

THE KAVERY ENGINEERING COLLEGE
(An Autonomous Institution)

B.E/B.TECH DEGREE END SEMESTER THEORY EXAMINATIONS, NOV /DEC 2024

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.	What is doping?	RE	1	2
2.	What is meant by the depletion region?	RE	1	2
3.	Define stability factor.	RE	2	2
4.	Why temperature compensation is required?	RE	2	2
5.	Define CMRR.	RE	3	2
6.	Define Q factor.	RE	3	2
7.	Outline the characteristics of negative feedback.	UN	4	2
8.	List out the factors affecting the frequency stability.	RE	4	2
9.	Summarize the condition for the maximum power dissipation in case of class B power amplifier.	UN	5	2
10.	List out the various configurations of switched mode DC to DC converters.	RE	5	2

PART - B (ANSWER ALL QUESTIONS) (Marks 5*13 = 65)

Q.No	Questions	BLT	CO	Marks
11.	a With a neat diagram explain the working of a PN junction diode in forward bias and reverse bias and show the effect of temperature in VI characteristics.	UN	1	13
	Or			
	b Draw the circuit diagram and explain the working of full wave bridge rectifier and derive the expression for average output current and rectification efficiency.	UN	1	13
12.	a Explain the small signal analysis of BJT amplifier – CE, CB, CC.	UN	2	13
	Or			
	b Identify the small signal analysis of MOSFET amplifier and explain in detail.	AN	2	13
13.	a Draw the circuit diagram and classify the working of differential amplifier. Derive the expression for differential mode gain and common mode gain.	AN	3	13
	Or			
	b Examine the various method of neutralization method used in tuned amplifier.	UN	3	13

14.	a	With a neat block diagram, explain the operation of the following feedback amplifiers. a) Voltage series feedback amplifiers b) Current shunt feedback amplifiers	UN	4	13
		Or			
	b	Explain the operation of colpitt's oscillator with neat circuit diagram. Also derive the expression for frequency of oscillation and condition for maintenance of oscillation.	EV	4	13
15.	a	Explain complementary-symmetry class B power amplifier and derive its efficiency.	EV	5	13
		Or			
	b	Classify the structure of power MOSFET and explain its V-I characteristics and list out the features of power MOSFET.	AN	5	13

*PART - C (Marks 1*15 = 15)*

<i>Q.No</i>		<i>Questions</i>	<i>BLT</i>	<i>CO</i>	<i>Marks</i>
16.	a	A given transistor with $I_c = 10$ (collector current), $V_{CE} = 10$ V (collector-emitter voltage) and at room temperature has the following set of low frequency parameters $r_{be} = 500\Omega$, $h_{fe} = 100$, $h_{ie} = 10^{-5}$, $h_{oe} = 10^{-4}$. Design the values of all hybrid π parameters of a low frequency model and draw the equivalent low frequency hybrid π model.	CR	2	15
		Or			
	b	In the differential amplifier assume $\beta = 150$. Examine the DC value of emitter current, collector current, collector voltage, AC voltage gain and AC output voltage. The values are $V_{CC} = +12$, $C_1 = C_2 = 36$, $R_1 = 2$, $R_E = -12$, $E = 33$.	AN	4	15