MUTHAYAMMAL ENGINEERING COLLEGE

(An Autonomous Institution)

(Approved by AICTE, New Delhi, Accredited by NAAC & Affiliated to Anna University)
Rasipuram - 637 408, Namakkal Dist., Tamil Nadu.

Estd. 2000

IQAC

MUST KNOW CONCEPTS

MKC

EEE

2021-22

Course Code & Course Name :**19GES33 & Electronic Devices & Circuits**

Year / Sem : **II / III**

S.No.	Term	Notation (Symbol)	Concept / Definition / Meaning / Units / Equation / Expression	Units
Unit-I : Application of Semiconductor Devices				
1.	Semiconductor	-	Semiconductor is a substance has its resistivity in between conductors and insulators.	-
2.	Conductors	-	The substances, which allow electric current to pass through them, are called conductors.	-
3.	Insulator	-	Material, which does not allow the passage of electric current through them.	-
4.	Doping	-	The process of adding impurities to an intrinsic semiconductor is called doping.	-
5.	Intrinsic Semiconductor	-	Semiconductor in an extremely pure form is called intrinsic semiconductor. Its valence shell must be tetravalent in nature.	-
6.	Extrinsic Semiconductor	-	Semiconductor in an impure form is called extrinsic semiconductor.	-
7.	Valence Band	-	The range of energy possessed by valence electron in an atom is called Valence band.	-
8.	Conduction Band	-	The range of energy possessed by conduction electron in an atom is called conduction band.	-
9.	Diode		Semiconductor device which allows current flow in one direction only - (anode) to (cathode).	-

10.	Breakdown voltage	-	The reverse voltage at which the PN Junction breaks down with sudden rise in reverse current.	-
11.	Biasing	-	To use the transistor in any application it is necessary to provide sufficient voltage and current to operate the transistor. This is called biasing.	-
12.	SCR	-	A silicon controlled rectifier or semiconductor controlled rectifier is a four-layer solid-state current-controlling device.	-
13.	Power Rating	-	Pd= V f x I f.	-
14.	Forward Resistance	-	The resistance offered by the diode in its forward biased condition when a voltage is given is called forward resistance.	-
15.	Transition Capacitance	-	The P-N region on either of the dielectric media act as the plates hence we have components for making a plate capacitor the junction capacitance is called transition capacitance.	-
16.	Rectifier	-	A rectifier is a device which converts AC (Alternating current) to DC (Direct current).	-
17.	Types of rectifiers	-	Half wave rectifier, Full wave center tap rectifier and Full wave bridge rectifier.	-
18.	Maximum efficiency (η) of a half wave	-	Half wave rectifier – 40.6%	-
19.	Maximum efficiency (η) of a full wave	-	Full wave rectifier – 81.2%.	-
20.	Form factor	-	It is the ratio of the RMS value to the Average value.	-
21.	Peak factor	-	The ratio of maximum value to the RMS value.	-
22.	Drift current	-	This drift movement of charge carriers will result in a current termed as drift current.	-

23.	Zener Diode		Zener diode is a p-n junction diode specially designed for operation in the breakdown region in reverse bias condition.	-
24.	LED	-	Light-emitting diodes are usually placed behind the screen or around the edges.	-
25.	LCD	-	Fluorescent lights used are usually placed behind the screen.	-
Unit-II : Transistors				
26.	BJT	-	It is a semiconductor device which can be used for switching or amplification	-
27.	UJT	-	It is an electronic semiconductor device that has only one p-n junction.	-
28.	Types of Transistor	-	BJT,UJT,MOSFET,IGBT,JFET	-
29.	MOSFET	-	The metal–oxide–semiconductor field-effect transistor	-
30.	IGBT	-	It is a three-terminal semiconductor switching device that can be used for fast switching with high efficiency	-
31.	Thyristor	-	Thyristors are semiconductor devices that can operate only in the switching mode.	-
32.	Transistor	-	A transistor is a semiconductor device used to amplify or switch electronic signals and electrical power	-
33.	Firing Angle of Thyristor	-	The phase angle of the ac supply voltage when the GATE current is applied and thyristor turns ON.	-
34.	JFET	-	Junction field-effect transistor.	-
35.	NPN Bipolar Transistor		Allows current flow when high potential at base	-
36.	PNP Bipolar Transistor		Allows current flow when low potential at base	-
37.	Rise time	t_r	Time required for the current to rise from 0 to 90 percentage of the maximum value	Sec

38.	Cut-in voltage	-	Forward voltage at which the current through the junction starts increasing	-
39.	Features of Thyristor	-	Conducts current only when forward biased and triggering current applied to the Gate.	-
40.	Thyristor Applications	-	Used in power-switching circuits, relay-replacement circuits, inverter circuits, oscillator circuits	-
41.	Transistor Applications	-	they are being used in various oscillators, modulators, detectors	-
42.	Pinch off voltage	-	Voltage at which the channel is pinched off, (i.e) all the free charges from the channel get removed.	-
43.	Saturation Region	-	Both the collector and emitter functions are forward biased	-
44.	Cutoff Region	-	Collector and emitter functions are both reverse biased	-
45.	Advantages of UJT	-	Low cost. Negative resistance characteristics. Requires low value of triggering current.	-
46.	Application of IGBT	-	It is used as switching devices for motor drive systems, uninterruptible power supplies .	-
47.	Active Region	-	Base terminal function in reverse direction and emitter function in forward direction.	-
48.	NPN Transistor	-	In NPN transistor, the direction of movement of an electron is from the emitter to collector.	-
49.	AC Converter	-	solid-state AC-to-AC converter converts an AC waveform to another AC waveform	-
50.	Turn-on time	$T_{ON} = T_D + T_R$	Time required for the current to rise from 0 to 90 percentage of the maximum value	Sec
Unit-III : Amplifiers				
51.	Amplifier	-	Amplifier is a circuit which is used to	-

			increase the magnitude of the signal applied to its input.	
52.	CE configuration	-	The configuration in which the emitter is connected between the collector and base.	-
53.	CC configuration	-	The configuration in which the collector is common between emitter and base is known as CC configuration.	-
54.	Bandwidth	-	The difference between f_1 and f_2. f_2 - high frequency region, f_1 - low frequency region.	-
55.	Power transistors	-	Handle a large amount of current and also dissipates large amount of power across collector base junction	-
56.	Lower cut-off frequency	-	Frequency at which the voltage gain of the amplifier is exactly 70.0% of the maximum gain	-
57.	Source follower	-	In electronics, a common-drain amplifier, also known as a source follower,	-
58.	Upper cut-off frequency	-	Frequency at which the voltage gain of the amplifier is exactly 70.0% of the maximum gain	-
59.	Voltage follower	-	The input signal is coupled to the output circuit without making any distortion.	-
60.	Gain	-	Gain is defined as the ratio of the output power to the input power in dB	-
61.	Hybrid parameters	-	Any linear circuit having input and output terminals can be analyzed by four parameters called hybrid or h-parameters.	-
62.	Relation between α and β	-	$\alpha = \beta/(1+\beta)$	-
63.	CEO	-	collector to emitter base open	-
64.	AC current gain	-	The ratio of change of collector current to the ratio of change of base current is called ac current gain	-

65.	The range of β is	-	20 to 500	-
66.	In a transistor I_E	-	$I_E = I_C + I_B$	-
67.	In a transistor, signal is transferred from	-	Low resistance to high resistance.	-
68.	Small Signal Diode	-	The semiconductor Signal Diode is a small non-linear semiconductor devices generally used in electronic circuits.	-
69.	Active Region	-	It is defined in which transistor function is biased in reverse direction and emitter function in forward direction.	-
70.	Cutoff Region	-	The region in which the collector and emitter functions are both reverse biased	-
71.	Saturation Region	-	The region in which both the collector and emitter functions are forward biased.	-
72.	Types of configuration in transistors	-	Common Base, Common Emitter and Common Collector configurations.	-
73.	Common-Base Biasing	-	input = V_{EB} & I_E output = V_{CB} & I_C	-
74.	Common-Emitter Biasing	-	input = V_{BE} & I_B output = V_{CE} & I_C	-
75.	Common-Collector Biasing	-	input = V_{BC}& I_B output = V_{EC} & I_E	-
Unit-IV : Multistage Amplifiers and Differential Amplifier				
76.	BIMOS	-	BI-polar Metal-Oxide Semiconductor	-
77.	Amplifier	-	Used to increase the amplitude of the input current or voltage at the output.	-
78.	Tuned amplifiers	-	Amplifiers which amplify only selected range of frequencies with the help of tuned circuits.	-
79.	Cascade amplifier	-	Two-port network constructed from a series of amplifiers.	-
80.	Differential Amplifier	-	It yields an output voltage which is proportional to the difference between the	-

			inverting and the non-inverting input signals.	
81.	Uses of Differential Amplifier	-	Used as an automatic gain control circuit.	-
82.	CMRR	-	Common Mode Rejection Ratio CMRR = 20log |Ad/Ac| dB.	-
83.	Common mode	-	The common mode refers to signals or noise that flow in the same direction in a pair of lines.	-
84.	Common Mode Rejection Ratio	CMRR	$\frac{\text{Gain of the amplifier for a difference mode input signal}}{\text{Gain of the amplifier for a common mode input signal}}$	-
85.	FET input stages	-	The input voltage ranges from about −0.2 V to 1 V, the PNP differential amplifier is active and the NPN differential amplifier is cut off	-
86.	single tuned amplifiers	-	Circuit with a single tuner section being at the collector of the amplifier circuit.	-
87.	frequency affect gain	-	The capacitor reactance decreases with increase in frequency bypassing the majority of output.	-
88.	Double tuned amplifiers	-	Use two inductively coupled tuned circuits per stage, both the tuned circuits being tuned to the same frequency	-
89.	Neutralization	-	Technique used for the elimination of potential oscillations	-
90.	Types of qualitative analysis	-	Content analysis, Narrative analysis, Discourse analysis, Framework analysis, Grounded theory.	-
91.	Types of power amplifier	-	1. Class A 2. Class B 3. Class AB 4. Class C 5. Class D to T	-
92.	Class-A	$\theta = 2\pi$	Full cycle 360^o of Conduction	-
93.	Class-B	$\theta = \pi$	Half cycle 180^o of Conduction	-

94.	Class-AB	$\pi < \theta < 2\pi$	Slightly more than 180^o of conduction	-
95.	Class-C	$\theta < \pi$	Slightly less than 180^o of conduction	-
96.	Class-D to T	$\theta = 0$	ON-OFF non-linear switching	-
97.	Qualitative method	-	Qualitative methods are exploratory; they seek to unearth the opinions, thoughts and feelings of respondents.	-
98.	Most efficient power amplifier	-	Class D amplifier is the highest power efficient amplifier.	-
99.	Small signal amplifier	-	When the input is so weak as to produce small fluctuation in the collector current compared to its quiescent value	-
100.	Power Amplifiers	-	It is an electronic amplifier that amplifies low-power electronic audio signals	-
Unit-V : Feedback Amplifiers and Oscillators				
101.	Feedback	-	Portion of the output signal is taken from the output of the amplifier and is combined with the normal input signal.	-
102.	Positive feedback	-	When input signal and part of the output signal are in phase	-
103.	Negative feedback	-	When input signal and part of the output signal are in out of phase	-
104.	Oscillators	-	An oscillator is a circuit which produces a continuous, repeated, alternating waveform without any input.	-
105.	Crystal oscillators	-	Frequency of oscillations depends on the dimensions of crystal	-
106.	LC oscillators	-	Frequency of oscillations is dependent on values of L and C	-
107.	RC oscillators	-	Frequency of oscillations is dependent on values of R and C used at low and medium frequencies	-
108.	Q factor	-	Q=2π *(Maximum Energy Stored per cycle / Energy dissipated per cycle)	-

109.	Conversion efficiency	ŋ	Ratio of the AC output power delivered to the load to DC input power applied	-
110.	Applications of oscillators.	-	AM and FM transmitters. In phase lock loops.	-
111.	Gain of an amplifier with feedback	-	Avf = AV/ 1+ AV β	-
112.	Frequency sensitive arms	-	The arms which decide the frequency of oscillations i.e., R1-C1 and R2-C2 are the frequency sensitive arms.	-
113.	Hartley oscillator - Advantages:	-	a) It is easy to tune b) It is easy to change the frequency by means of a variable	-
114.	Hartley oscillator - Disadvantages:	-	Poor frequency stability	-
115.	Crystal Oscillator	-	Frequency of oscillations depends on the dimensions of crystal	-
116.	Phase shift oscillator - Frequency of oscillations	-	f = 1 / 2π 6RC	Hz
117.	Wein bridge oscillator - Frequency of oscillations	-	f = 1 / 2πRC	Hz
118.	Phase shift oscillator - Value of β	-	β = -1/29 for oscillator using OP-AMP	-
119.	Wein bridge oscillator - Value of β	-	β = + 1/3 for oscillator using OPAMP	-
120.	Phase shift oscillator - Minimum value of gain	-	A>29 for sustained oscillations	-
121.	Wein bridge oscillator - minimum value of gain	-	A> 3 for sustained oscillations	-
122.	Applications: Crystal Oscillator	-	As a crystal clock in microprocessors. In the frequency synthesizers.	-
123.	Barkhausen criterion	-	A β = 1.	-

124.	Closed loop gain	-	Ratio of the output to input, considering the overall effect of the feedback.	-
125.	Open loop gain	-	Ratio of output to input when no feedback	-
Placement Questions				
126.	Tell me a little about yourself.			
127.	What are your biggest weaknesses?			
128.	What are your biggest strengths?			
129.	Where do you see yourself in five years?			
130.	Out of all the other candidates, why should we hire you?			
131.	How did you learn about the opening?			
132.	Why do you want this job?			
133.	What do you consider to be your biggest professional achievement?			
134.	Describe your dream job			
135.	Why do you want to leave your current job?			
136.	What kind of work environment do you like best?			
137.	Tell me the toughest decision you had to make in the last 6 months			
138.	What is your leadership style?			
139.	Tell me about a time you disagreed with a decision. What did you do?			
140.	Tell me how you think other people would describe you.			
141.	What can we expect from you in your first three months?			
142.	What do you like to do outside of work?			
143.	What was your salary in your last job?			
144.	What questions do you have for me?			
145.	What is your greatest professional achievement?			
146.	Can you explain why you changed career paths?			
147.	How do you deal with pressure or stressful situations?			
148.	What do you like to do outside of work?			
149.	Are you willing to relocate?			
150.	What is your biggest regret and why?			

Faculty Team Prepared **Signatures**

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