

Reg.No.:

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VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN
[AUTONOMOUS INSTITUTION AFFILIATED TO ANNA UNIVERSITY, CHENNAI]
Elayampalayam – 637 205, Tiruchengode, Namakkal Dt., Tamil Nadu.

Question Paper Code: 80016

B.E. / B.Tech. DEGREE END-SEMESTER EXAMINATIONS – NOV. / DEC. 2025

Third Semester

Electrical and Electronics Engineering

U23EE304 – ELECTRONIC DEVICES AND CIRCUITS

(Regulation 2023)

Time: Three Hours

Maximum: 100 Marks

Answer ALL the questions

Knowledge Levels	K1 – Remembering	K3 – Applying	K5 - Evaluating
(KL)	K2 – Understanding	K4 – Analyzing	K6 - Creating

PART – A

(10 x 2 = 20 Marks)

Q.No.	Questions	Marks	KL	CO
1.	Summarize the two types of junction capacitances.	2	K2	CO1
2.	Discuss the effect of temperature on semiconductor.	2	K2	CO1
3.	Compare BJT and FET.	2	K2	CO2
4.	Draw the symbol of PNP and NPN transistor.	2	K2	CO2
5.	Mention the procedure to draw the a.c. equivalent of a network.	2	K1	CO3
6.	A common emitter amplifier has an input resistance $2.5K\Omega$ and voltage gain of 200. If the input signal voltage is 5 mV, find the base current of the amplifier.	2	K2	CO3
7.	Why neutralization is important? And give its types.	2	K1	CO4
8.	List out the importance of CMRR.	2	K2	CO4
9.	Show the expression for the frequency of oscillations of a in RC phase shift oscillator.	2	K2	CO5
10.	What is the effect of lower cut off frequency with negative feedback?	2	K2	CO5

PART – B

(5 x 13 = 65 Marks)

Q.No.	Questions	Marks	KL	CO
11. a)	Derive the expression of the space charge or transition capacitance of PN diode under reverse bias with a neat diagram.	13	K2	CO1

		(OR)			
	b)	Describe the action of a full wave bridge rectifier using diodes and give waveforms of input and output voltages.	13	K2	CO1
12.	a)	Explain the construction and working of IGBT with neat diagram.	13	K4	CO2
		(OR)			
	b)	Mention the steps that are taken to design the transistor biasing and stabilizing circuits.	13	K4	CO2
13.	a)	Summarize the expression for gain and frequency response of amplifier using BJT with suitable diagram.	13	K2	CO3
		(OR)			
	b)	i. Describe the h-parameter representation of a transistor.	10	K2	CO3
		ii. Mention the advantages of h-parameter model.	3		
14.	a)	i. Explain the working of class-C power amplifier with diagrams.	7	K1	CO4
		ii. Derive the expression for efficiency of the class-C power amplifier.	6		
		(OR)			
	b)	i. Explain the working of transformer coupled class-A power amplifier with diagrams.	7	K1	CO4
		ii. Derive the expression for efficiency of the class-A power amplifier.	6		
15.	a)	Illustrate the circuit of CE amplifier with current series feedback and obtain the expression for feedback ratio, voltage gain, input resistances and output resistances.	13	K3	CO5
		(OR)			
	b)	Illustrate the CE amplifier with voltage shunt- feedback with neat diagram.	13	K3	CO5

PART – C

(1 x 15 = 15 Marks)

Q.No.	Questions	Marks	KL	CO
16.	a) Determine the frequency of oscillations when a RC phase shift oscillator has $R = 12\text{ k}\Omega$, $C = 0.01\text{ }\mu\text{F}$ and $R_C = 3.3\text{ k}\Omega$. Also find the minimum current gain needed for this purpose.	15	K3	CO5
				(OR)
	b) Design a circuit of Transformer-coupled two stage amplifier.	15	K3	CO5