

Code: 23EC3301

**II B.Tech - I Semester – Regular Examinations - DECEMBER 2024****ELECTRONIC DEVICES AND CIRCUITS  
(ELECTRONICS & COMMUNICATION ENGINEERING)**

Duration: 3 hours

Max. Marks: 70

Note: 1. This question paper contains two Parts A and B.

2. Part-A contains 10 short answer questions. Each Question carries 2 Marks.

3. Part-B contains 5 essay questions with an internal choice from each unit. Each Question carries 10 marks.

4. All parts of Question paper must be answered in one place.

BL – Blooms Level

CO – Course Outcome

**PART – A**

		BL	CO
1.a)	Draw the Zener Diode Characteristics.	L2	CO1
1.b)	Draw the Diode Equivalent Circuit. Mention the applications of PN-junction diode.	L2	CO1
1.c)	Explain how P-N junction diode acts as a Rectifier.	L2	CO2
1.d)	Explain the necessity of filter circuit after the rectifier circuit.	L2	CO2
1.e)	Compare CE, CC and CB transistor configurations.	L3	CO3
1.f)	Mention the advantages and disadvantages of self-bias method.	L2	CO3
1.g)	Draw the h-parameter model of a transistor under CE configuration.	L2	CO4
1.h)	What is the small signal model of BJT?	L2	CO4
1.i)	List out the differences between JFET and MOSFET.	L2	CO3
1.j)	Sketch the circuit of source follower.	L2	CO4

## PART – B

			BL	CO	Max. Marks
<b>UNIT-I</b>					
2	a)	Explain the Avalanche and Zener Breakdowns in PN junction diode.	L2	CO1	5 M
	b)	What is tunneling phenomena? Explain the principle of operation of tunnel diode with its characteristics.	L2	CO1	5 M
<b>OR</b>					
3	a)	What is varactor diode? Explain the operation of varactor diode with its equivalent circuit and mention its applications.	L2	CO1	5 M
	b)	Draw and explain the energy band diagram of open circuited P-N junction diode.	L2	CO1	5 M
<b>UNIT-II</b>					
4	a)	Derive the expression for Ripple factor for Full Wave Rectifier with L-section filter.	L4	CO2	5 M
	b)	Write a short notes on Clippers and Clampers.	L2	CO2	5 M
<b>OR</b>					
5	a)	Derive the ripple factor and efficiency of a Half wave rectifier with the help of waveforms.	L4	CO2	5 M

	b)	A full wave rectifier delivers 50 W to a load of 200 ohm. If the ripple factor is 1%, calculate the ac ripple voltage across the load.	L3	CO2	5 M
<b>UNIT-III</b>					
6	a)	Explain input and output characteristics of transistor in CB configuration with neat diagram.	L2	CO3	5 M
	b)	What is the need for biasing what are the factors effecting the operating point in BJT?	L4	CO3	5 M
<b>OR</b>					
7	a)	Derive the expression for stability factor of self-bias circuit.	L4	CO3	5 M
	b)	Explain in detail about Thermal Runaway and Thermal Resistance.	L2	CO3	5 M
<b>UNIT-IV</b>					
8	a)	Draw h-parameter model of a CE transistor and derive the expressions for (i) Current gain (ii) Input impedance (iii) Voltage gain (iv) Output impedance.	L4	CO4	5 M
	b)	Give the advantages of h-parameter analysis.	L2	CO4	5 M
<b>OR</b>					

9	a)	Draw the Common Emitter amplifier circuit diagram and explain its operation in detail.	L2	CO4	5 M
	b)	Explain the determination of h-parameters of a two port network.	L2	CO4	5 M
<b>UNIT-V</b>					
10	Explain the different biasing techniques of JFET.		L2	CO3	10 M
<b>OR</b>					
11	Describe the construction and working principle of Enhancement mode and depletion mode MOSFET and draw its characteristics.		L2	CO3	10 M