Code No: **R204104U** **R20** **Set No. 1**

IV B.Tech I Semester Regular Examinations, January – 2024

BASIC ELECTRONICS

(Common to All Branches except ECE)

Time: 3 hours **Max. Marks: 70**

Answer any FIVE Questions
ONE Question from Each unit
All Questions Carry Equal Marks

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UNIT - I

1	a)	Illustrate the concepts of insulator, semiconductor & conductor with help of energy band structure.	[7]
	b)	Explain the V-I Characteristics of a diode.	[7]
		(OR)	
2	a)	Describe the application of a diode as a Half-Wave Rectifier.	[7]
	b)	Elucidate the need of a filter and Regulator after the rectification process.	[7]

UNIT - II

3	a)	Explain the Zener diode V-I characteristics.	[7]
	b)	Discuss the applications of Zener diode.	[7]
		(OR)	
4	a)	What is varactor diode? Summarize the characteristics.	[7]
	b)	Interpret the working principle of optical diode with neat sketches.	[7]

UNIT - III

5	a)	Make use of transistor CE configuration to explain input, output characteristics and various regions of the configuration in detail.	[7]
	b)	What is the need for transistor biasing? Explain atleast one type of biasing techniques with neat circuit diagram?	[7]
		(OR)	
6	a)	Distinguish the various configurations of transistor.	[7]
	b)	Explicit the application of transistor as a switch.	[7]

UNIT - IV

7	a)	Compare the performance of FET with BJT.	[7]
	b)	Discuss the FET Common Drain Amplifier.	[7]
		(OR)	
8	a)	Elucidate the characteristics and parameters of JFET.	[7]
	b)	Illustrate the drain and transfer characteristics of depletion type MOSFET.	[7]

UNIT - V

9	a)	Discuss the principle of operation and characteristics of Thyristors.	[7]
	b)	Describe the applications of Silicon-Controlled Rectifier.	[7]
		(OR)	
10	a)	Explain the concept of UJT.	[7]
	b)	Discuss the process of light activated SCR.	[7]

Code No: **R204104U** **R20** **Set No. 2**

IV B.Tech I Semester Regular Examinations, January – 2024

BASIC ELECTRONICS

(Common to All Branches except ECE)

Time: 3 hours **Max. Marks: 70**

Answer any FIVE Questions
ONE Question from Each unit
All Questions Carry Equal Marks

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UNIT - I

1	a)	Compare the energy band diagram of metals, insulators and semi-conductor.	[7]
	b)	Explain the diode biasing and also the diode V-I characteristics.	[7]
		(OR)	
2	a)	Distinguish Half-Wave and Full-Wave Rectifiers.	[7]
	b)	Elucidate the steps for AC to DC conversion.	[7]

UNIT - II

3	a)	What is Zener diode? How it is different from a basic diode, compare in all aspects.	[7]
	b)	Discuss how the Zener diode acts as a voltage regulator.	[7]
		(OR)	
4	a)	Explain the characteristics of varactor diode.	[7]
	b)	Illustrate the characteristics of optical diode.	[7]

UNIT - III

5	a)	Explicate the structure and operation of basic transistor.	[7]
	b)	Discuss the characteristics and parameters of transistor.	[7]
		(OR)	
6	a)	Explain the various transistor configurations.	[7]
	b)	Explicit the application of transistor as an amplifier.	[7]

UNIT - IV

7	a)	Write the advantages of JFET. Also compare with BJT.	[7]
	b)	Describe the operation of common drain JFET amplifier and derive the equation for voltage gain.	[7]
		(OR)	
8	a)	Elucidate the characteristics of JFET.	[7]
	b)	Compare JFET with MOSFET.	[7]

UNIT - V

9	a)	Discuss the principle of operation and characteristics of SCR.	[7]
	b)	Describe two applications of Silicon-Controlled Rectifier.	[7]
		(OR)	
10	a)	Draw the equivalent circuit of UJT and also discuss the characteristics.	[7]
	b)	What is the need of optical coupler and explain the concept with neat sketches.	[7]

Code No: **R204104U** **R20** **Set No. 3**

IV B.Tech I Semester Regular Examinations, January – 2024

BASIC ELECTRONICS

(Common to All Branches except ECE)

Time: 3 hours **Max. Marks: 70**

Answer any FIVE Questions
ONE Question from Each unit
All Questions Carry Equal Marks

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UNIT - I

1	a)	Illustrate theFermi level in intrinsic and extrinsic semiconductor materials.	[7]
	b)	Explain theconcept of biasing a diode. What are different diode models?	[7]
		(OR)	
2	a)	Illustrate briefly about power supply filters.	[7]
	b)	Describe the need and types of regulators.	[7]

UNIT - II

3	a)	Distinguish Zener diode and PN junction diode in all aspects.	[7]
	b)	Discuss atleast two applications of Zener diode in detail.	[7]
		(OR)	
4	a)	How varactor diode is different from PN diode. Explain its characteristics.	[7]
	b)	Interpret the different types and applications of optical diode.	[7]

UNIT - III

5	a)	Make use of transistor CB configuration and discuss its input and output characteristics in Detail.	[7]
	b)	What is thermal Runaway in transistor? Explain the method to overcome it.	[7]
		(OR)	
6	a)	Discuss the input and outputcharacteristics of a transistor.	[7]
	b)	Explicit atleast two applications of transistor.	[7]

UNIT - IV

7	a)	Compare JFET with BJT.	[7]
	b)	Describe theCommon Source amplifier with neat diagram.	[7]
		(OR)	
8	a)	Elucidate the different types of JFET basing.	[7]
	b)	Explain the characteristics of MOSFET.	[7]

UNIT - V

9	a)	What is the need of a 4-layer device? Discuss the principle of operation of SCR with neat figure.	[7]
	b)	Draw the equivalent circuit of UJT and also discuss the characteristics.	[7]
		(OR)	
10	a)	Write the advantages of UJT. Distinguish UJT and BJT.	[7]
	b)	Explain the need of photo transistor and also discuss the concept with neat circuit diagram.	[7]

Code No: **R204104U** **R20** **Set No. 4**

IV B.Tech I Semester Regular Examinations, January – 2024

BASIC ELECTRONICS

(Common to All Branches except ECE)

Time: 3 hours **Max. Marks: 70**

Answer any FIVE Questions
ONE Question from Each unit
All Questions Carry Equal Marks

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UNIT - I

1	a)	Give the mathematical analysis and show that the Fermi energy level lies in the centre of forbidden energy band for an intrinsic semiconductor.	[7]
	b)	Describe the terms intrinsic and extrinsic semiconductors of both P type and N type.	[7]
		(OR)	
2	a)	Elucidate the application of a diode as a Full-Wave Rectifier.	[7]
	b)	What is the need of a filter after the rectifier? Classify them.	[7]

UNIT - II

3	a)	Compare Zener diode and PN junction diode in all aspects.	[7]
	b)	Explain how the Zener diode acts as a voltage regulator.	[7]
		(OR)	
4	a)	Illustrate the characteristics of varactor diode.	[7]
	b)	Interpret the different types and applications of optical diode.	[7]

UNIT - III

5	a)	With suitable sketches, explain input and output characteristics of CC Configuration in detail.	[7]
	b)	What is Transistor biasing? Explain about fixed bias Technique.	[7]
		(OR)	
6	a)	Discuss the parameters of a transistor.	[7]
	b)	Explain Transistor acting as an amplifier with neat sketches.	[7]

UNIT - IV

7	a)	Distinguish JFET performance with BJT.	[7]
	b)	Draw the circuit diagram of a Common Source amplifier circuit and explain the importance of each component.	[7]
		(OR)	
8	a)	Draw the small signal model of JFET.	[7]
	b)	Discuss the MOSFET parameters.	[7]

UNIT - V

9	a)	Explain the need of a Thyristor. Discuss the principle of operation and characteristics of Thyristor with neat circuit diagram.	[7]
	b)	Explain the concept of UJT with neat sketches.	[7]
		(OR)	
10	a)	List the advantages of UJT. Compare UJT performance with BJT.	[7]
	b)	What is the need of insulated gate BJT and explain the concept with neat circuit diagram.	[7]