



# INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Dundigal, Hyderabad - 500 043

## ELECTRICAL AND ELECTRONICS ENGINEERING

### ASSIGNMENT

<b>Course Name</b>	:	ELECTRONIC CIRCUITS
<b>Course Code</b>	:	A40413
<b>Class</b>	:	II B.TECH-II SEM
<b>Branch</b>	:	EEE
<b>Year</b>	:	2016-2017
<b>Course Faculty</b>	:	Ms Anusha N, Assistant Professor

#### OBJECTIVE:

Electrical circuits play a significant role in day to day life of entire mankind. This course deals with the concept of different types of amplifiers, oscillators, vibrators, clippers, clampers, switching characteristics of various semiconductor devices, linear wave shaping and frequency response of bipolar junction transistor and field effect transistor.

S.No	QUESTION	BLOOMS TAXONOMY LEVEL	COURSE OUTCOME
<b>ASSIGNMENT - I</b>			
<b>UNIT-I</b>			
<b>SINGLE STAGE AMPLIFIERS DESIGN AND ANALYSIS &amp; FEEDBACK AMPLIFIERS</b>			
<b>SHORT ANSWER TYPE QUESTIONS</b>			
1	Define an Amplifier?	Remembering	1
2	Describe the single stage amplifier?	Remembering	1
3	Write the advantages of CE configuration over CB and CC	Applying	1
4	Classify the amplifiers based on different parameters?	Understanding	1
5	Distinguish among three configurations?	Understanding	1
6	Write the advantages of FET over BJT?	Applying	2
7	Arrange the hybrid equivalent model of a CE amplifier?	Remembering	1
8	Discuss a small signal JFET model of a common drain amplifier.	Understanding	2
9	Define various hybrid parameters of a Transistor?	Remembering	1
10	List out the characteristics of Common Emitter amplifier?	Remembering	7
<b>LONG ANSWER QUESTIONS</b>			
1	Evaluate the equations for voltage gain, current gain, input impedance and output impedance for a BJT using low frequency h-parameter model for CE configuration.	Evaluating	1
2	State millers theorems. Explain its significance in transistor circuit analysis	Remembering	1
3	Analyze general transistor amplifier circuit using h-parameter model. Derive the expression for $A_i, A_v, R_i, R_o, A_{is}, A_{vs}$	Analyzing	1

4	Explain voltage shunt feedback amplifiers & current series feedback amplifiers?	Understanding	1
5	Sketch the block diagram of a feedback amplifier and derive the expressions for gain (1) with positive feedback and (2) with negative feedback. State the advantages of negative feedback.	Applying	1
6	Estimate the values of open loop Gain A and feedback ratio. For the given data iii) An amplifier, with feedback, has voltage gain of 100. When the gain without feedback changes by 20% and the gain with feedback should not vary more than 2%.	Understanding	1
7	Explain the relevant information, how the negative feedback improves stability reduce noise and Increase input impedance?	Understanding	1
8	Design the circuit diagram of CS amplifier. With the help of small signal model, derive the expressions for input impedance, output impedance and voltage gain.	Creating	1
9	(a) Write short notes on miller's theorem. (b) Analyze a single stage transistor amplifier using h-parameters	Applying	1
10	Sketch the circuit diagram of CE amplifier with emitter resistance. Draw its approximate h-parameter model and derive the expression for AI, RI and AV.	Applying	1

#### ASSIGNMENT - II

### UNIT-II BJT & FET FREQUENCY RESPONSE SHORT ANSWER TYPE QUESTIONS

1	Explain the significance of logarithmic scale?	Understanding	3
2	Define "bel" and "Decibel"?	Remembering	3
3	Sketch the high frequency $\pi$ model of a transistor and explain in brief.	Applying	3
4	Define $f_{\alpha}$ and $f_{\beta}$ cut-off frequencies in Hybrid- $\pi$ model.	Remembering	3
5	Define square wave testing? What is need for it?	Remembering	3
6	Discuss the effect of coupling capacitors on low frequency	Understanding	3
7	Write short notes on miller's theorem.	Creating	3
8	Describe how internal capacitances affect the gain of BJT	Evaluating	3
9	Define voltage gain of the amplifier at $f_T$ ?	Remembering	3
10	Discuss the internal BJT capacitances and explain their effects.	Understanding	3

#### LONG ANSWER QUESTIONS

1	Evaluate the expressions for $f_{\beta}$ and $f_T$ .	Evaluating	3
2	Discuss the effect of coupling capacitor ( $C_c$ ) on low frequency response of CE amplifier.	Understanding	3
3	Sketch the low frequency small signal model of a transistor in CB and CE configurations and explain significance of each model.	Applying	3
4	Sketch the small-signal high-frequency circuit of a CS amplifier and derive the expression for the voltage gain.	Applying	3
5	Show that (i) $h_{fe} = g_m r_{b'e}$ for a Hybrid $\pi$ model of CE amplifier.	Applying	3
6	Explain how does a $C_e$ and $C_c$ vary with $ I_c $ and $ V_{CE} $ .	Understanding	3
7	Explain how does $g_m$ vary with $ I_c $ and $ V_{CE} $ , T.	Understanding	3
8	Evaluate the expression for current gain with resistive load.	Evaluating	3
9	Justify why the gain of the amplifier decreases in the low frequency and high frequency range?	Evaluating	3

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