

ELECTRONIC CIRCUITS ANALYSIS & DESIGN

(Common to ECE & EIE)

Time: 3 hours

Max. Marks: 70

PART – A

(Compulsory question)

- 1 Answer the following: (10 X 02 = 20 Marks)
- Voltage gain of a single stage amplifier is 30. Bandwidth is 20 kHz. Two such stages are cascaded. Find the overall voltage gain and bandwidth.
 - List out the advantages and disadvantages of RC coupled amplifier.
 - Draw the frequency response of RC coupled amplifier and indicate bandwidth, low, mid and high frequency ranges.
 - A multistage amplifier is to be constructed using four identical stages, each of which has a lower cutoff frequency 15 Hz and upper cutoff frequency 30 kHz. What will be the lower and upper cutoff frequency of the multistage amplifier?
 - Draw the equivalent circuit of transconductance amplifier.
 - An amplifier has a gain of 300, when the -ve feedback is applied gain is reduced to 240. Find feedback factor.
 - Differentiate between power amplifier and voltage amplifier.
 - What are the advantages of push pull amplifier configuration?
 - List out the advantages of tuned circuit.
 - Distinguish between single tuned and double tuned amplifiers.

PART – B

(Answer all five units, 5 X 10 = 50 Marks)

UNIT – I

- Explain the effect of cascading of amplifiers on bandwidth.
 - Compare various coupling schemes used in amplifiers.
- (OR)
- Give the analysis of transformer coupled amplifier in mid band region.
 - Derive the expression for voltage gain and current gain of cascade amplifier.

UNIT – II

- Draw the small signal simplified hybrid equivalent circuit of an CE amplifier and discuss the effect of bypass capacitor on the frequency response of an amplifier.
- Determine the low frequency response of CE amplifier using the following specifications:

$V_{CC} = 10 V$	$R_C = 2.2 K\Omega$	$R_E = 1 K\Omega$
$R_1 = 62 K\Omega$	$R_2 = 22 K\Omega$	$R_S = 600 \Omega$
$C_B = 0.1 \mu f$	$C_E = 10 \mu f$	$C_C = 0.1 \mu f$
$h_{ie} = 1.6 K\Omega$	$h_{fe} = 99.$	

(OR)

- Draw the hybrid – π model for a transistor in CE configuration and explain the significance of each component in the model.
- Explain the variation of hybrid parameters with increasing $|I_C|$, $|V_{CE}|$ and temperature.

UNIT – III

- What is the effect of -ve feedback on the input impedance of an amplifier?
- Derive the expression for frequency of oscillations of RC phase shift oscillator.

(OR)

- State and explain Barkhausen's criteria.
- Explain the working of Hartley oscillator. Also derive the expression for its frequency of oscillations.

UNIT – IV

- Show the conversion efficiency of transformer coupled class A amplifier is 50%.
- Explain the operations of class B push pull amplifier.

(OR)

- Explain ideal and practical performance of class-D amplifier.
- What is cross over distortion? Explain how it can be eliminated.

UNIT – V

- Explain the operation of a single tuned capacitive coupled amplifier and derive the expression for bandwidth.

(OR)

- Define resonant frequency and derive an expression for the impedance of tuned circuit.
- What are the limitations of single tuned amplifiers?