



NARSIMHA REDDY ENGINEERING COLLEGE

UGC AUTONOMOUS INSTITUTION

Maisammaguda (V), Kompally - 500100, Secunderabad, Telangana State, India

UGC - Autonomous Institute

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QUESTION BANK

UNIT-I

S.No	Questions	BT	CO	PO
Part – A (Short Answer Questions)				
1	Define Static and Dynamic resistance of PN diode?	2	1	2
2	What is meant by depletion region?	2	1	1
3	Determine the forward resistance of pn junction diode. When the forward current is 5mA at T=300K assume si diode.	2	1	1
4	Write the effect of temperature on diode characteristics?	4	1	2
5	A silicon diode has a saturation current of 7.5 μ A at room temperature 300K. calculate the saturation current at 400K.	3	1	2
6	Draw the Diode Equivalent Circuit. Mention the applications of PN-junction diode.	3	1	1
7	Write short notes on diode switching times.	4	1	1
8.	Define diffusion capacitance and its formulae.	2	1	1
9.	Define transition capacitance and its formulae.	2	1	1
10.	What is meant by biasing and types of biasing?	2	1	1
11.	Define PN junction diode and draw its symbol.	2	1	1
12.	Define drift and diffusion currents?	2	1	1
13.	What is meant by avalanche breakdown in pn junction diode?	2	1	1
14.	Define (a) storage time of a diode and (b) transition time of a diode	2	1	1
15.	Define (a) diode forward recovery time and (b) diode reverse recovery time.	2	1	1
Part – B (Long Answer Questions)				
16	a) write short notes on load line analysis of PN Diode	4	1	2
	b) Derive the expression for diffusion capacitance of a diode	3	1	3
17	a) Derive the expression for Transition capacitance of PN Diode	3	1	2
	b) Define equivalent circuit of pn junction diode and types of equivalent circuits.	3	1	1
18	a) Describe the action of PN junction diode under forward bias and reverse bias.	4	1	3
	b) Discuss how a diode used as a switch and define all switching times.	3	1	2
19	a) Explain V-I characteristics of a PN junction diode .	3	1	3
	b) Draw and Explain the switching characteristics of a diode.	2	1	1

20	Explain about the temperature dependence of V-I characteristics of PN diode?	1	1	2
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UNIT-II

S.No	Questions	BT	CO	PO
Part – A (Short Answer Questions)				
1.	what is a rectifier and its types	2	2	1
2.	Distinguish between series and shunt clippers	2	2	1
3.	What is the necessity of filter. List the types of filters	2	2	1
4.	Define regulation and efficiency of a rectifier.	2	2	1
5.	Define ripple factor and PIV	2	2	1
6.	Explain the necessity of filter circuit after the rectifier circuit	2	2	1
7.	What are clipping circuits and other names of clipping circuits	1	2	1
8.	What are clamping circuits and other names of clamping circuits	1	2	1
9.	Write a short note on configurations of clipping circuits	1	2	1
10.	What do you mean by one way clamp and two way clamp?	2	2	1
11.	Why the clamping circuit also called a dc inserter?	1	2	1
12.	What is the difference between clipping and clamping?	1	2	1
13.	State clamping circuit theorem?	1	2	1
14.	What do you mean by positive and negative clamping?	1	2	1
15.	What are the advantages of bridge wave rectifier	2	2	1
16.	Compare the performance of L- section and Capacitive filter?	2	2	1

Part – B (Long Answer Questions)					
17	a)	Derive ripple factor for a bridge rectifier?	3	2	1
	b)	Derive expressions for a ripple factor of full wave rectifier with capacitive filter.	3	2	2
18	a)	With neat circuit diagram explain the operation of full wave rectifier and derive the ripple factor, efficiency.	4	2	3
	b)	A half-wave rectifier, having a resistive load of 1000Ω , rectifies an alternating voltage of 325v peak value and the diode has a forward resistance of 100Ω . Calculate (a) peak, average and rms value of current (b) dc power output (c) ac input power and (d) efficiency of the rectifier	2	2	2
19	a)	Derive expressions for a ripple factor of full wave rectifier with inductive filter.	4	2	3
	b)	Explain the operation of negative clamping circuit.	3	2	3
20	a)	State and prove clamping circuit theorem	2	2	2
	b)	With necessary circuit and waveform, explain the switching characteristics of a transistor in detail.	2	2	2
21	a)	Compare FWR and Bridge rectifier.	2	2	2
	b)	Draw the circuit diagram and explain the operation of full wave rectifier using center tap transformer and using bridge rectifier without center tap transformer. Obtain the expression for peak	2	2	1

		inverse voltages of both.			
22	a)	List the differences between filters.	2	2	2
	b)	In a full wave rectifier, the required dc voltage is 9V and the diode drop is 0.8V. Calculate ac rms input voltage required in case of bridge rectifier circuit and center tapped full wave rectifier circuit.	2	2	1
23	a)	Define clipper and discuss any one type of clipper circuit with neat sketch?	2	2	2
	b)	A 230v 50Hz voltage is applied to the primary of a 4:1 step down transformer used in a bridge rectifier having a load resistance of 600Ω . Assuming the diodes to be ideal determine (a) dc output voltage, (b) dc power delivered to the load, (c) PIV, and (d) output frequency.	3	2	1
24		Deign a clipper circuit to get almost square wave as output.	1	2	2

UNIT-III

S.No	Questions	BT	CO	PO
Part – A (Short Answer Questions)				
1	What is a BJT and draw its symbol.	2	3	1
2	What do you mean by early effect.	1	3	1
3	Compare CE, CB and CC configurations	2	3	1
4	Which of the BJT configurations are suitable for impedance matching applications? Why?	2	3	1
5	Write a short notes on switching characteristics of a transistor	2	3	1
6	Write a short note on transistor as a switch	4	3	2
7	What are the three regions of a transistor?	2	3	2
8	In a CB transistor circuit the emitter current I_E is 10mA and collector current is 9.8mA. find the value of the base current I_B	2	3	1
9	If a transistor has α of 0.97, find the value of β . If $\beta = 200$, find the value of α .	2	3	1
10.	Define ON time and OFF time of a transistor.	2	3	1
11.	How are the junctions of a transistor biased for saturation region operation?	1	3	1
12.	When does a transistor act as (a) a closed switch and (b) an open switch?	1	3	1
13.	When the emitter current of a transistor is changed by 1mA, there is a change in collector current by 0.99 mA. Find the current gain of the transistor.	2	3	1
14.	Why we call BJT is a current controlled device?	2	3	1
Part – B (Long Answer Questions)				
15	(a) With neat diagram explain various current components in an PNP/NPN bipolar junction transistor.	3	3	1
	(b) Explain the working of a transistor as a switch.			
16	(a) Draw and explain input and output characteristics of CB configuration	2	3	1
17	a) Draw and explain input and output characteristics of CE configuration	4	3	2
	b) Explain the different operating regions of transistor.	2	3	3
18	a) Draw and explain working principle of CC characteristics of a transistor.	3	3	3
	b) Give the relationship between alpha, beta and gamma of BJT.	2	3	2

UNIT-IV

S.No	Questions	BT	CO	PO
Part – A (Short Answer Questions)				
1	Compare BJT and FET.	2	4	1
2	Define FET and Explain the classification of FET	1	4	1
3	Define Trans conductance of FET?	2	4	1
4	Define MOSFET. How it is different from JFET?	2	4	1
5	What is meant by enhancement mode MOSFET?	2	4	1
6	What is meant by Depletion mode MOSFET?	2	4	1
7	What is a MOSFET? How many types of MOSFETs are there?	2	4	1
8	Write a short note on pinch off voltage	1	4	2
9	Why N- channel MOSFET preferred over P- channel MOSFET?	2	4	1
10	How FET acts as voltage variable resistor?	1	4	1
11	Give the relationship among FET parameters.	2	4	1
12	Draw the symbols of MOSFET?	1	4	1
13	Explain about terminals of JFET.	1	4	1
14	How FET acts as Voltage Variable Resistor?	2	4	1
15	Why the input impedance of FET is higher than BJT?	1	4	1
16	Mention the applications of FET.	2	4	1
Part – B (Long Answer Questions)				
17	a) With the help of a neat diagram explain the operation of an n-channel enhancement type MOSFET	4	4	2
	b) Detail the construction of an p-channel MOSFET of depletion type. Draw and explain its characteristics	4	4	2
18	a) Differentiate Enhancement MOSFET and Depletion MOSFET	4	4	2
	b) With neat sketches, necessary equations explain drain and transfer characteristics of MOSFET in depletion mode.	3	4	3
19	a) Illustrate the working mechanism of JFET with necessary diagram	4	4	3
	b) What is the relation among FET parameters	3	4	3
20	a) Differentiate BJT and FET?	2	4	2
	b) Explain the operation of FET with its characteristics and explain the different regions in its drain characteristics.	1	4	2

UNIT-V

S.No	Questions	BT	CO	PO
Part – A (Short Answer Questions)				
1	Draw zener diode characteristics	2	5	1
2	Write the applications of photo diode and draw its symbol.	2	5	1
3	Write a short notes on varactor diode.	2	5	1
4	Explain voltage regulation using Zener diode.	2	5	1
5	What is tunneling and list out the applications of tunnel diode.	2	5	1
6	What are the applications of UJT	2	5	2
7	Draw V-I characteristics of UJT and explain graph	2	5	2
8	Write short notes on SCR	2	5	2
9	Draw Zener Diode Characteristics.	2	5	2
10	Write short notes on Schottky diode	2	5	1
11	Explain why an SCR is operated only in the forward biased condition.	2	5	1
Part – B (Long Answer Questions)				
12	a) Write short notes on varactor diode	3	5	2
	b) Draw the symbol and equivalent circuit of a UJT. Explain the operation of UJT with the help of its V – I characteristics	4	5	2
13	a) Distinguish between Avalanche and Zener breakdown.	2	5	2
	b) With neat diagram explain the operation of zener diode and its forward and reverse characteristics	3	5	2
14	a) Describe the principle of operation of tunnel diode. Draw its V-I characteristics	3	5	1
	b) Explain the working of semiconductor photo diode. Draw its V-I characteristics.	2	5	1
15	a) Explain the construction of SCR with neat diagram. Draw its V-I characteristics.	4	5	2
	b) With a neat diagram explain the working of Varactor Diode.	4	5	2