CODE No.: 19BT30402 SVEC-19

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

II B.Tech I Semester (SVEC-19) Regular Examinations February – 2021

ELECTRONIC DEVICES AND CIRCUITS

[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours **Max. Marks: 60**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Define the time constant τ of an RC high-pass filter. What is the physical significance of this parameter? When do we treat a transient to have reached its steady state value?	6 Marks	L1	CO1	PO1
	b)	Define rise time t_r of an RC low-pass filter and show that $t_r = 2.2RC$.	6 Marks	L3	CO1	PO1
		(OR)				
2.	a)	Draw the transfer characteristics and explain the operation of a two way clipper.	6 Marks	L2	CO1	PO1
	b)	A symmetrical square wave whose peak to peak amplitude is 2V and whose average value is zero is applied to an RC integrating circuit. The time constant equals the half period of the square wave. Find the peak to peak value of the output amplitude.	6 Marks	L3	CO1	PO2

UNIT-II

3.	a)	What is biasing? Explain the need of it. List out different biasing techniques.	6 Marks	L2	CO2	PO1
	b)	An n-p-n transistor with $\beta = 50$ is used in a common emitter circuit with $V_{CC} = 10V$ and $R_C = 2K$. The bias is obtained by connecting a 100K resistance from collector to base. Assume $V_{BE} = 0$. Find: i) Quiescent point. ii) Stability factor S.	6 Marks	L3	CO2	PO2
		(OR)				
4.	a)	Differentiate bias stabilization and compensation techniques.	6 Marks	L4	CO2	PO1
	b)	Discuss the operation of thermistor compensation.	6 Marks	L2	CO2	PO1

UNIT-III

5.	a)	Why Hybrid parameters are called so? Define them.	6 Marks	L1	CO3	PO1
	b)	Draw the ac equivalent of a CE amplifier with fixed bias using h–parameter model and derive the equations for input impedance, output impedance, voltage gain and current gain.	6 Marks	L3	CO3	PO3
		(OR)				
6.	a)	Derive the equations for voltage gain, current gain, input impedance and output admittance for a BJT using low frequency h – parameter model for CE configuration.	6 Marks	L3	CO3	PO3
	b)	A CE amplifier is drawn by a voltage source of internal resistance $R_s = 1000\Omega$ and the load impedance is a resistance $R_L = 1200\Omega$. The h-parameters are $h_{ie} = 1.2K\Omega$, $h_{re} = 0.0002$, $h_{fe} = 60$ and $h_{oe} = 25\mu A/V$. Compute the current gain A_I, input resistance R_i, Voltage gain A_V and output resistance R_o using approximate analysis.	6 Marks	L3	CO3	PO2

UNIT-IV

7.	a)	Sketch and explain the drain and transfer characteristics of JFET in detail.	6 Marks	L3	CO4	PO1
	b)	Explain the construction and operation of p-channel EMOSFET with the help of static drain characteristics and transfer characteristics.	6 Marks	L2	CO4	PO1
		(OR)				
8.	a)	With the help of neat sketch, explain voltage divider biasing of JFET.	6 Marks	L2	CO4	PO1
	b)	Draw the circuit diagram of common drain amplifier and derive the expression for voltage gain and input resistance.	6 Marks	L3	CO4	PO1

UNIT-V

9.	a)	With a neat sketch, explain the principal of operation of tunnel diode.	6 Marks	L3	CO5	PO1
	b)	Explain the working principle of DIAC and list the applications.	6 Marks	L2	CO5	PO1
		(OR)				
10.	a)	Describe the working of UJT as relaxation oscillator.	6 Marks	L2	CO5	PO1
	b)	Explain the working of varactor diode and list its applications.	6 Marks	L2	CO5	PO1