effect Transistor (FET): Construction, Principle of Operation, Pinch-Off Voltage, Volt-Ampere Characteristic, Comparison of BJT and FET, FET as Voltage Variable Resistor, MOSFET, MOSTET as a capacitor.

**UNIT –V:** Special Purpose Devices: Zener Diode - Characteristics, Zener diode as Voltage Regulator, Principle of Operation - SCR, Tunnel diode, UJT, Varactor Diode, Photo diode, Solar cell, LED, Schottky diode.

**Text Books:**

1. Electronic Devices and Circuits - J.Millman, C.C.Halkias, and SatyabrathaJit Tata McGraw Hill, 2nd Ed.,2007.
2. Electronic Devices and Circuits - R.L. Boylestad and Louis Nashelsky, Pearson/Prentice Hall, 9thEdition,2006.
3. Introduction to Electronic Devices and Circuits- Rober T. PaynterPE

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### Reference Books:

1. Electronic Devices and Circuits - T.F. Bogart Jr., J.S.Beasley and G.Rico, Pearson Education, 6th edition,2004.
2. Principles of Electronic Circuits - S.G.Burns and P.R.Bond, Galgotia Publications, 2nd Edn...,1998.
3. Microelectronics - Millman and Grabel, Tata McGraw Hill,1988. 4. Electronic Devices and Circuits - Dr. K. Lal Kishore,B.S.

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# ANURAG ENGINEERING COLLEGE

Ananthagiri(V&M),Suryapet(Dt)-508206 A.P Ph:08683-272555,272456,272221

Academic Year 2023-24

I B.Tech II Semester Consolidated Time Table

w.e.f 02.05-2024

DAY / PERIOD	Branch	I	II	BREAK	III	BREAK	IV	V	BREAK	VI	VII
		09.30 - 10:20	10.20 - 11.10	11.10 - 11.20	11.20 - 12.10	12.10 - 12.50	12.50 - 01.35	01.35 - 02.20	02.20 - 02.30	02.30 - 3.03.15	15 - 04.00
MON	ECE	CAEG				LB UR NE CA HK	ODE	BEE		EDC	Games/Library
	CSE-A	ODE	AP		ESE		EDC	AP		ODE	EDC
	CSE-B	AP	EDC		ES		ODE	ELCS LAB			
	CSE-C	EDC	ODE		AP		ODE	AP		EDC	ESE
	IT	ODE	BEE		EC		EDC	ODE		BEE	EC
	AIML-A	EDC	ODE		AP		ESE	AP/EWS LAB			
	AIML-B	ESE	EDC		ODE		AP	EDC		ODE	AP
TUE	ECE	CAEG				LB UR NE CA HK	EC	EDC		BEE	ODE
	CSE-A	EDC	AP		ODE		ESE	AP/EWS LAB			
	CSE-B	AP/EWS LAB					AP	ODE		EDC	ESE
	CSE-C	ODE	AP		EDC		ES	AP		ESE	EDC
	IT	EDC	ODE		BEE		EC	EC/BEE LAB			
	AIML-A	AP	ODE		EDC		PYTL	AP		ODE	ESE
	AIML-B	ES	CRE		ODE		EDC	ESE		AP	Games/Library
WED	ECE	EC/BEE LAB				LB UR NE CA HK	BEE	ODE		EDC	EC
	CSE-A	AP	CRE		EDC		ODE	PYTL		ES	Games/Library
	CSE-B	AP	EDC		ODE		ESE	AP		ODE	EDC
	CSE-C	CRE	AP		ODE		ESE	AP/EWS LAB			
	IT	BEE	EC		EDC		EDC	BEE		ODE	Games/Library
	AIML-A	ELCS LAB					ES	AP		ODE	ES
	AIML-B	EDC	ODE		AP		CRE	ELCS LAB			
THU	ECE	EDC	ODE		BEE	LB UR NE CA HK	EC	ODE		EC	BEE
	CSE-A	ESE	AP		EDC		CRE	AP		ES	ODE
	CSE-B	ESE	AP		ODE		ES	AP/EWS LAB			
	CSE-C	ELCS LAB					PYTL	ODE		AP	EDC
	IT	EC/BEE LAB					BEE	EC		ODE	COI
	AIML-A	ODE	EDC		AP		EDC	AP		ESE	CRE
	AIML-B	AP/EWS LAB					PYTL	ODE		AP	ESE
FRI	ECE	COI	EC		ODE	LB UR NE CA HK	EDC	EC/BEE LAB			
	CSE-A	ESE	AP		EDC		ODE	AP/EWS LAB			
	CSE-B	EDC	AP		ESE		AP	ODE		EDC	CRE
	CSE-C	ODE	ES		EDC		CRE	AP		ESE	Games/Library
	IT	CAEG					BEE	EDC		EC	ODE
	AIML-A	EDC	ODE		ESE		ES	AP		CRE	Games/Library
	AIML-B	AP/EWS LAB					ESE	ODE		AP	EDC
SAT	ECE	COI	BEE		EC	LB UR NE CA HK	EDC	BEE		ODE	EC
	CSE-A	ESE	AP		ODE		EDC	ELCS LAB			
	CSE-B	ESE	CRE		AP		EDC	ODE		PYTL	Games/Library
	CSE-C	AP/EWS LAB					ESE	ODE		EDC	AP
	IT	EC	ODE		EDC		COI	CAEG			

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AIML-A	EDC	AP		ODE		ESE	AP/EWS LAB			
AIML-B	AP	ODE		EDC		ES	ESE		AP	EDC

### TIME TABLE

#### I B.Tech. II Semester –AIML(A SEC)

Day/Hour	9.30-10.20	10.20-11.10	11.20-12.10	12.10-12.50	12.50-1.35	1.35-2.20	2.30-3.15	3.15-4.00
Monday	EDC							
Tuesday								
Wednesday								EDC
Thursday					EDC			
Friday	EDC							
Saturday	EDC							

#### I B.Tech. II Semester –AIML(B SEC)

Day/Hour	9.30-10.20	10.20-11.10	11.20-12.10	12.10-12.50	12.50-1.35	1.35-2.20	2.30-3.15	3.15-4.00
Monday		EDC						
Tuesday					EDC			
Wednesday	EDC							
Thursday								
Friday								EDC
Saturday			EDC					

## Department of ECE

### **Vision of the Institute**

To be a premier Institute in the country and region for the study of Engineering, Technology and Management by maintaining high academic standards which promotes the analytical thinking and independent judgment among the prime stakeholders, enabling them to function responsibly in the globalized society.

### **Mission of the Institute**

To be a world-class Institute, achieving excellence in teaching, research and consultancy in cutting-edge Technologies and be in the service of society in promoting continued education in Engineering, Technology and Management.

### **Quality Policy**

To ensure high standards in imparting professional education by providing world-class infrastructure, top-quality-faculty and decent work culture to sculpt the students into Socially Responsible Professionals through creative team-work, innovation and research.

### **Vision of the Department**

To generate competent professionals to become part of the Industry and Research Organizations at the National and International levels.

### **Mission of the Department**

- To train the students to have in-depth knowledge of the subjects in the field of Computer Science and Engineering.
- To train the students with leadership qualities, team work skills, commitment and ethics thereby making them develop confidence for R & D activities and for placement in multinational and national.

## Department of ECE

### Program Educational Objectives (B.Tech. –AIML)

#### Graduates will be able to

- PEO 1: Graduates will have broad scientific and engineering knowledge to formulate, analyse and resolve engineering issues in real world.
- PEO 2: Graduates will have the skills they need for a successful career in AI and related fields that meet the needs of the country and businesses.
- PEO 3: Graduates will function effectively in workplace with demonstrable attributes like leadership, lifelong learning, and teamwork in order to meet the requirements of society.

### Program Outcomes (B.Tech. –AIML)

#### At the end of the Program, a graduate will have the ability to

- 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, review research literature, and analyse 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



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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, and 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, as a 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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### COURSE OBJECTIVES

On completion of this Subject/Course the student shall be able to:

S.No	Objectives
1	To introduce components such as diodes,.
2	To know the applications of Diode.
3	To understand the characteristics of the BJT.
4	To understand the characteristics of the JFET and MOSFET.
5	To understand the characteristics of the special purpose devices.

### COURSE OUTCOMES

The expected outcomes of the Course/Subject are:

S.No	Outcomes
1.	Analyze the PN Junction diode operation and its characteristics
2.	Know the applications of Diode such as clippers and clampers.
3.	Analyze the characteristics of BJT.
4.	Analyze the characteristics of FET.
5.	Understand the concept of special purpose devices

Signature of faculty

Note: Please refer to Bloom's Taxonomy, to know the illustrative verbs that can be used to state the outcomes.

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### GUIDELINES TO STUDY THE COURSE / SUBJECT

#### **Course Design and Delivery System (CDD):**

- The Course syllabus is written into number of learning objectives and outcomes.
- Every student will be given an assessment plan, criteria for assessment, scheme of evaluation and grading method.
- The Learning Process will be carried out through assessments of Knowledge, Skills and Attitude by various methods and the students will be given guidance to refer to the text books, reference books, journals, etc.

#### **The faculty be able to –**

- Understand the principles of Learning
- Understand the psychology of students
- Develop instructional objectives for a given topic
- Prepare course, unit and lesson plans
- Understand different methods of teaching and learning
- Use appropriate teaching and learning aids
- Plan and deliver lectures effectively
- Provide feedback to students using various methods of Assessments and tools of Evaluation
- Act as a guide, advisor, counselor, facilitator, motivator and not just as a teacher alone

Signature of HOD

Signature of faculty

Date:

Date:

## Department of ECE

### COURSE SCHEDULE (I AIML-A)

The Schedule for the whole Course / Subject is:

S. No.	Description	Duration (Date)		Total No. of Periods
		From	To	
1.	<b>Unit-I: Diodes</b> Diode - Static and Dynamic resistances, Equivalent circuit, Diffusion and Transition Capacitances, V-I Characteristics of Diode, Diode as a switch- switching times.	5.2.2024	24.2.2024	15
2.	<b>Unit-II: Diode Applications</b> Rectifier - Half Wave Rectifier, Full Wave Rectifier, Bridge Rectifier, Rectifiers with Capacitive and Inductive Filters <b>Clippers and Clampers:</b> Clippers-Clipping at two independent levels, Clamper-Clamping Circuit Theorem, Clamping Operation, Types of Clampers.	26.2.2024	19.3.2024	15
3.	<b>Unit-III: Bipolar Junction Transistor (BJT)</b> Principle of Operation, Common Emitter, Common Base and Common Collector Configurations, Transistor as a switch, switching times.	21.3.2024	18.4.2024	7
4.	<b>Unit-IV: Junction Field Effect Transistor (FET)</b> Construction, Principle of Operation, Pinch-Off Voltage, Volt-Ampere Characteristic, Comparison of BJT and FET, FET as Voltage Variable Resistor, MOSFET, MOSTET as a capacitor.	19.4.2024	6.5.2024	10
5.	<b>Unit-V: Special Purpose Devices</b> Zener Diode - Characteristics, Zener diode as Voltage Regulator, Principle of Operation - SCR, Tunnel diode, UJT, Varactor Diode, Photo diode, Solar cell, LED, Schottky diode.	7.5.2024	12.6.2024	10

Total No. of Instructional periods available for the course: 63 Hours + 2hr (Mid-I Exam)

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### SCHEDULE OF INSTRUCTIONS - COURSE PLAN

Unit No.	Lesson No.	Date	No. of Periods	Topics / Sub-Topics	Objectives & Outcomes Nos.	References (Textbook, Journal)
1.	1	5.2.2024 7.2.2024	2	Introduction to Electronic Devices and Circuits, Classification of semiconductor materials	1 1	Electronic Devices and Circuits - J.Millman
	2	8.2.2024 9.2.2024	2	Unit-I: Introduction to PN Junction Diode, PN junction as a Diode	1 1	Electronic Devices and Circuits - J.Millman
	3	12.2.2024 15.2.2024	2	Working of PN Junction Diode, V-I Characteristics of PN Junction Diode	1 1	Electronic Devices and Circuits - J.Millman
	4	16.2.2024 17.2.2024	2	Diode current equation, Effect of temperature on V-I characteristics of Diode	1 1	Electronic Devices and Circuits - J.Millman
	5	19.2.2024	2	Diode equivalent circuits	1 1	Electronic Devices and Circuits - J.Millman
	6	21.2.2024	1	Diode resistances: Static & Dynamic resistances	1	Electronic Devices and Circuits - J.Millman
	7	22.2.2024	2	Diffusion capacitance, Transition capacitance	1	Electronic Devices and Circuits - J.Millman
	8	23.2.2024 24.2.2024	2	Diode as a switch, Diode switching times and its characteristics	1 1	Electronic Devices and Circuits - J.Millman
2.	1	26.2.2024 28.2.2024	2	Problems based on Diodes, Unit –II: Introduction to Diode applications	2 2	Electronic Devices and Circuits - R.L. Boylestad
	2	29.2.2024	1	Half wave Rectifier	2 2	Electronic Devices and Circuits - R.L. Boylestad
	3	1.3.2024	2	Center-tapped Full wave Rectifier, Bridge full wave Rectifier	2 2	Electronic Devices and Circuits - R.L. Boylestad
	4	4.3.2024	2	Comparison of Rectifiers,	2	Electronic Devices and

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		6.3.2024		Capacitor filter with Rectifiers	2	Circuits - R.L. Boylestad
	5	7.3.2024 11.3.2024	2	Inductor filter with Rectifiers, Clippers, Classification of clippers	2 2	Electronic Devices and Circuits - R.L. Boylestad
	6	13.3.2024 14.3.2024	2	Series and shunt clipper, Clipping at two independent levels	2 2	Electronic Devices and Circuits - R.L. Boylestad
	7	15.3.2024	2	Clampers, Classification of clampers	2 2	Electronic Devices and Circuits - R.L. Boylestad
	8	16.3.2024 16.3.2024	2	Negative Clamper, Positive Clamper	2 2	Electronic Devices and Circuits - R.L. Boylestad
	9	18.3.2024 19.3.2024	2	Clamping circuit theorem, Problems based on Diode applications	2 2	Electronic Devices and Circuits - R.L. Boylestad
3.	1	21.3.2024	1	Unit III: Introduction to BJT	3	Electronic Devices and Circuits - J.Millman
	2	22.3.2024	1	Construction and operation of BJT(NPN&PNP)	3	Electronic Devices and Circuits - J.Millman
	3	23.3.2024	1	Common Base Configuration	3	
	3	27.3.2024	1	Common Emitter Configuration	3	Electronic Devices and Circuits - J.Millman
	4	28.3.2024	1	Common Collector Configuration	3	Electronic Devices and Circuits - J.Millman
	5	30.3.2024	1	Relation between Alpha, Beta & Gamma	3	Electronic Devices and Circuits - J.Millman
	6	2.4.2024	2	<b>Mid-I Exam</b>		
	7	18.4.2023	1	Transistor as a switch & switching times	3	Electronic Devices and Circuits - J.Millman
4.	1	19.4.2024	1	Unit IV: Introduction to JFET	4	Electronic Devices and Circuits - R.L. Boylestad
	2	22.4.2024 1.5.2024	2	Construction & operation of N-channel JFET, Construction & operation of P-channel JFET	4 4	Electronic Devices and Circuits - R.L. Boylestad
	3	2.5.2024	2	Differences between BJT & FET, Construction & operation of E-MOSFET	4 4	Electronic Devices and Circuits - R.L. Boylestad
	4	3.5.2024 4.5.2024	2	Construction & operation of D-MOSFET, V-I characteristics of D-MOSFET, E-MOSFET	4 4	Electronic Devices and Circuits - R.L. Boylestad
	5	6.5.2024	1	MOSFET as a capacitor	4 4	Electronic Devices and Circuits - R.L. Boylestad

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5	1	7.5.2024	1	Unit V: Special Purpose Devices	5	Introduction to Electronic Devices and Circuits- Rober T. PaynterPE
	2	9.5.2024	2	Zener diode and its voltage regulator, Silicon controlled rectifier	5 5	Introduction to Electronic Devices and Circuits- Rober T. PaynterPE
	3	10.5.2024	1	Tunnel diode	5	Introduction to Electronic Devices and Circuits- Rober T. PaynterPE
	4	5.6.2024 6.6.2024	2	Unijunction Transistor, Photo diode and solar cell	5 5	Introduction to Electronic Devices and Circuits- Rober T. PaynterPE
	5	7.6.2024	1	Varactor Diode and Light Emitting Diode	5	Introduction to Electronic Devices and Circuits- Rober T. PaynterPE
	6	10.6.2024	1	Schottky Barrier Diode	5	Introduction to Electronic Devices and Circuits- Rober T. PaynterPE
	7	12.6.2024	1	Revision	5	Introduction to Electronic Devices and Circuits- Rober T. PaynterPE

Signature of HOD

Signature of faculty

Date:

Date:

Note:

1. Ensure that all topics specified in the course are mentioned.
2. Additional topics covered, if any, may also be specified in bold.
3. Mention the corresponding course objective and outcome numbers against each topic.

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### COURSE SCHEDULE (I AIML-B)

The Schedule for the whole Course / Subject is:

S. No.	Description	Duration (Date)		Total No. of Periods
		From	To	
1.	<b>Unit-I: Diodes</b> Diode - Static and Dynamic resistances, Equivalent circuit, Diffusion and Transition Capacitances, V-I Characteristics of Diode, Diode as a switch- switching times.	5.2.2024	28.2.2024	15
2.	<b>Unit-II: Diode Applications</b> Rectifier - Half Wave Rectifier, Full Wave Rectifier, Bridge Rectifier, Rectifiers with Capacitive and Inductive Filters <b>Clippers and Clampers:</b> Clippers-Clipping at two independent levels, Clamper-Clamping Circuit Theorem, Clamping Operation, Types of Clampers.	1.3.2024	23.3.2024	15
3.	<b>Unit-III: Bipolar Junction Transistor (BJT)</b> Principle of Operation, Common Emitter, Common Base and Common Collector Configurations, Transistor as a switch, switching times.	26.3.2024	22.4.2024	7
4.	<b>Unit-IV: Junction Field Effect Transistor (FET)</b> Construction, Principle of Operation, Pinch-Off Voltage, Volt-Ampere Characteristic, Comparison of BJT and FET, FET as Voltage Variable Resistor, MOSFET, MOSTET as a capacitor.	23.4.2024	6.5.2024	10
5.	<b>Unit-V: Special Purpose Devices</b> Zener Diode - Characteristics, Zener diode as Voltage Regulator, Principle of Operation - SCR, Tunnel diode, UJT, Varactor Diode, Photo diode, Solar cell, LED, Schottky diode.	7.5.2024	12.6.2024	10

Total No. of Instructional periods available for the course: 63 Hours + 2hr (Mid-I Exam)



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**SCHEDULE OF INSTRUCTIONS - COURSE PLAN**

Unit No.	Lesson No.	Date	No. of Periods	Topics / Sub-Topics	Objectives & Outcomes Nos.	References (Textbook, Journal)
1.	1	5.2.2024 6.2.2024	2	Introduction to Electronic Devices and Circuits, Classification of semiconductor materials	1 1	Electronic Devices and Circuits - J.Millman
	2	7.2.2024 9.2.2024	2	Unit-I: Introduction to PN Junction Diode, PN junction as a Diode	1 1	Electronic Devices and Circuits - J.Millman
	3	12.2.2024 16.2.2024	2	Working of PN Junction Diode, V-I Characteristics of PN Junction Diode	1 1	Electronic Devices and Circuits - J.Millman
	4	17.2.2024 19.2.2024	2	Diode current equation, Effect of temperature on V-I characteristics of Diode	1 1	Electronic Devices and Circuits - J.Millman
	5	20.2.2024	1	Diode equivalent circuits	1 1	Electronic Devices and Circuits - J.Millman
	6	21.2.2024	1	Diode resistances: Static & Dynamic resistances	1	Electronic Devices and Circuits - J.Millman
	7	23.2.2024 24.2.2024	2	Diffusion capacitance, Transition capacitance	1	Electronic Devices and Circuits - J.Millman
	8	26.2.2024 27.2.2024 28.2.2024	3	Diode as a switch, Diode switching times and its characteristics, Problems based on Diodes	1 1 1	Electronic Devices and Circuits - J.Millman
2.	1	1.3.2024	2	Unit-II: Introduction to Diode applications, Half wave Rectifier	2 2	Electronic Devices and Circuits - R.L. Boylestad
	2	4.3.2024	1	Center-tapped Full wave Rectifier	2 2	Electronic Devices and Circuits - R.L. Boylestad
	3	5.3.2024	1	Bridge full wave Rectifier	2 2	Electronic Devices and Circuits - R.L. Boylestad
	4	6.3.2024	1	Comparison of Rectifiers,	2 2	Electronic Devices and Circuits - R.L. Boylestad

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	5	11.3.2024	1	Capacitor filter with Rectifiers	2 2	Electronic Devices and Circuits - R.L. Boylestad	
	6	12.3.2024	2	Inductor filter with Rectifiers , Clippers, Classification of clippers	2 2	Electronic Devices and Circuits - R.L. Boylestad	
	7	13.3.2024 15.3.2024	2	Series and shunt clipper, Clipping at two independent levels	2 2	Electronic Devices and Circuits - R.L. Boylestad	
	8	16.3.2024 18.3.2024	2	Clampers, Classification of clampers , Negative Clamper	2 2	Electronic Devices and Circuits - R.L. Boylestad	
	9	19.3.2024 22.3.2024 23.3.2024	3	Positive Clamper , Clamping circuit theorem, Problems based on Diode applications	2 2 2	Electronic Devices and Circuits - R.L. Boylestad	
3.	1	26.3.2024	2	Unit III: Introduction to BJT, Construction and operation of BJT(NPN&PNP)	3 3	Electronic Devices and Circuits - J.Millman	
	2	27.3.2024	1	Common Base Configuration	3 3	Electronic Devices and Circuits - J.Millman	
	3	28.3.2024	2	Common Emitter Configuration, Common Collector Configuration	3 3	Electronic Devices and Circuits - J.Millman	
	4	2.4.2024	2	<b>IMID EXAM</b>			
	5	19.4.2024 22.4.2024	2	Relation between Alpha, Beta & Gamma, Transistor as a switch & switching times	3 3	Electronic Devices and Circuits - J.Millman	
4.	1	23.4.2024	1	Unit IV: Introduction to JFET	4 4	Electronic Devices and Circuits - R.L. Boylestad	
	2	30.4.2024 1.5.2024	2	Construction & operation of N-channel JFET, Construction & operation of P-channel JFET	4 4	Electronic Devices and Circuits - R.L. Boylestad	
	3	3.5.2024	1	Differences between BJT & FET	4 4	Electronic Devices and Circuits - R.L. Boylestad	
	4	4.5.2024	2	Construction & operation of E-MOSFET ,Construction & operation of D-MOSFET	4 4	Electronic Devices and Circuits - R.L. Boylestad	
	5	6.5.2024	2	V-I characteristics of D-MOSFET,E-MOSFET, MOSFET as a capacitor	4 4	Electronic Devices and Circuits - R.L. Boylestad	
5	1	7.5.2024	1	Unit V: Special Purpose Devices	5	Introduction to Electronic Devices and Circuits- Rober T. PaynterPE	

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	2	8.5.2024	1	Zener diode and its voltage regulator	5	Introduction to Electronic Devices and Circuits- Rober T. PaynterPE
	3	10.5.2024	1	Silicon controlled rectifier	5	Introduction to Electronic Devices and Circuits- Rober T. PaynterPE
	4	3.6.2024 4.6.2024	2	Tunnel diode, Unijunction Transistor,	5 5	Introduction to Electronic Devices and Circuits- Rober T. PaynterPE
	5	5.6.2024 8.6.2024	2	Photo diode and solar cell, Varactor Diode and Light Emitting Diode	5 5	Introduction to Electronic Devices and Circuits- Rober T. PaynterPE
	6	10.6.2024	1	Schottky Barrier Diode	5	Introduction to Electronic Devices and Circuits- Rober T. PaynterPE
	7	11.6.2024 12.6.2024	2	Revision	5 5	Introduction to Electronic Devices and Circuits- Rober T. PaynterPE

Signature of HOD

Signature of faculty

Date:

Date:

Note:

1. Ensure that all topics specified in the course are mentioned.
2. Additional topics covered, if any, may also be specified in bold.
3. Mention the corresponding course objective and outcome numbers against each topic.

**Department of ECE**

**LESSON PLAN (U-I)**

Lesson No: 01, 02

Duration of Lessons: 1hr 40 min

Lesson Title: Introduction to Electronic Devices

Instructional / Lesson Objectives:

- To make students understand course structure
- To familiarize students on different electronic components
- To understand students different types of materials
- To familiarize students on classification of semiconductor materials.

Teaching AIDS: PPTs, Black board

Time Management of Class :100 minutes

5 mins for taking attendance 10 mins for previous lecture 75 min for the lecture delivery 10 min for doubts session
--

Refer assignment – I & tutorial-I sheets

Signature of faculty

## Department of ECE

### LESSON PLAN (U-I)

Lesson No: 03, 04

Duration of Lesson: 1hr40 min

Lesson Title: PN junction as a Diode

#### Instructional / Lesson Objectives:

- To make students understand formation of PN junction diode
- To understand students different materials are used to form a Diode .

Teaching AIDS :PPTs, Black board

Time Management of Class :100 minutes

5 mins for taking attendance 10 mins for previous lecture 75 min for the lecture delivery 10 min for doubts session
--

Refer assignment – I & tutorial-I sheets

Signature of faculty

**Department of ECE**

**LESSON PLAN (U-I)**

Lesson No: 05, 06

Duration of Lesson: 1 hr40 min

Lesson Title: V-I characteristics of PN junction Diode

Instructional / Lesson Objectives:

- To familiarize students to draw the characteristics of a Diode
- To understand students the working of PN junction Diode.

Teaching AIDS :PPTs, Black board

Time Management of Class : 100 min.

5 mins for taking attendance 10 for revision of previous class 75 min for lecture delivery 10 min for doubts session
---

Refer assignment – I & tutorial-I sheets

Signature of faculty

**Department of ECE**  
**LESSON PLAN (U-I)**

Lesson No: 07,08

Duration of Lesson: 1hr40 min

Lesson Title: Diode Current Equation, Temperature effect of VI characteristics of Diode

Instructional / Lesson Objectives:

- To understand students to analyse Diode current equation
- To understand students to solve problems based on Diode equation
- To familiarize students to draw the temperature effect of vi characteristics of Diode.

To familiarize students

Teaching AIDS: PPTs, Black board

Time Management of Class : 100 min

<p>5 mins for taking attendance 10 min for revision of previous class. 75 min for the lecture delivery 10 min for doubts session</p>
--

Refer assignment – I & tutorial-I sheets

Signature of faculty

## Department of ECE

### LESSON PLAN (U-I)

Lesson No: 09,10

Duration of Lesson: 1hr 40 MIN

Lesson Title: Diode equivalent circuits ,Diode Resistances

#### Instructional / Lesson Objectives:

- To make students understand the analysis of diode static and dynamic resistances.
- To familiarize students on diode equivalent circuits

Teaching AIDS :PPTs, Black board

Time Management of Class : 100 min.

5 mins for taking attendance 10 min for revision of previous class. 75 min for the lecture delivery 10 min for doubts session
--

Refer assignment-II & tutorial-II sheets.

Signature of faculty



**Department of ECE**

**LESSON PLAN (U-I)**

Lesson No: 11,12

Duration of Lesson: 1hr40 min.

Lesson Title: Diode Capacitances.

Instructional / Lesson Objectives:

- To make students understand different types of diode capacitances
- To familiarize students on analysis of diffusion capacitance
- To familiarize students on analysis of transition capacitance.

Teaching AIDS :PPTs, Black board

Time Management of Class : 100 min.

5 mins for taking attendance 10 min for revision of previous class 75 min for the lecture delivery 10 min for doubts session
---

Refer assignment-II & tutorial-II sheets.

Signature of faculty

**Department of ECE**

**LESSON PLAN (U-I)**

Lesson No: 13,14,15

Duration of Lesson: 2hrs 30 min.

Lesson Title: Diode as a switch and its switching times.

Instructional / Lesson Objectives:

- To make students understand how the diode acts as a switch
- To familiarize students on diode switching times
- To understand students problems based on PN junction Diode.

Teaching AIDS :PPTs, Black board

Time Management of Class : 150 min.

10 mins for taking attendance 20 min for revision of previous class 110 min for the lecture delivery 10 min for doubts session
---

Refer assignment-II & tutorial-II sheets.

Signature of faculty

## Department of ECE

### LESSON PLAN (U-II)

Lesson No: 16, 17,18,19,20

Duration of Lesson: 4 hr10 min

Lesson Title: Diode Applications, Rectifiers.

#### Instructional / Lesson Objectives:

- To make students understand the applications of diode
- To familiarize students on classification of rectifiers
- To understand students the analysis of halfwave,full wave and bridge rectifiers.
- To provide information on differences between rectifiers.

Teaching AIDS :PPTs, Black board

Time Management of Class : 250 min

15 mins for taking attendance 15 mins for previous lecture 200 min for the lecture delivery 20 min for doubts session
--

Refer assignment-II & tutorial-II sheets.

Signature of faculty

**Department of ECE**

**LESSON PLAN (U-II)**

Lesson No: 21,22

Duration of Lesson: 1hr 40 min

Lesson Title: Rectifiers with filters.

Instructional / Lesson Objectives:

- To make students understand the concept and analysis of capacitor filter with full wave rectifier
- To familiarize students on analysis of inductor filter with full wave rectifier.

Teaching AIDS :PPTs, Black board

Time Management of Class : 100 min

5 mins for taking attendance 10 mins for previous lecture 75 min for the lecture delivery 10 min for doubts session
--

Refer assignment-II & tutorial-II sheets.

Signature of faculty

**Department of ECE**

**LESSON PLAN (U-II)**

Lesson No: 23,24,25

Duration of Lesson: 2hr30 min

Lesson Title: Clippers

Instructional / Lesson Objectives:

- To make students understand classification of clippers
- To familiarize students on series clipper and shunt clipper
- To understand students the concept of clipping at two independent levels.

Teaching AIDS :PPTs, Black board

Time Management of Class : 150 min

10 mins for taking attendance 20 for revision of previous class 110 min for lecture delivery 10 min for doubts session
---

Refer assignment-II & tutorial-II sheets.

Signature of faculty

**Department of ECE**

**LESSON PLAN (U-II)**

Lesson No:27,28,29,30

Duration of Lesson: 3hr20 min

Lesson Title: Clampers

Instructional / Lesson Objectives:

- To make students understand the concept of clamper
- To familiarize students on working of negative and positive clamper
- To understand students clamping circuit theorem
- To make students understand the problems based on clippers and clampers.

Teaching AIDS :PPTs, Black board

Time Management of Class : 200 min

20 mins for taking attendance 20 mins for previous lecture 140 min for the lecture delivery 20 min for doubts session
--

Refer assignment-II & tutorial-II sheets.

Signature of faculty

**Department of ECE**

**LESSON PLAN (U-III)**

Lesson No: 31,32,33,34,35

Duration of Lesson: 4hr10 min

Lesson Title: Introduction to Bipolar junction transistor (BJT)

Instructional / Lesson Objectives:

- To make students understand the construction of BJT(NPN &PNP)
- To familiarize students on functioning of n-p-n and p-n-p transistor.
- To understand students the concept of different working regions in BJT.
- To familiarize students on input and output characteristics of CB,CE,CC configurations.

Teaching AIDS :PPTs, Black board

Time Management of Class : 250 min

25 mins for taking attendance 30 min for revision of previous class. 160 min for the lecture delivery 35 min for doubts session
--

Refer assignment-III & tutorial-III sheets.

Signature of faculty

**Department of ECE**

**LESSON PLAN (U-III)**

Lesson No: 36,37

Duration of Lesson: 1hr 40 min

Lesson Title: Mid I examination

Signature of faculty



**Department of ECE**

**LESSON PLAN (U-III)**

Lesson No: 38,39

Duration of Lesson: 1 hr 40 min

Lesson Title: Transistor as a switch

Instructional / Lesson Objectives:

- To make students understand the relation between alpha,beta,gamma
- To familiarize students on working of a transistor as a switch
- To understand students the different transistor switching times.

Teaching AIDS :PPTs, Black board

Time Management of Class : 100 min.

10 mins for taking attendance 10 mins for previous lecture 70 min for the lecture delivery 10 min for doubts session
---

Refer assignment-III & tutorial-III sheets.

Signature of faculty

**Department of ECE**

**LESSON PLAN (U-IV)**

Lesson No: 40,41,42,43

Duration of Lesson: 3 hr20 min

Lesson Title: Introduction to JFET

Instructional / Lesson Objectives:

- To make students understand the construction and working of N-channel JFET
- To make students understand the construction and working of P-channel JFET
- To familiarize students on differences between BJT and FET.

Teaching AIDS :PPTs, Black board

Time Management of Class : 200 min

10 mins for taking attendance 20 min for revision of previous class. 150 min for the lecture delivery 20 min for doubts session
--

Refer assignment – IV& tutorial-IV sheets

Signature of faculty

**Department of ECE**

**LESSON PLAN (U-IV)**

Lesson No: 44,45,46,47

Duration of Lesson: 3 hr20 min

Lesson Title: MOSFET

Instructional / Lesson Objectives:

- To make students understand the classification of MOSFET
- To understand students the construction and operation of E-MOSFET & D-MOSFET
- To familiarize students on V-I characteristics of E-MOSFET & D-MOSFET
- To make students understand the MOSFET as a capacitor.

Teaching AIDS :PPTs, Black board

Time Management of Class : 200 min

15 mins for taking attendance 15 mins for previous lecture 150 min for the lecture delivery 20 min for doubts session
--

Refer assignment – IV & tutorial-IV sheets

Signature of faculty

**Department of ECE**

**LESSON PLAN (U-V)**

Lesson No: 48,49

Duration of Lesson: 1hr40 MIN

Lesson Title: Introduction to special purpose devices, Zener Diode

Instructional / Lesson Objectives:

- To make students understand the working of Zener diode
- To familiarize students on V-I characteristics of Zener diode
- To understand students on how the Zener diode acts as a voltage regulator.

Teaching AIDS :PPTs, Black board

Time Management of Class : 100 min

10 mins for taking attendance 10 mins for previous lecture 70 min for the lecture delivery 10 min for doubts session
---

Refer assignment – V & tutorial-V sheets

Signature of faculty

## Department of ECE

### LESSON PLAN (U-V)

Lesson No: 50,51,52

Duration of Lesson: 2hr 30 min

Lesson Title: SCR, Tunnel Diode, UJT

#### Instructional / Lesson Objectives:

- To make students understand the operation of silicon controlled rectifier
- To familiarize students on characteristics and operation of Tunnel Diode
- To understand students the concept and characteristics of Uni Junction Transistor.

Teaching AIDS :PPTs, Black board

Time Management of Class : 150 min

10 mins for taking attendance 15 for revision of previous class 110 min for lecture delivery 15 min for doubts session
---

Refer assignment – V & tutorial-V sheets

Signature of faculty

**Department of ECE**

**LESSON PLAN (V)**

Lesson No:53,54,55

Duration of Lesson: 2 hr 30 min

Lesson Title: Photo diode, Solar cell, Varactor diode ,LED, Schottky barrier diode

Instructional / Lesson Objectives:

- To make students understand the construction and working of photo diode
- To familiarize students on characteristics of Photo diode
- To understand students the construction and working of Solar cell
- To understand students the construction and working of varactor diode
- To understand students the construction and working of LED
- To understand students the construction and working of Schottky barrier diode.
- To familiarize students on characteristics of LED, Schottky barrier diode.

Teaching AIDS :PPTs, Black board

Time Management of Class : 150 min

10 mins for taking attendance 15 mins for previous lecture 110 min for the lecture delivery 15 min for doubts session
--

Refer assignment – V & tutorial-V sheets

Signature of faculty

## Department of ECE

### ASSIGNMENT – 1

This Assignment corresponds to Unit No. 1

Question No.	Question	Objective No.	Outcome No.
1	Explain the working of PN Junction diode and illustrate The characteristics in forward and reverse bias?	1	1
2	(A) Define reverse saturation current in PN junction Diode? (B) A Si diode has a reverse saturation current of $2.5\mu\text{A}$ at $300^{\circ}\text{K}$ . Find forward voltage for a forward current of $10\text{Ma}$ .	1	1
3	Derive the expression for diffusion capacitance of a PN Junction diode?	1	1

Signature of HOD

Signature of faculty

Date:

Date:

**Department of ECE****ASSIGNMENT – 2**

This Assignment corresponds to Unit No. 2

Question No.	Question	Objective No.	Outcome No.
1	Draw and explain Half wave Rectifier with the help of Waveforms and derive the following parameters. (i) V DC (ii) Efficiency (iii) Ripple factor (iv) TUF	2	2
2	Design a clipping circuit that clips at two independent Levels.	2	2
3	Explain the operation of positive clamping and Negative clamping circuits.	2	2

Signature of HOD

Signature of faculty

Date:

Date:



**Department of ECE****ASSIGNMENT – 3**

This Assignment corresponds to Unit No. 3

Question No.	Question	Objective No.	Outcome No.
1	Explain the working of NPN and PNP transistors?	3	3
2	Draw and Explain the characteristics of Common Emitter Configuration?	3	3

Signature of HOD

Signature of faculty

Date:

Date:

**Department of ECE****ASSIGNMENT – 4**

This Assignment corresponds to Unit No. 4

Question No.	Question	Objective No.	Outcome No.
1	i) Illustrate the working of N-channel JFET with its Characteristics? ii) Explain how FET acts as a Voltage Variable Resistor?	4	4
2	Explain the construction & working of P-channel Enhancement MOSFET with its characteristics?	4	4

Signature of HOD

Signature of faculty

Date:

Date:

**Department of ECE****ASSIGNMENT – 5**

This Assignment corresponds to Unit No. 5

Question No.	Question	Objective No.	Outcome No.
1	Explain the construction of Zener diode and illustrate the Characteristics in forward bias and reverse bias?	5	5
2	Explain the operation of UJT and draw its characteristics?	5	5

Signature of HOD

Signature of faculty

Date:

Date:

## Department of ECE

### TUTORIAL – 1

This tutorial corresponds to Unit No. 1 (Objective Nos.: 1, Outcome Nos.: 1)

Q1. What type of impurity ions is present in P-type semiconductor?

A) Donor ions B) Acceptor ions C) Both Donor and acceptor ions D) None of these

Q2. What is built-in potential value of Ge Diode?

A) 0.3v B) 0.1v C) 0.9v D) 0.7v

Q3. In forward bias condition, the rise in temperature how the characteristics of Si diode changes

A) Shift right B) shift left C) Constant D) none of these

Q4. In reverse bias condition, for every 10 degree centigrade rise in temperature, the reverse saturation current is

A) Doubled B) Tripled C) Constant D) None of these

Q5. How many valance electrons are present in semiconductor material?

A) =4 B) <4 C) >4 D) none of these

Signature of HOD

Signature of faculty

Date:

Date:

**Department of ECE**

**TUTORIAL – 2**

This tutorial corresponds to Unit No. 2 (Objective Nos.: 2, Outcome Nos.: 2)

Q1. what is the efficiency of Center tapped full wave Rectifier

- A) 40.5%      B) 81.2%      C) 27.8%      D) 121%

Q2. Clamper circuit is also referred as?

- A) DC cutter      B) DC inserter      C) DC lifter      D) DC leveler

Q3. Which circuit is called the Limiter circuit?

- A) chopper circuit B) clipper circuit C) clamper circuit D) chopping circuit

Q4. Rectifier means

- A) AC to DC converter      C) DC to AC converter  
B) AC to Pulsating DC      D) NONE OF THESE

Q5. How many Diodes used in Bridge Rectifier

- A) 1      B) 2      C) 3      D) 4

Signature of HOD

Signature of faculty

Date:

Date:

**Department of ECE**

**TUTORIAL SHEET – 3**

This tutorial corresponds to Unit No. 3 (Objective Nos.: 3, Outcome Nos.: 3)

Q1. Which part of a transistor is heavily doped and emits majority carriers, either electrons or holes?

- A) Collector      B) Emitter      C) Base and Emitter      D) Base

Q2. The number of depletion layers in a transistor is?

- A) 2      B) 3      C) 4      D) 5

Q3. Which among the following configuration has High current and Low voltage gain?

- A) CB      B) CC      C) CE      D) None of these

Q4. BJT transistor consists of how many terminals?

- A) 3      B) 2      C) 1      D) 4

Q5. BJT stands for.....

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Date:

Date:

**Department of ECE**

**TUTORIAL – 4**

This tutorial corresponds to Unit No. 4 (Objective Nos.: 4, Outcome Nos.: 4)

Q1. What are the terminals of FET

- A) Gate Drain Source            C) Base Emitter Collector  
B) Anode Cathode Gate        D) Darian Base Source

Q2. FET Stands for-----

Q3. MOSFET STANDS FOR-----

Q4. \_\_\_\_\_ is a current control device

- A) BJT    B) FET    C) MOSFET    D) VDR

Q5. \_\_\_\_\_ is a voltage control device

- A) BJT            C) FET            B) UJT            D) PN

Signature of HOD

Date:

Signature of faculty

Date:

**Department of ECE**

**TUTORIAL SHEET – 5**

This tutorial corresponds to Unit No. 5 (Objective Nos.: 5, Outcome Nos.: 5)

Q1. SCR stands for.....

Q2. Solar cell can also be called as.....

Q3. Light Emitting Diode converts

A) Electrical to Light energy      B) Light to Electrical energy

C) Electrical to mechanical energy      D) None of these

Q4. Photo diode operates in

A) forward bias      B) reverse bias

C) both forward and reverse      D) none

Q5. What is the range of intrinsic standoff ratio in UJT

A) 0.5 to 0.75      B) 1 to 1.5      C) 2 to 5      D) above 5

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Signature of faculty

Date:

Date:



**Department of ECE**

**EVALUATION STRATEGY**

Target (s)

- a. Percentage of Pass : 85%

Assessment Method (s) (Maximum Marks for evaluation are defined in the Academic Regulations)

- a. Daily Attendance
- b. Assignments
- c. Online Quiz
- d. Continuous Internal Assessment
- e. Semester / End Examination

List out any new topic(s) or any innovation you would like to introduce in teaching the subjects in this semester

Case Study of any one existing application

Signature of HOD

Signature of faculty

Date:

Date:

**Department of ECE****COURSE COMPLETION STATUS**

Actual Date of Completion &amp; Remarks if any

<b>Units</b>	<b>Remarks</b>	<b>Objective No. Achieved</b>	<b>Outcome No. Achieved</b>
Unit 1	completed on 28.02.2024	1	1
Unit 2	completed on 23.03.2024	2	2
Unit 3	completed on 22.04.2024	3	3
Unit 4	completed on 06.05.2024	4	4
Unit 5	completed on 12.06.2024	5	5

Signature of HOD

Signature of faculty

Date:

Date:

## Department of ECE

### Mappings

#### 1. Course Objectives-Course Outcomes Relationship Matrix

(Indicate the relationships by mark “X”)

Course-Objectives \ Course-Outcomes	1	2	3	4	5
1	H				
2		H			
3			H		
4				H	
5					H

#### 2. Course Outcomes-Program Outcomes (POs) & PSOs Relationship Matrix

(Indicate the relationships by mark “X”)

P-Outcomes \ C-Outcomes	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO 1	PSO 2
1	H			M										
2	M	H	M											
3	H													
4	M	L	M	L										
5	H	L		M	M									

H-HIGH M-MODERATE L-LOW

## Department of ECE

### Rubric for Evaluation

Performance Criteria	Unsatisfactory	Developing	Satisfactory	Exemplary
	1	2	3	4
<b><i>Research &amp; Gather Information</i></b>	Does not collect any information that relates to the topic	Collects very little information some relates to the topic	Collects some basic Information most relates to the topic	Collects a great deal of Information all relates to the topic
<b><i>Fulfill team role's duty</i></b>	Does not perform any duties of assigned team role.	Performs very little duties.	Performs nearly all duties.	Performs all duties of assigned team role.
<b><i>Share Equally</i></b>	Always relies on others to do the work.	Rarely does the assigned work - often needs reminding.	Usually does the assigned work - rarely needs reminding.	Always does the assigned work without having to be reminded
<b><i>Listen to other team mates</i></b>	Is always talking— never allows anyone else to speak.	Usually doing most of the talking-- rarely allows others to speak	Listens, but sometimes talks too much.	Listens and speaks a fair amount.

## Department of ECE

## EDC MID I &amp; II PAPERS


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## I B.TECH II SEMESTER I MID EXAMINATIONS - APRIL 2024

Branch : B.Tech. (Common to All)

Max. Marks: 30

Date : 02 - Apr - 2024 AN

Time: 120 Minutes

Subject : Electronic Devices and Circuits, EC205ES

PART - A

ANSWER ALL QUESTIONS

10 X 1 M = 10 M

Q.No	Question		CO	BTL
1.	Write diode current equation	( )	CO1	L2
2.	An ideal diode in forward-bias acts as (A). Buffer (B). Multiplier (C). Closed switch (D). Open switch	( )	CO1	L1
3.	VI characteristics of pn junction diode is (A). Linear (B). non linear (C). decreasing (D). none of the above	( )	CO1	L2
4.	Define reverse saturation current of PN junction diode	( )	CO1	L2
5.	Define efficiency and what is the efficiency of halfwave and fullwave rectifier	( )	CO2	L1
6.	Define clipper	( )	CO2	L1
7.	Define Rectifier	( )	CO2	L1
8.	what do you meant by clamper	( )	CO2	L1
9.	What is the increasing order for size of BJT terminals (A). base<emitter<collector (B). collector<emitter<base (C). base<collector<emitter (D). none of the above	( )	CO3	L2
10.	What is the order of doping concentration for regions of BJT (A). base>emitter>collector (B). emitter>base>collector (C). base<collector<emitter (D). none of the above	( )	CO3	L2

PART - B

ANSWER ANY FOUR

4 X 5 M = 20 M

Q.No	Question		CO	BTL
11.	With neat diagram explain the working of pn junction diode in forward bias and reverse bias with volt-ampere characteristics		CO1	L2
12.	Explain volt-ampere characteristics of pn junction diode and show the effect of temperature on it		CO1	L2
13.	Explain the working of bridge rectifier with the help of waveforms and also derive its efficiency		CO2	L2
14.	Explain the working of halfwave rectifier with the help of waveforms and also derive its ripple factor		CO2	L2
15.	Explain the operation of PNP Transistor		CO3	L2
16.	With neat diagram explain the input-output characteristics of BJT for CB configuration		CO3	L3

## Department of ECE



### I B.TECH II SEMESTER II MID EXAMINATIONS - JUNE 2024

**Branch : B.Tech. COMMON TO ALL**

**Date : 19-Jun-2024      Session : Afternoon**

**Subject : Electronic Devices and Circuits, EC205ES**

**Max. Marks : 30M**

**Time : 120 Min**

#### PART - A

**ANSWER ALL THE QUESTIONS**

**10 X 1M = 10M**

Q.No	Question	CO	BTL
1.	What are the application of transistors.	CO3	L1
2.	What is saturaion and cut off region.	CO3	L1
3.	MOSFET stands for _____	CO4	L1
4.	Write relation between FET parameters.	CO4	L1
5.	FET is _____ Variable resistor (A). Current (B). Voltage (C). Power (D). Channel	CO4	L1
6.	Draw Symbol of N-channel JFET	CO4	L1
7.	Draw symbol of UJT.	CO5	L1
8.	Draw Characteristics of Solar Cell	CO5	L1
9.	Draw symbol of LED.	CO5	L1
10.	What are the applications of Photo Diode.	CO5	L1

#### PART - B

**ANSWER ANY FOUR**

**4 X 5M = 20M**

Q.No	Question	CO	BTL
11.	Draw and explain input and output characteristics of of BJT CE configuration.	CO3	L3
12.	Explain Transistor switching characteristics in detail.	CO3	L4
13.	Explain construction , working and V-I Characteristics of N-channel Depletion MOSFET.	CO4	L3
14.	Compare BJT and FET.	CO4	L3
15.	Explain operation, V-I Characteristics of UJT.	CO5	L3
16.	Explain operation, V-I Characteristics of Varactor Diode.	CO5	L3

## Department of ECE

### Internal Marks (CSE-AIML)

### Continuous Internal Assessment (R-22)

Programme: **B.Tech. (CSE-AIML)**Year: **I**Course: **Theory**A.Y: **2023-24**Course: **EDC** Section: **A&B**Faculty Name: **Mrs.G.SHOBHA**

S. No	Roll No	MID-I (30M)	MID-II (30M)	Avg. of MID I & II(30M)	Avg. of assignment I & II(5M)	Viva- Voce/Poster Presentation (5M)	Total Marks (40)
1	23C11A6601	11	AB	6	3	5	14
2	23C11A6602	7	6	7	4	5	16
3	23C11A6603	23	23	23	5	5	33
4	23C11A6604	25	29	27	5	5	37
5	23C11A6605	14	14	14	3	5	22
6	23C11A6606	14	19	17	5	5	27
7	23C11A6607	30	22	26	5	5	36
8	23C11A6608	4	AB	2	0	4	6
9	23C11A6609	26	28	27	5	5	37
10	23C11A6610	13	5	9	5	5	19
11	23C11A6611	22	22	22	5	5	32
12	23C11A6612	AB	AB	0	0	AB	0
13	23C11A6613	29	30	30	5	5	40
14	23C11A6614	18	22	20	5	4	29
15	23C11A6615	16	20	18	3	5	26
16	23C11A6616	8	8	8	3	5	16
17	23C11A6617	7	6	7	0	4	11
18	23C11A6618	10	13	12	4	5	21

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19	23C11A6619	13	16	15	5	5	25
20	23C11A6620	20	23	22	5	5	32
21	23C11A6622	15	19	17	5	5	27
22	23C11A6623	21	22	22	5	5	32
23	23C11A6624	14	19	17	5	5	27
24	23C11A6625	5	9	7	5	5	17
25	23C11A6627	5	9	7	3	5	15
26	23C11A6628	7	8	8	5	5	18
27	23C11A6629	28	29	29	5	5	39
28	23C11A6630	12	10	11	5	5	21
29	23C11A6631	7	11	9	3	5	17
30	23C11A6632	16	13	15	5	5	25
31	23C11A6633	18	20	19	5	5	29
32	23C11A6634	18	23	21	5	5	31
33	23C11A6635	10	12	11	3	5	19
34	23C11A6636	16	21	19	5	5	29
35	23C11A6637	4	12	8	5	5	18
36	23C11A6638	14	9	12	5	5	22
37	23C11A6639	20	28	24	5	5	34
38	23C11A6640	25	29	27	5	5	37
39	23C11A6641	26	26	26	5	5	36
40	23C11A6642	21	27	24	5	5	34
41	23C11A6643	13	17	15	4	5	24
42	23C11A6644	28	23	26	5	5	36
43	23C11A6645	17	21	19	5	5	29
44	23C11A6646	6	10	8	5	5	18



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45	23C11A6647	26	29	28	5	5	38
46	23C11A6648	17	12	15	5	5	25
47	23C11A6649	19	28	24	5	5	34
48	23C11A6650	24	22	23	5	5	33
49	23C11A6651	10	11	11	5	5	21
50	23C11A6652	27	29	28	5	5	38
51	23C11A6653	20	16	18	5	5	28
52	23C11A6654	19	24	22	5	5	32
53	23C11A6655	26	30	28	5	5	38
54	23C11A6656	20	28	24	5	5	34
55	23C11A6657	11	15	13	5	4	22
56	23C11A6658	27	30	29	5	5	39
57	23C11A6659	25	26	26	5	5	36
58	23C11A6660	23	12	18	5	5	28
59	23C11A6661	18	11	15	5	5	25
60	23C11A6662	23	24	24	5	5	34
61	23C11A6663	26	30	28	5	5	38
62	23C11A6664	15	12	14	5	5	24

**No. of Absentees: 01**

**Total Strength: 62**

**Signature of Faculty**

:

**Signature of HoD**

## Department of ECE

### Internal Marks (CSE-AIML)

### Continuous Internal Assessment (R-22)

Programme: **B.Tech. (CSE-AIML)**Year: **I**Course: **Theory**A.Y: **2023-24**Course: **EDC** Section: **A&B**Faculty Name: **Mrs.G.SHOBHA**

S. No	Roll No	MID-I (30M)	MID-II (30M)	Avg. of MID I & II(30M)	Avg. of assignment I & II(5M)	Viva- Voce/Poster Presentation (5M)	Total Marks (40)
1	23C11A6665	27	27	27	5	5	37
2	23C11A6666	AB	AB	0	0	4	4
3	23C11A6667	10	22	16	5	5	26
4	23C11A6668	21	27	24	5	5	34
5	23C11A6669	28	29	29	5	5	39
6	23C11A6670	29	30	30	5	4	39
7	23C11A6671	25	26	26	5	5	36
8	23C11A6672	25	25	25	5	5	35
9	23C11A6673	18	23	21	5	5	31
10	23C11A6674	17	AB	9	0	AB	9
11	23C11A6675	14	23	19	5	5	29
12	23C11A6676	22	27	25	5	5	35
13	23C11A6677	11	18	15	5	5	25
14	23C11A6678	25	24	25	5	5	35
15	23C11A6679	9	13	11	5	5	21
16	23C11A6680	17	15	16	5	5	26
17	23C11A6681	16	23	20	5	5	30
18	23C11A6682	26	24	25	5	5	35

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19	23C11A6683	10	13	12	5	5	22
20	23C11A6684	16	23	20	5	5	30
21	23C11A6685	30	30	30	5	5	40
22	23C11A6686	15	22	19	3	4	26
23	23C11A6687	20	28	24	5	5	34
24	23C11A6688	7	16	12	5	5	22
25	23C11A6689	23	28	26	5	5	36
26	23C11A6690	16	16	16	5	5	26
27	23C11A6691	16	21	19	3	5	27
28	23C11A6692	11	15	13	3	5	21
29	23C11A6693	12	19	16	5	5	26
30	23C11A6694	24	27	26	5	5	36
31	23C11A6695	21	25	23	3	5	31
32	23C11A6696	14	23	19	5	5	29
33	23C11A6697	24	28	26	3	5	34
34	23C11A6698	AB	AB	0	3	3	6
35	23C11A6699	9	3	6	3	5	14
36	23C11A66A1	24	27	26	5	5	36
37	23C11A66A2	21	28	25	5	4	34
38	23C11A66A3	30	29	30	5	5	40
39	23C11A66A4	29	22	26	5	5	36
40	23C11A66A5	25	29	27	5	5	37
41	23C11A66A6	21	21	21	5	5	31
42	23C11A66A7	5	4	5	5	5	15
43	23C11A66A8	28	28	28	5	5	38
44	23C11A66A9	21	30	26	5	5	36

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45	23C11A66B0	22	21	22	3	5	30
46	23C11A66B1	16	21	19	5	5	29
47	23C11A66B2	13	15	14	5	5	24
48	23C11A66B3	AB	AB	0	0	AB	0
49	23C11A66B4	26	28	27	5	5	37
50	23C11A66B5	20	26	23	5	4	32
51	23C11A66B6	21	28	25	5	5	35
52	23C11A66B7	25	29	27	5	5	37
53	23C11A66B8	26	26	26	5	5	36
54	23C11A66B9	20	23	22	5	5	32
55	23C11A66C0	23	28	26	5	5	36
56	23C11A66C1	23	24	24	5	5	34
57	23C11A66C2	23	23	23	5	4	32
58	23C11A66C3	11	9	10	5	4	19
59	23C11A66C4	12	11	12	3	4	19
60	23C11A66C5	12	25	19	5	4	28
61	23C11A66C6	23	20	22	5	5	32
62	23C11A66C7	21	27	24	5	5	34
63	23C11A66C8	25	26	26	5	5	36

**No. of Absentees: 01**

**Total Strength: 63**

**Signature of Faculty**

:

**Signature of HoD**

**Department of ECE**

**[Sample Answer scripts and Assignments Link](#)**

**<https://drive.google.com/file/d/1YQe7ldvqGIVLT-BnhevEDC04LMTDI-fE/view?usp=sharing>**

**Department of ECE**

**Course materials like Notes, PPT's, etc.**

**Will be attached.**

**EDC Material Link**

**[https://drive.google.com/file/d/1fELkfNZSteTAdESSch\\_acgvEs4L-SNU-/view?usp=sharing](https://drive.google.com/file/d/1fELkfNZSteTAdESSch_acgvEs4L-SNU-/view?usp=sharing)**