

# **SREE SIDDHARTHA INSTITUTE OF TECHNOLOGY, TUMKUR**

(Constituent college of Sri Siddhartha Academy of Higher Education, Tumkur)

Code: ESECI-202

Sub: Basic Electronics Engineering

Date: 06/06/2022

Test-II

Time.1.45 to 2.45 PM

**Answer the following Questions:**

Q.NO		Marks	CO	BL
1	Explain, with the help of a block diagram, the principle of operation of an NPN transistor, showing the depletion regions and barrier potentials.	6	1	1
2	Sketch the transistor common base input and output characteristics. Explain the shape of each set of characteristics.	6	2	2
3	Calculate $I_C$ and $I_E$ for a transistor that has $\alpha = 0.98$ and $I_B = 100 \mu A$ . Also determine the value of $\beta$ for the transistor.	6	2	2
4	Explain the operation of the base bias circuit using an NPN transistor and write the equation for $I_B$ , $I_C$ and $V_{ce}$ .	6	2	2
5	What is an Op-AMP? Mention the ideal characteristics of Op-AMP.	6	1	1



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Code: ESECI-202

Sub: Basic Electronics Engineering

Date: 09.05.2022

Test-1

Time:

Answer the following Questions:

Q.NO		Marks	CO	BL
1	Explain the operation of semiconductor diode with V-I characteristics.	6	2	1
2	Draw the circuit of a bridge rectifier and explain its operation.	6	2	2
3	Explain how Zener diode can be used as a voltage regulator.	6	1	3
4	A germanium diode is used in a rectifier circuit and is operating at a temperature of $25^{\circ}\text{C}$ with a reverse saturation current of $1000\mu\text{A}$ . Calculate the value of forward current if it is forward biased by $0.22\text{V}$ .	6	2	2
5	Explain the avalanche and Zener break down.	6	2	2

**Sri Siddhartha Institute of Technology, Tumkur**  
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**ES-ECI102: BASIC ELECTRONICS**

Date: 09/02/2021  
Time: 9.30-10.30 AM

**TEST1**

Max Marks: 30  
F, G, H, I & J

Q.No		Marks	CO	BL
1.	Explain the V-I characteristics of a semiconductor PN junction diode.	5	1	2
2.	For a silicon diode working at temperature $25^{\circ}\text{C}$ , the forward voltage applied across the diode is 0.5V. Calculate its forward current, if the reverse saturation current is 10nA.	5	1	3
3.	With a neat circuit diagram, explain the working of bridge rectifier with capacitor filter. And also draw input and output waveforms.	5	2	2
4.	A $5\text{k}\Omega$ load is fed from a bridge rectifier connected across a transformer which having $V_{\text{rms}}=23\text{ V}$ . Calculate $I_{\text{dc}}$ , $V_{\text{dc}}$ , efficiency and ripple factor.	5	1	3
5.	Sketch and explain input and output characteristics of a transistor in CE configuration.	5	1	2
6.	Illustrate the relationship between $\alpha$ and $\beta$ of a transistor. And also calculate $\alpha$ , $\beta$ and $I_b$ for a transistor which has $I_c=2.5\text{mA}$ , $I_e=2.6\text{mA}$ .	5	1	3



# SRI SIDDHARTHA INSTITUTE OF TECHNOLOGY, TUMAKURU

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## SUMMER :BASIC ELECTRONICS

Date:22/09/2021

TEST1

Time:1.30Hr

Answer all the questions

		M	C	B
1	With a neat circuit diagram and waveforms explain Bridge rectifier.	8	2	2
2	Sketch and explain input and output characteristics of a transistor in CE configuration.	8	1	2
3	For a silicon diode working at temperature $25^{\circ}\text{C}$ , the forward voltage applied across the diode is $0.5\text{V}$ . Calculate its forward current, if the reverse saturation current is $10\text{nA}$ .	4	1	3
4.	For a <i>fixed base circuit</i> $V_{\text{CC}}=20\text{V}$ , $R_{\text{B}}=470\text{k}\Omega$ , $R_{\text{C}}=2.2\text{k}\Omega$ and $\beta=150$ . Calculate $I_{\text{B}}$ , $I_{\text{C}}$ and $V_{\text{CE}}$ . (Assume $V_{\text{BE}}=0.7\text{V}$ )	10	2	3
5.	Obtain the relationship between $\alpha$ and $\beta$ of a transistor. And also calculate $\alpha$ , $\beta$ and $I_{\text{B}}$ for a transistor which has $I_{\text{C}}=2.5\text{mA}$ , $I_{\text{E}}=2.6\text{mA}$ .	10	1	3
	NOTE: M is marks, C is Course Outcomes and B is Blooms level			



**Sri Siddhartha Institute of Technology, Tumkur**  
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**ES-ECI102: BASIC ELECTRONICS ENGINEERING**

Date: 30/03/2021  
Time: 9.40-10.40 AM

**TEST3**

Max Marks: 20  
F, G, H, I & J

Q.No		Marks	CO	BL
1.	Explain the working of Colpitts oscillator using CE configured transistor.	6	4	2
2.	State and explain barkhausen criteria for obtaining sustained oscillation.	4	4	2
3.	With a neat circuit, Explain the working of single stage RC coupled amplifier and draw its frequency response.	6	2	2
4.	In a hartley oscillator having tank circuit parameters as $L_1=0.1\text{mH}$ and $L_2=1\text{mH}$ . If $C=200\text{pF}$ calculate the frequency of oscillations.	4	2	2