

THE KAVERY ENGINEERING COLLEGE
(An Autonomous Institution)

B.E/B.TECH DEGREE END SEMESTER THEORY EXAMINATIONS, APRIL-MAY 2025

Third Semester

Electronics and Communication Engineering

EC3353 – Electronic Devices and Circuits

Regulations - 2021

Duration : 3 Hrs

Maximum : 100 Marks

PART – A (ANSWER ALL QUESTIONS) (Marks 10*2=20)

Q.No	Questions	BLT	CO	Marks
1.	Compare Zener and Avalanche breakdown.	L2	1	2
2.	Draw the circuit diagram of a full wave rectifier.	L2	1	2
3.	In CB configuration of transistor, current amplification factor is 0.9. if the emitter current is 1mA, determine the value of collector current.	L3	2	2
4.	How N-channel MOSFET is advantageous over P-channel MOSFET?	L2	2	2
5.	Write the significance of Cascode amplifier and give its applications.	L2	3	2
6.	What is a tuned amplifier? Give its types.	L2	3	2
7.	Identify the reason that positive feedback is not preferred for control purpose.	L2	4	2
8.	In a Colpitt oscillator, $C_1=0.2\mu\text{F}$, $C_2=0.02\mu\text{F}$. If the frequency of the oscillator is 10KHz, determine the value of the inductor.	L3	4	2
9.	Calculate the efficiency of a class B amplifier for a supply voltage of $V_{cc}=24\text{V}$ with peak output voltage of $V_{L(p)}=22\text{V}$.	L3	5	2
10.	Differentiate between class A and class B amplifier.	L2	5	2

PART – B (ANSWER ALL QUESTIONS) (Marks 5*16 = 80)

Q.No	Questions	BLT	CO	Marks
11.	a i Discuss how a depletion layer is formed in a PN junction diode and how does it vary with biasing.	L3	1	8
	ii Derive the equation for diffusion capacitance.	L3	1	8
	Or			
	b i Draw the circuit diagram of a half wave rectifier and discuss its operation.	L3	1	10
	ii How a Zener diode does work as a regulator?	L2	1	6

12.	a i	Explain the input-output characteristics of NPN transistor in CE configuration along with its neat sketches.	L3	2	8
	ii	Derive the relation between α and β of a transistor.	L3	2	8
Or					
	b i	Draw the circuit diagram of MOSFET small signal model and explain its parameters.	L3	2	8
	ii	Sketch the source follower circuit and brief it's working.	L3	2	8
13.	a	With a neat circuit diagram, illustrate the common mode and differential mode analysis of a differential amplifier in detail.	L3	3	16
	Or				
	b	Using suitable diagrams, explain the working of single tuned and double tuned amplifier. Also discuss their gain and frequency response.	L3	3	16
14.	a i	Illustrate the four types of negative feedback amplifier with their neat representation.	L2	4	8
	ii	Bring out the effects of negative feedback amplifier.	L2	4	8
Or					
	b	With a neat diagram, explain the principle of operation of Wien bridge oscillator and derive the expression for its frequency.	L3	4	16
15.	a i	With a neat circuit diagram, explain the operation of class AB amplifier.	L3	5	8
	ii	Draw the characteristics of power MOSFET.	L3	5	8
Or					
	b	Draw the circuit diagram of a Buck-Boost converter and analyse its operation in detail.	L3	5	16